

## 2023 Stroke Registry Data Summary



Figure 1: The Great Seal of the State of Nevada

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## Background and Purpose

A stroke occurs when the blood supply to the brain becomes blocked by a blood clot (ischemic stroke) or when a blood vessel ruptures (hemorrhagic stroke), causing brain cells to die and leading to functional impairment. Stroke is a leading cause of disability and death nationally and in Nevada.<sup>1</sup>

In 2015, the 78<sup>th</sup> Nevada Legislature enacted [Nevada Revised Statutes \(NRS\) 439.5291](#) through [NRS 439.5297](#), requiring the Nevada Division of Public and Behavioral Health (DPBH) to develop an annual report concerning the operation and use of the Stroke Registry and the data collected. The resulting report is the "Nevada Stroke Registry Data Summary Report." [NRS 439.5295](#) mandates the establishment and maintenance of the Stroke Registry to compile information and statistics to align with the consensus measures prescribed by the Paul Coverdell National Acute Stroke Act Registry of the Centers for Disease Control and Prevention (CDC), the Department of Health and Human Services, the Joint Commission, the American Heart Association (AHA), and the American Stroke Association (ASA). In compliance, the DPBH adopted the *Get With The Guidelines-Stroke* (GWTG-S) data management platform established by the AHA/ASA as Nevada's Stroke Registry database. The Cardiovascular Health (CVH) Program maintains super-user access to the GWTG-S database to facilitate annual stroke data compilation, analysis, and reporting.

[NRS 439.5297](#) further describes the duty of DPBH to establish and maintain a Stroke Registry, encourage, and facilitate information, conduct data analysis and sharing, and adopt and carry out procedures to utilize the data to analyze the response to and treatment of strokes in Nevada. As part of the annual report, DPBH uses data analysis to identify potential solutions for the treatment of stroke and to make recommendations designed to improve the quality of care provided to Nevadans.

DPBH utilizes the Stroke Registry data to drive collaborative promotion and implementation of evidence-based best practices, standards, and continuous quality improvements along the entire stroke care continuum<sup>2</sup> including community awareness, Emergency Medical Services, Emergency Department, In-patient care, discharge coordination, and home and community supports to benefit all Nevadans.

## Stroke Impact

A stroke or "brain attack" is a medical emergency requiring immediate responsiveness. Like a heart attack, every minute between the onset of symptoms and therapeutic intervention impacts outcomes.<sup>1</sup>

In 2023, stroke was the fifth leading cause of death in Nevada and the fourth leading cause of death in the United States (U.S.). Stroke is the leading cause of severe long-term disability in the U.S. and Nevada.<sup>1</sup> Strokes significantly impact survivors, caregivers, families, communities, and health care systems. In the U.S., based on historical medical expenditures surveyed, adjusted annual direct costs for a stroke participant were \$4,317 greater than for a non-stroke participant, resulting in a net yearly expenditure of \$38 billion nationally and \$65.5

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<sup>1</sup> CDC. About Stroke | cdc.gov. Centers for Disease Control and Prevention. Published May 4, 2022. Accessed October 4, 2022

<sup>2</sup> About the Paul Coverdell National Acute Stroke Program|Programs|DHDSPI|CDC. www.cdc.gov. Published November 28, 2018. [https://www.cdc.gov/dhdsp/programs/about\\_pcnasp.htm](https://www.cdc.gov/dhdsp/programs/about_pcnasp.htm)

billion of indirect costs expended for un/under-employment and premature mortality result in the aggregate expenditure of \$103.5 billion annually in 2016 U.S.-dollar values.<sup>3</sup>

After decades of decline, progress has slowed in preventing stroke deaths. Almost 800,000 people have a stroke each year; of those, 200,000 people will have had a previous stroke, and more than 140,000 people will die. According to the CDC National Center for Health Statistics in Nevada, there were an estimated 1,445 deaths from stroke in 2022. These numbers are alarming, as approximately 80 percent of strokes are preventable.

While prevention and early treatment of strokes receive significant attention, it is equally important to focus on stroke aftercare, recurrence prevention, and support for caregivers and families. Improved stroke survival results in a more significant burden on caregivers, family, and the community, often in the form of uncompensated care, as survivors navigate a challenging and complex rehabilitation journey and pathway to “finding a new normal.”

The figures in the section below present all statutorily required data and the data source is GWTG-S. In the following figures one (1) through nine (9), “United States (U.S.)” reflects the 3,241 certified stroke hospitals that report into GWTG-S database nationally while “Nevada” represents the sixteen (16) certified stroke hospitals in Nevada.

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<sup>3</sup> Girotra T, Lekoubou A, Bishu KG, Ovbiagele B. A contemporary and comprehensive analysis of the costs of stroke in the United States. *Journal of the Neurological Sciences*. 2020; 410:116643. Doi: 10.1016/j.jns.2019.116643

### Stroke Report Data

Figure 1. Advance Notification by Emergency Medical Services (EMS) or Mobile Stroke Unit (MSU)

