





Year Anniversary

60-PLUS YEARS OF FIGHTING STROKE

2018 marks two decades since the **American Stroke Association** was founded as a division of the American Heart Association. But long before we adopted the name, we adopted stroke as a significant part of American Heart Association efforts.

In the early 1950s, the American Heart Association president organized the Princeton Conferences, which served as a catalyst for stroke research. Since then, the American Heart Association has championed the cause, creating its Stroke Council, publishing the Stroke journal, organizing an annual International Stroke Conference, spearheading education programs and formally adding stroke to the American Heart Association mission.

When the American Stroke Association was created in 1998, the first acute treatment for ischemic stroke had only recently been approved by the U.S. Food and Drug Administration and fewer than one percent of patients received it. Over the last 20 years, the American Stroke Association, working with our volunteers, researchers and many other partners, has led significant progress in preventing stroke, improving patient outcomes, and maximizing recovery.

This progress is personalized through the experience of the Summers family.

For 20 plus years, Debbie, a mother, nurse and stroke coordinator at St. Luke's Hospital in Kansas City, and longtime American Stroke Association volunteer, has dedicated her professional life to improving stroke care in her community and across the nation.

While most kids grew up watching cartoons, her son Sean was watching NIH Stroke Scale videos with his mom. What he learned paid off when Sean, now 26, spotted stroke symptoms in his father in August 2017.

Sean's prompt call to 911 triggered a swift response. Paramedics transported Terry to St. Luke's East Hospital, a certified Primary Stroke Center, where the stroke team administered the clot-busting drug in just over 30 minutes, well under the recommended 60-minute goal.