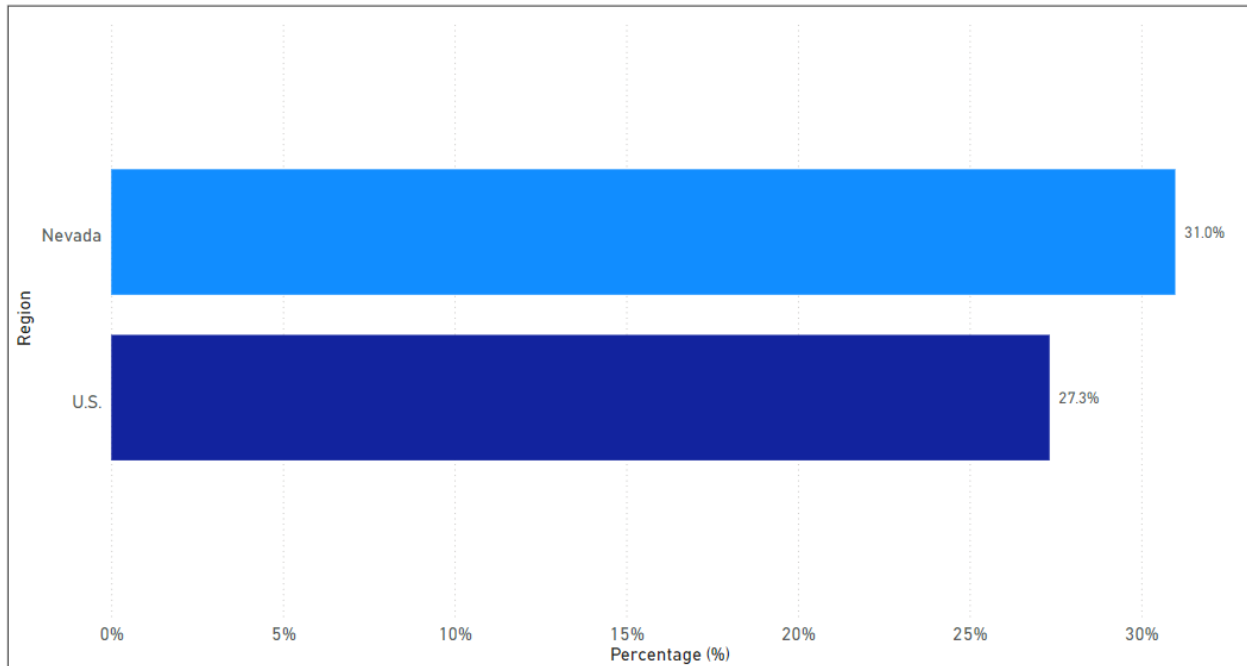


Figure 1 assesses the percentage of advanced notifications provided by EMS or MSU. The percentage of advanced notification in Nevada (31.0%) is higher than the national average (27.3%), indicating effective pre-hospital coordination and preparedness in the state (data source: GWTC-S).

Figure 2. Arrival Mode

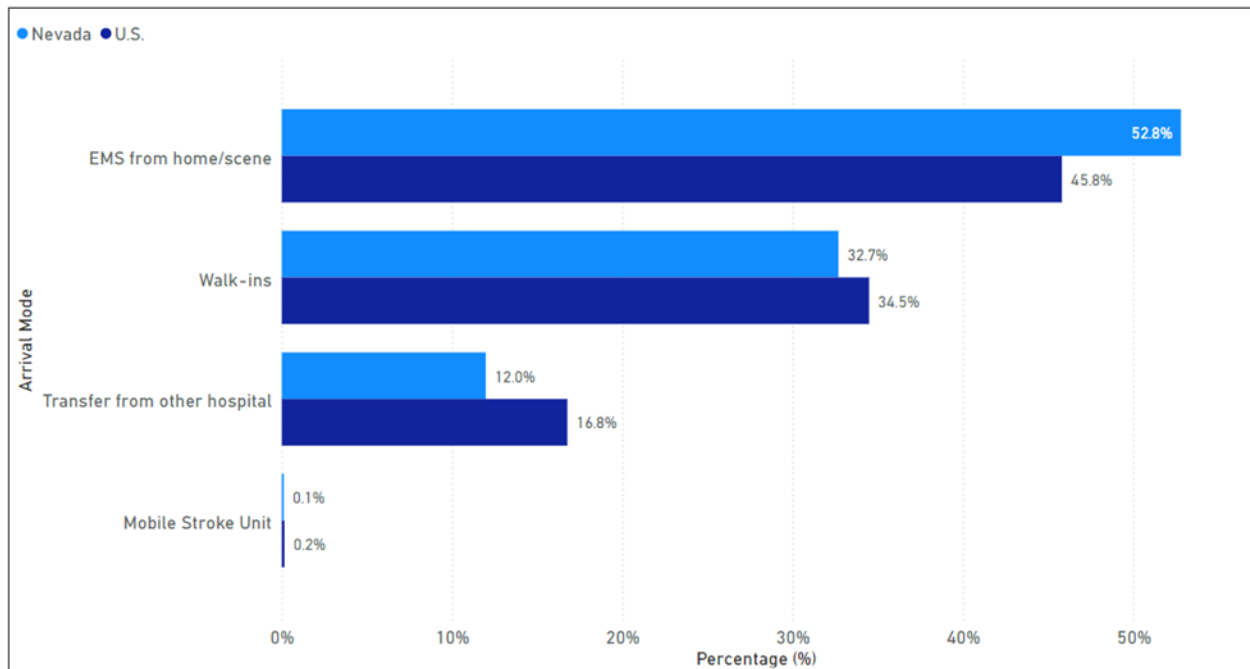


Figure 2 represents the various pathways through which a stroke patient arrives at a hospital, including EMS from home/scene, walk-ins, transfers from other hospitals, and the MSU. EMS from home/scene is the most common arrival mode, with a higher percentage in Nevada (52.8%) compared to the nation (45.8%) (data source: GWTC-S).

Figure 3. Arrival to Thrombolytics

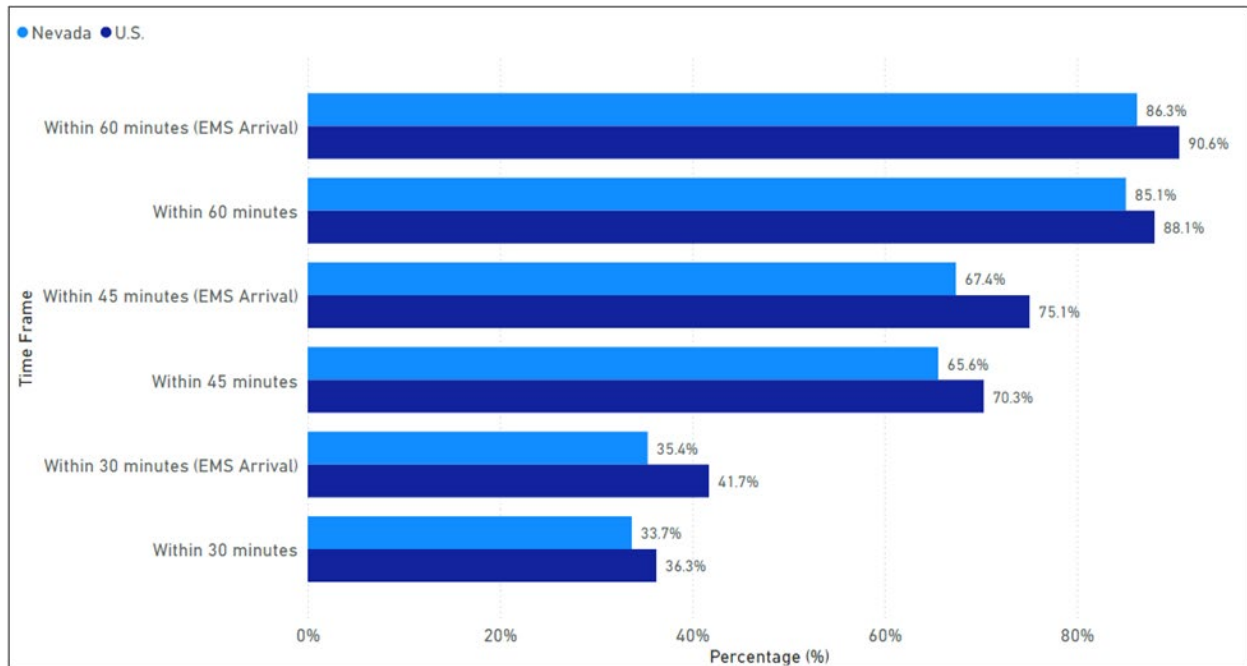


Figure 3 measures the percentage of patients who received thrombolytics within 30, 45, and 60 minutes of arrival at the hospital. 33.7 percent of patients received treatment within 30 minutes compared to 36.3 percent nationally, 65.6 percent within 45 minutes compared to 70.3 percent nationally, and 85.1 percent within 60 minutes compared to 88.1 percent nationally (data source: GWTC-S).

Figure 4. Door-in, Door Out Within 90 Minutes

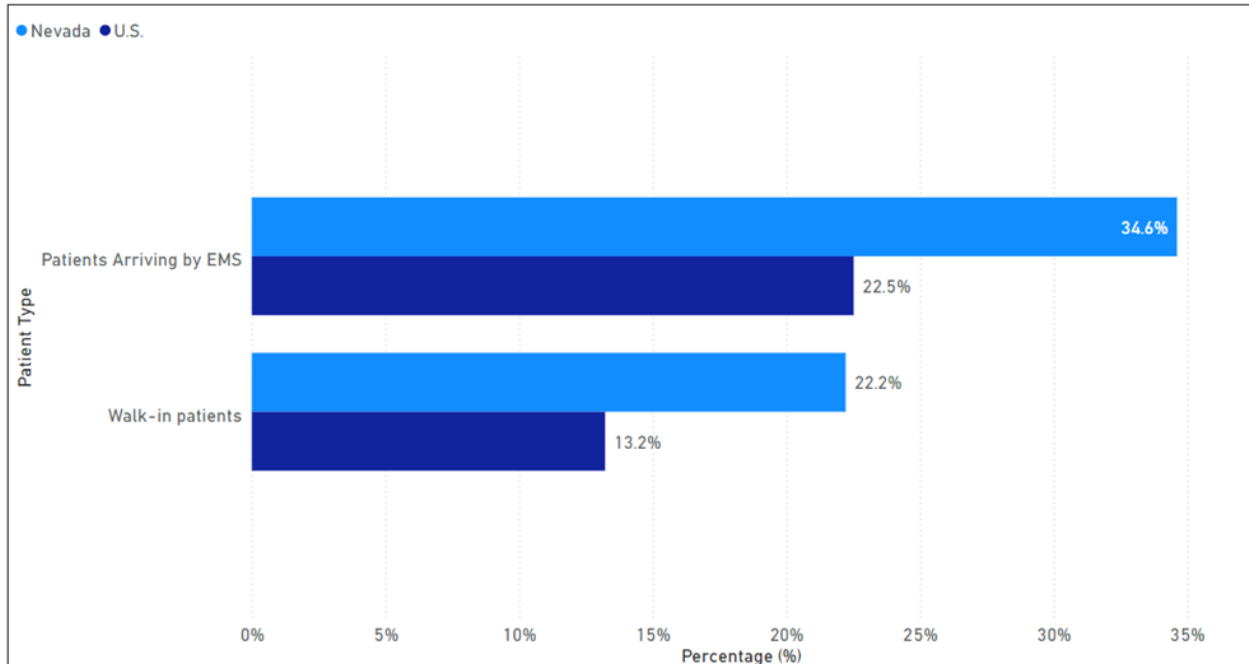


Figure 4 measures the percentage of stroke patients who are admitted to the hospital and discharged within 90 minutes of arrival. Among Nevada, 34.6 percent of patients arriving by EMS met this benchmark compared to 22.5 percent nationally. For walk-in patients, 22.2 percent in Nevada met the benchmark compared to 13.2 percent nationally (data source: GWTG-S)



Figure 5. Ischemic Stroke Treatment

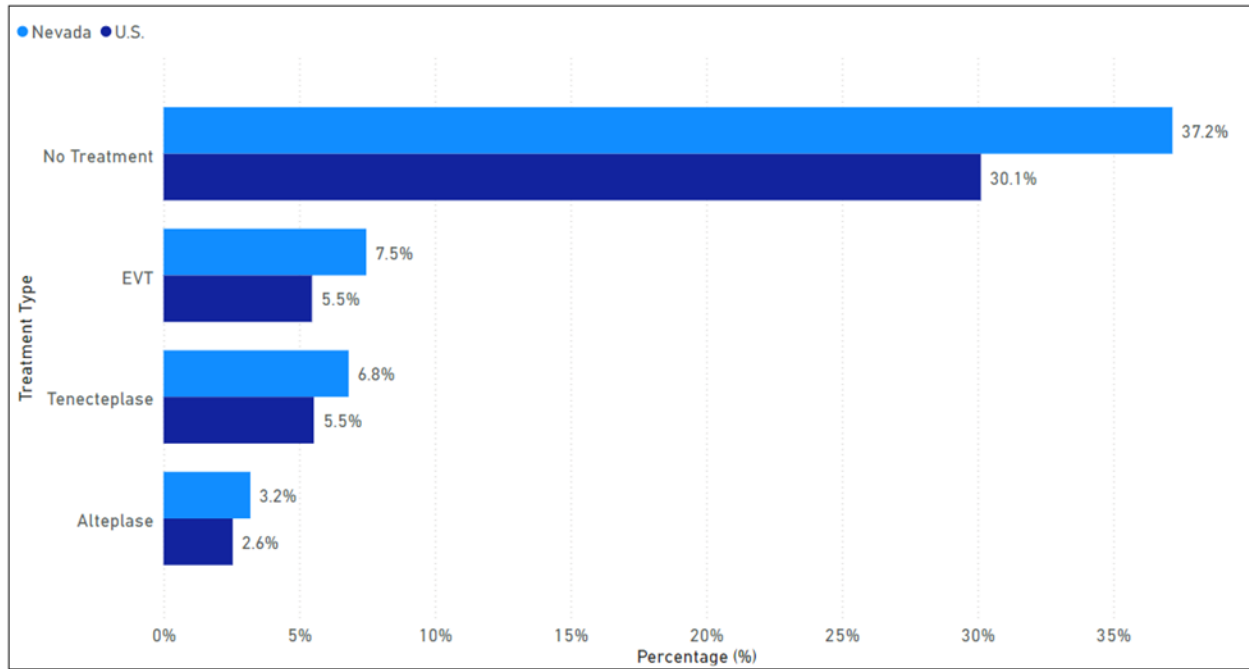


Figure 5 displays the various treatments for ischemic stroke, including Alteplase, Endovascular Therapy (EVT), Tenecteplase, and no treatment. In Nevada, 37.2 percent of stroke patients received no treatment, followed by EVT at 7.5 percent, Tenecteplase at 6.8 percent and Alteplase at 3.2 percent (data source: GWTC-S).

Figure 6. Median Time from Last Known Well

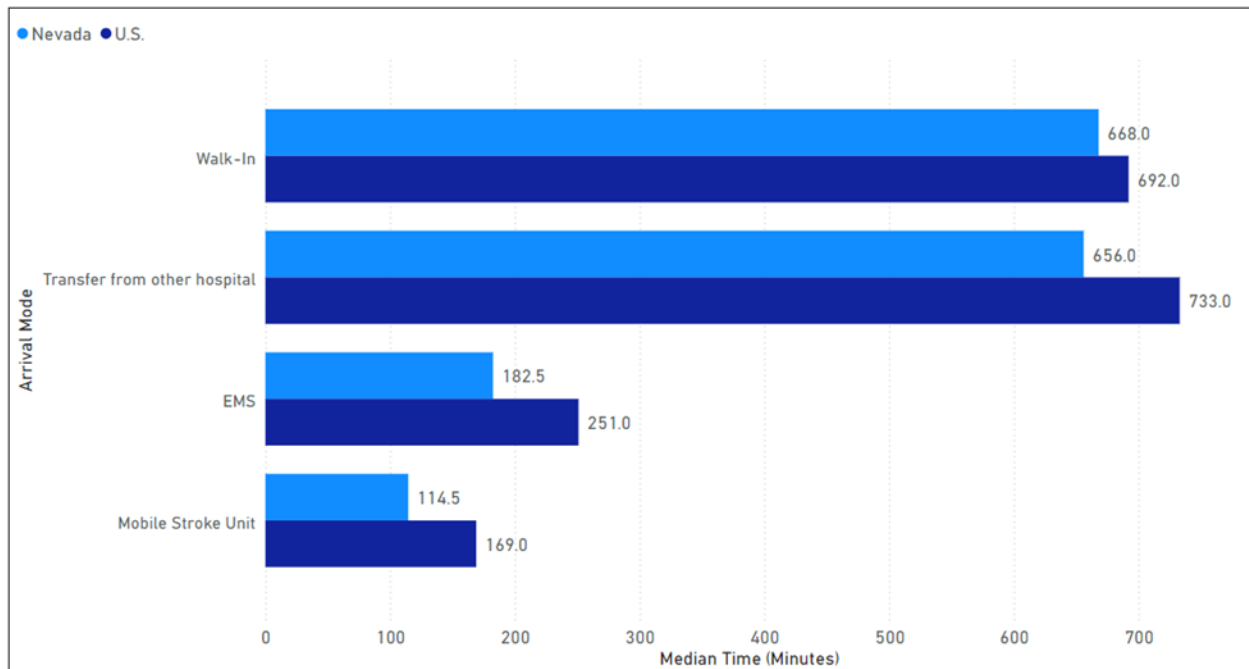


Figure 6 evaluates the median time from Last Known Well (LKW) to hospital arrival for stroke patients. LKW indicates when the patient was last observed without stroke symptoms. The median times in Nevada, ranked from longest to shortest, are walk-ins at 668.0 minutes, transfers from other hospitals at 656.0 minutes, EMS at 182.5 minutes, and MSU at 114.5 minutes (data source: GWTG-S).

Figure 7. Patient Demographics (Median Age)

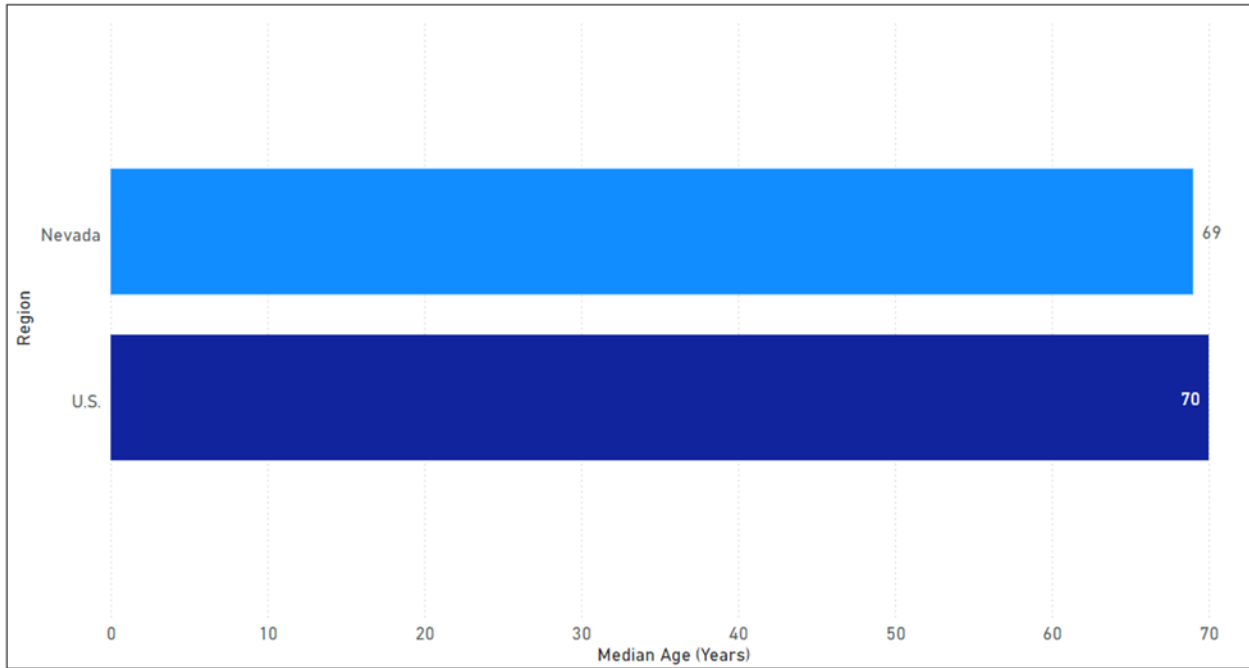


Figure 7 displays the median age of stroke patients, which is 69 years in Nevada compared to 70 years nationally (data source: GWTG-S).

Figure 8. Gender

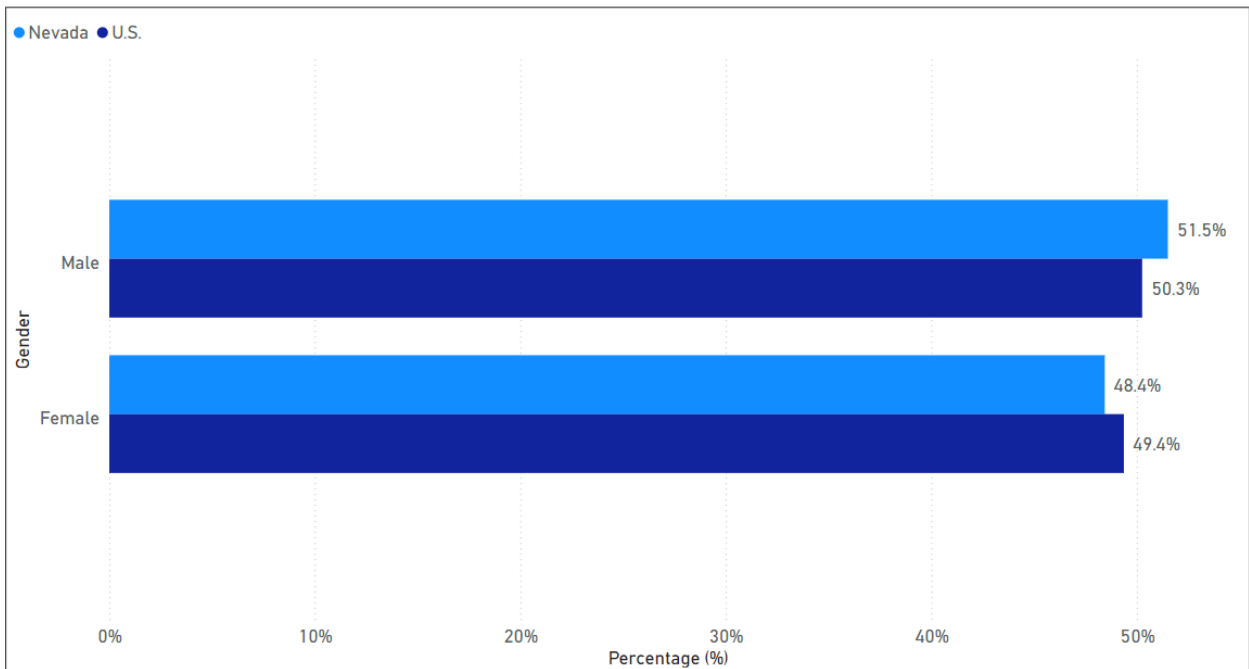


Figure 8 visualizes the gender distribution of stroke patients. In Nevada, 51.5 percent of stroke patients were male, and 49.4 percent were female (data source: GWTG-S).

Figure 9. Race/Ethnicity

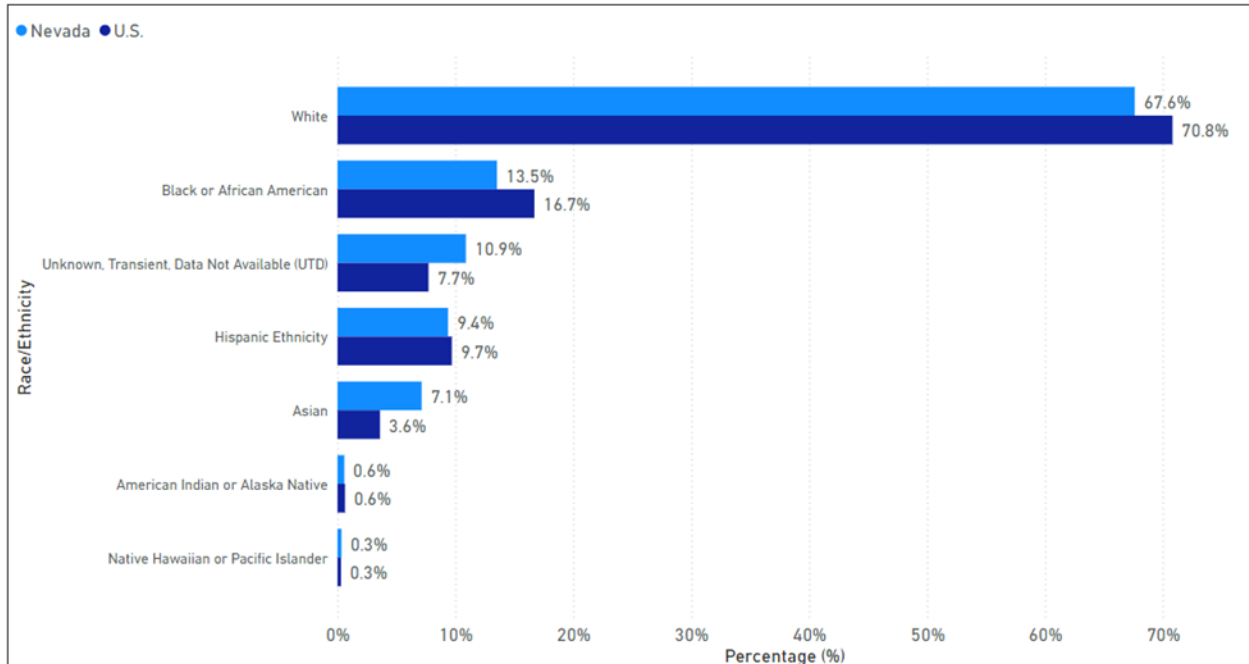


Figure 9 visualizes the distribution of stroke patients by race/ethnicity. The top three (3) group are: 67.6 percent White, 13.5 percent Black or African American, and 10.9 percent with unknown classifications. Hispanic patients followed closely at 9.4 percent of the total (data source: GWTG-S).

### Get With The Guidelines-Stroke Limitations

In 2023, the *Get With The Guidelines*– Stroke (GWTG-S) database collected the reporting data exclusively from Nevada's 16 Joint Commission-accredited Certified Stroke Centers (CSCs) in Carson City, Clark, and Washoe counties, serving approximately 90 percent of Nevada's population. GWTG-S does not collect data from the remaining 12 acute care hospitals or any of Nevada's 13 critical access hospitals serving Nevada's rural and frontier populations.<sup>4</sup> The substantial effort required to become a GWTG-S participant precludes some hospitals that may decline participation due to adult stroke care being outside of their clinical focus, or for economic, workforce, or competitive reasons. Additionally, high-volume stroke centers reporting into the GWTG-S database may report a sampled stroke sub-population rather than all cases individually. For example, a CSC treating 225 or more

<sup>4</sup> Find Hospitals. Nvhospitalquality.net. Published 2022. Accessed October 24, 2022. <https://nvhospitalquality.net/hospitals>

stroke patients per quarter may report a sample size of only 45 patients per quarter.<sup>5</sup> The identified limitations of the GWTC-S data result in the inability to draw comparisons between CSCs or to generalize data to represent the State of Nevada.

The Cardiovascular Health (CVH) program analyzed all available data about stroke care in Nevada in response to the significant limitations and challenges. The analysis identified existing, valid, and reliable data, including the self-reported Behavioral Risk Factor Surveillance System (BRFSS), Nevada hospital billing data, and the Nevada death registry system. The CVH program elected to examine Nevada's accredited stroke centers' voluntarily reported Coverdell Act performance measures data to strengthen the report. Including these data allowed further insights incorporated into the *Response to and Treatment of Stroke in Nevada* section of the report.

Nevada Hospitals Participating with GWTC-S Database and Address	
Carson Tahoe Health- 2874 N Carson St Ste 215, Carson City, NV 89703	Southern Hills Hospital Medical Center 9300 W Sunset Rd, Las Vegas, NV 89148
Centennial Hills Hospital Medical Center 6900 North Durango Dr, Las Vegas, NV 89149	Spring Valley Hospital Medical Center 5400 S Rainbow Blvd, Las Vegas, NV 89118
Desert Springs Hospital Medical Center 2075 E Flamingo Rd, Las Vegas, NV 89119	St Rose Dominican Hospital San Martin Campus - 8280 W Warm Springs Rd, Las Vegas, NV 89113
Henderson Hospital- 1050 W Galleria Dr, Henderson, NV 89011	St Rose Dominican Hospital – Siena Campus 3001 Saint Rose Pkwy, Henderson, NV 89052
Mountain View Hospital - 3100 N Tenaya Way, Las Vegas, NV 89128	Summerlin Hospital Medical Center 657 N Town Center Dr, Las Vegas, NV 89144
Northern Nevada Medical Center 2375 E Prater Way, Sparks, NV 89434	Sunrise Hospital and Medical Center 3186 S Maryland Pkwy, Las Vegas, NV 89109
Renown Regional Medical Center 1155 Mill St, Reno, NV 89502	University Medical Center of Southern Nevada - 1800 W Charleston Blvd, Las Vegas, NV 89102

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<sup>5</sup> The Joint Commission. "Specifications Manual for Joint Commission National Quality Measures (V2022B)." [Manual.jointcommission.org](https://www.jointcommission.org/manual/jointcommission.org), 2022, [manual.jointcommission.org/releases/TJC2022B/Stroke.html](https://www.jointcommission.org/releases/TJC2022B/Stroke.html). Accessed October 4, 2022.

St Mary's Regional Medical Center 235 W 6 <sup>th</sup> St. Reno, NV 89503	Valley Hospital Medical Center 620 Shadow Ln, Las Vegas, NV 89106

## Risk Factors for Stroke

Stroke is one of the most preventable of all life-threatening health problems. Risk factors for stroke are either non-modifiable or modifiable through awareness, lifestyle change, or medical treatment.<sup>6</sup>

### *Non-Modifiable Risk factors*

There are several factors' people can control to modify their stroke risk effectively. Uncontrolled high blood pressure is the leading cause of stroke, heart attack, heart failure, dementia, and kidney disease and the most important controllable risk modifier.<sup>7</sup> Other factors include:

- High cholesterol, directly and indirectly, increases the risk of a stroke through atherosclerosis (hardening of the arteries) – also a risk factor in coronary artery disease.<sup>8</sup>
- Atrial fibrillation/flutter (AF) increases stroke risk factors by fivefold. Anticoagulants reduce the AF risk factors by up to 70 percent.<sup>8</sup>
- The nicotine and carbon monoxide that enters the bloodstream when smoking and vaping damages blood vessels and speed atherosclerosis increasing blood pressure and the heart's workload.<sup>9</sup>
- Diabetes mellitus (DM) plays a significant role in ischemic strokes – Currently, DM is associated with 67 percent of all strokes.<sup>12</sup>
- Diet is a leading predictor and modifier of long-term cardiovascular, brain, and metabolic health. Too much saturated and trans-fats raise blood cholesterol levels. Excess salt can increase blood pressure, and high caloric intake can lead to obesity.<sup>11</sup>
- Excess weight, poor diet, and a sedentary lifestyle (frequently co-occurring) put undue strain on the entire circulatory system, thus increasing stroke risks.<sup>10</sup>

<sup>6</sup> CDC/National Center for Health Statistics. Nevada. [www.cdc.gov](http://www.cdc.gov). Published May 19, 2020. Accessed October 7, 2022

<sup>7</sup> American Heart Association. Health Threats From High Blood Pressure. [www.heart.org](http://www.heart.org). Published October 31, 2016. Accessed October 7, 2022. <https://www.heart.org/en/health-topics/high-blood-pressure/health-threats-from-high-blood-pressure>

<sup>8</sup> O'Neill D, Horgan F, Hickey A, McGee H. Long-term outcome of stroke: Stroke is a chronic disease with acute events. *BMJ (Clinical research ed.)*. doi:10.1136/bmj.39500.434086.1F

<sup>9</sup> Parikh NS, et al., Smoking Cessation in Stroke Survivors in the United States: A Nationwide Analysis. *Stroke*. 2022;53(4):1285-1291. doi:10.1161/strokeaha.121.036941

<sup>10</sup> Tsao CW, et al., Heart Disease and Stroke Statistics—2022 Update: A Report From the American Heart Association. *Circulation*. 2022;145(8):e391-e426. doi:10.1161/cir.0000000000001052

- Finally, recognizing and treating transient ischemic attacks (a stroke that lasts only a few minutes) can reduce the risk of a major stroke.<sup>11</sup>

### *Social Determinants of Stroke*

Stroke risk is also predicted and modified by social determinants of health, defined as the conditions and environments where people are born, live, learn, work, play, worship, and age that affects a wide range of health, functioning, and quality of life outcomes and risks.<sup>12</sup> In a meta-analysis of 51 studies, lower socioeconomic status measured by income, occupation, or education was linked to increased stroke risk. Individuals with health literacy challenges have two-fold higher odds of hypertension (95 percent CI, 1.55–2.63) than individuals with higher health literacy. Females, especially those in higher-income countries show stronger associations of stroke risk.<sup>12</sup> There is also significant health disparity between racial and ethnic groups. In Nevada, the stroke is a significantly higher mortality with the Black (Non-Hispanic) population (75 per 100,000) as opposed to other racial and ethnic populations.<sup>13</sup> Adverse working conditions, including job loss and underemployment, are related to increased stroke risk, as are long workhours (>40hr/week). A smaller social network (i.e., contact with fewer family members, friends, and neighbors) was linked to a 44 percent higher risk of stroke over an 18.6-year follow-up, even after controlling for demographics and other relevant risk factors.<sup>1</sup>

### *Risk Reduction*

There are several evidence-based lifestyles-change programs aimed at cardiovascular and stroke risk reduction from which to choose. Among them, the [American Heart Association's Life's Simple 7](#) is a prescription for health using the seven (7) most important predictors of heart health and a pathway to achieve ideal cardiovascular health.<sup>14</sup> and the [American Heart Association's Life's Essential 8™ Your Checklist for Lifelong Good Health](#).<sup>15</sup> These programs, and all evidence-based healthy lifestyle content, address two (2) major areas: purposeful, healthy behaviors and managed biometric factors. All Americans are called upon to quit smoking, be physically active, develop healthy eating patterns, get restorative sleep, and manage (medically, if necessary) body weight, blood glucose, cholesterol, and blood pressure.<sup>8,9,11,15</sup>

<b>American Heart Association's Life's Essential 8™</b>
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<b>EAT BETTER</b>
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<sup>11</sup> CDC. Preventing Stroke Deaths. Centers for Disease Control and Prevention. Published September 6, 2017. Accessed October 4, 2022. <https://www.cdc.gov/vitalsigns/stroke/index.htm>

<sup>12</sup> Office of Disease Prevention and Health Promotion. "Social Determinants of Health." Healthy People 2030, US DHHS Office of Disease Prevention and Health Promotion, 2022, [health.gov/healthypeople/priority-areas/social-determinants-health](https://health.gov/healthypeople/priority-areas/social-determinants-health). Accessed November 18, 2022

<sup>13</sup> Office of Analytics. Department of Health and Human Services. Minority Health Report 2023. Carson City, Nevada e 2.0. April 2023. [Nevada Minority Health Report - 2023 \(nv.gov\)](https://www.nv.gov/Minority-Health-Report-2023)

<sup>14</sup> American Heart Association. Life's Simple 7 – American Heart Association – Workplace Health Playbook. [playbook.heart.org](https://playbook.heart.org/lifes-simple-7/). Published 2019. Accessed October 4, 2022. <https://playbook.heart.org/lifes-simple-7/>

<sup>15</sup> American Heart Association. Life's Essential 8. [www.heart.org](https://www.heart.org/en/healthy-living/healthy-lifestyle/lifes-essential-8). Published 2022. Accessed October 5, 2022. <https://www.heart.org/en/healthy-living/healthy-lifestyle/lifes-essential-8>

Aim for a healthy eating pattern that includes whole foods, lots of fruits and vegetables, lean protein, nuts, and seeds, and cooking in non-tropical oils such as olive and canola.

**MANAGE WEIGHT**

Achieving and maintaining a healthy weight has many benefits. Body mass index (BMI), a numerical value of your weight about your height, is a helpful gauge. The optimal BMI for most adults' ranges from 18.5 to less than 25. You can calculate it online or consult a healthcare professional.

**BE MORE ACTIVE**

Adults should participate in 150 minutes of moderate or 75 minutes of vigorous physical activity per week. Walking is excellent for moderate levels of activity. Kids should have 60 minutes every day, including play and structured activities.

**CONTROL CHOLESTEROL**

High levels of non-HDL, or "bad" cholesterol, can lead to heart disease. Your healthcare professional can consider non-HDL cholesterol as the preferred number to monitor, rather than total cholesterol, because it can be measured without fasting beforehand and is reliably calculated among all people.

**QUIT TOBACCO**

The use of inhaled nicotine delivery products, which includes traditional cigarettes, e-cigarettes, and vaping, is the leading cause of preventable death in the U.S., including about a third of all deaths from heart disease. Moreover, about a third of U.S. children ages 3-11 are exposed to secondhand smoke or vaping.

**MANAGE BLOOD SUGAR**

Most of the food we eat is turned into glucose (or blood sugar) that our bodies use as energy. Over time, high levels of blood sugar can damage your heart, kidneys, eyes, and nerves. As part of testing, monitoring hemoglobin A1c can better reflect long-term control in people with diabetes or prediabetes.

**MANAGE BLOOD PRESSURE**

Keeping your blood pressure within acceptable ranges can keep you healthier for longer. Levels less than 120/80 mm Hg are optimal. High blood pressure is defined as 130-139 mm Hg systolic pressure (the top number in a reading) or 80-89 mm Hg diastolic pressure (bottom number).

**GET HEALTHY SLEEP**

Getting a good night's sleep every night is vital to cardiovascular health. Adults should aim for a nightly average of 7-9 hours, and babies and kids need more depending on their age. Too little or too much sleep is associated with heart disease, studies show.

**Recommendations**

[Nevada Revised Statutes \(NRS\) 439.5291](#) through [NRS 439.5297](#) require the Nevada Division of Public and Behavioral Health (DPBH) to develop an annual report concerning the operation and use of the Stroke Registry and the data collected. This report must also include recommendations for legislation designed to improve the quality of care provided to Nevadans.



After consultation with internal and external partners from the Nevada Statewide Cardiovascular Health Learning Collaborative, the Division has no recommendations for legislation designed to improve the quality of stroke care in Nevada at this time. However, the State will continue to pursue opportunities to improve health disparities including the pursuit of funding such as the Coverdell Stroke Grant to ensure the State of Nevada continues to reduce mortality, morbidity and associated disparities in stroke related hospitalizations and death.

### *Strategies*

Although not a statutory requirement of this report, the following section identifies ongoing funded strategies and identifies the focus for future strategies as reviewed and approved by an advisory group of the statewide Heart Disease and Stroke Prevention Taskforce.

#### DPBH

- Continue to develop the Black-owned Barbershop (BSHOP) and Beauty shop (BeSHOP) health outreach program in Clark County urban core to improve health literacy and address the higher incidence of stroke within the Black population.
- Enhance the Well-Integrated Screening and Evaluation for Women Across the Nation ([WISEWOMAN](#)) program to address cardiovascular health risk factors for low-income and uninsured women.
- Continue to promote the Million Hearts initiative to private sector partners to raise awareness about quality improvements in preventing heart disease and strokes.<sup>17</sup>
- Continue to support the Heart Disease and Stroke Prevention program efforts to expand the Heart Healthy Ambassador Blood Pressure Self-Monitoring program throughout Nevada.
- Continue support for the Nevada statewide cardiovascular health learning collaborative.
- Increase support for collaborations between funded programs within the Division.
- Collaborate with the Division's public information officer to expand public awareness campaigns to promote recognition of heart attacks and strokes and the importance of calling 911.

#### Health Systems

- Use health information technology and electronic health record approaches to identify patients "hiding in plain sight" with undiagnosed or unmanaged heart disease and stroke risk factors.<sup>16</sup>
- Participate in the Nevada statewide cardiovascular health learning collaborative.
- Coordinate with Emergency Medical Service (EMS) care providers to implement coordinated systems of care that get patients to certified stroke centers fast and reduce delays in care transitions.<sup>16</sup>
- Work with community members to raise awareness of stroke and heart attack symptoms and ensure EMS systems are activated quickly. Healthcare Professionals.<sup>17</sup>
- Continue to identify and treat high blood pressure, diabetes, obesity, high cholesterol, smoking, and other stroke risk factors.<sup>16</sup>

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<sup>16</sup> Centers for Disease Control and Prevention. Stroke Facts. Published May 25, 2021. Accessed September 15, 2022. <https://www.cdc.gov/stroke/facts.htm>.

- Continue to refer patients to community lifestyle change resources and programs such as quitting smoking lines, obesity, and diabetes prevention.<sup>16</sup>
- Continue to educate patients to recognize the signs and symptoms of heart attacks and strokes and the importance of calling 911.<sup>16</sup>

#### Every Nevadan

- Learn to recognize the signs and symptoms of a heart attack and stroke and call 911.<sup>16</sup>
- Eat a healthy diet with lots of fruit and vegetables, maintain a healthy weight, and be physically active.
- Manage medical conditions such as obesity, pulmonary disease, diabetes, high cholesterol, and high blood pressure by following medical advice and taking medication as prescribed.<sup>16</sup>
- Avoid smoking, vaping, and secondhand smoke.<sup>16</sup>
- Share this information with a friend, neighbor, or loved one.

The appendix below is the summation of this report and its call to action. Strokes happen wherever Nevadans are born, live, learn, work, play, worship, and age. To enjoy active, productive years of life, know and manage the risk factors. Learn to recognize the signs of a stroke and take action to save lives. To reduce the burden of disability, healthcare systems and professionals can ensure coordinated, well-informed care transitions.

## What's needed to decrease stroke deaths?

### RISK FACTORS FOR STROKE

Knowing and managing your risks for stroke are key.



HIGH BLOOD PRESSURE a leading cause of STROKE



TOBACCO USE



DIABETES



HIGH CHOLESTEROL



OBESITY & PHYSICAL INACTIVITY

## Recognize the signs of stroke **F.A.S.T.**



### FACE

Ask the person to **smile**. Does one side droop?



### ARMS

Ask the person to **raise both arms**. Does one arm drift downwards?



### SPEECH

Ask the person to **repeat a simple sentence**. Are the words slurred?



### TIME

If the person shows any of these symptoms, call **911** immediately.

Learning the signs of a stroke can **HELP SAVE LIVES**

SOURCE: Adapted from the Cincinnati Pre-hospital Stroke Scale, University of Cincinnati, 1997.

## Stroke Systems of Care

 <b>Community</b>	 <b>Pre-Hospital</b>	 <b>Hospital</b>	 <b>Post-Hospital</b>
<b>Detection</b> Everyone knows the signs of stroke and the need to call <b>911</b> immediately.	<b>Delivery</b> Fast emergency medical services (EMS) transport to the hospital with pre-hospital notification that they are on the way.	<b>Decision</b> Identify stroke, quickly decide on and provide appropriate treatment.	<b>Discharge Coordination</b> Patient rehabilitates, recovers, and returns home.

SOURCES: Paul Coverdell National Acute Stroke Program, CDC; Guidelines for the Early Management of Adults with Ischemic Stroke, Circulation, May 22, 2007.



The **STROKE SYSTEMS OF CARE** depends on coordinated partnerships among health systems and professionals, smooth transitions from one care setting to the next, data-driven quality improvement programs that provide the best care to every patient every time, consistent hospital discharge processes with all of the patient's healthcare professionals, and continued actions that improve patient care and save lives.

## APPENDIX

[Vital Signs: Preventing Stroke Deaths | CDC Archive](#)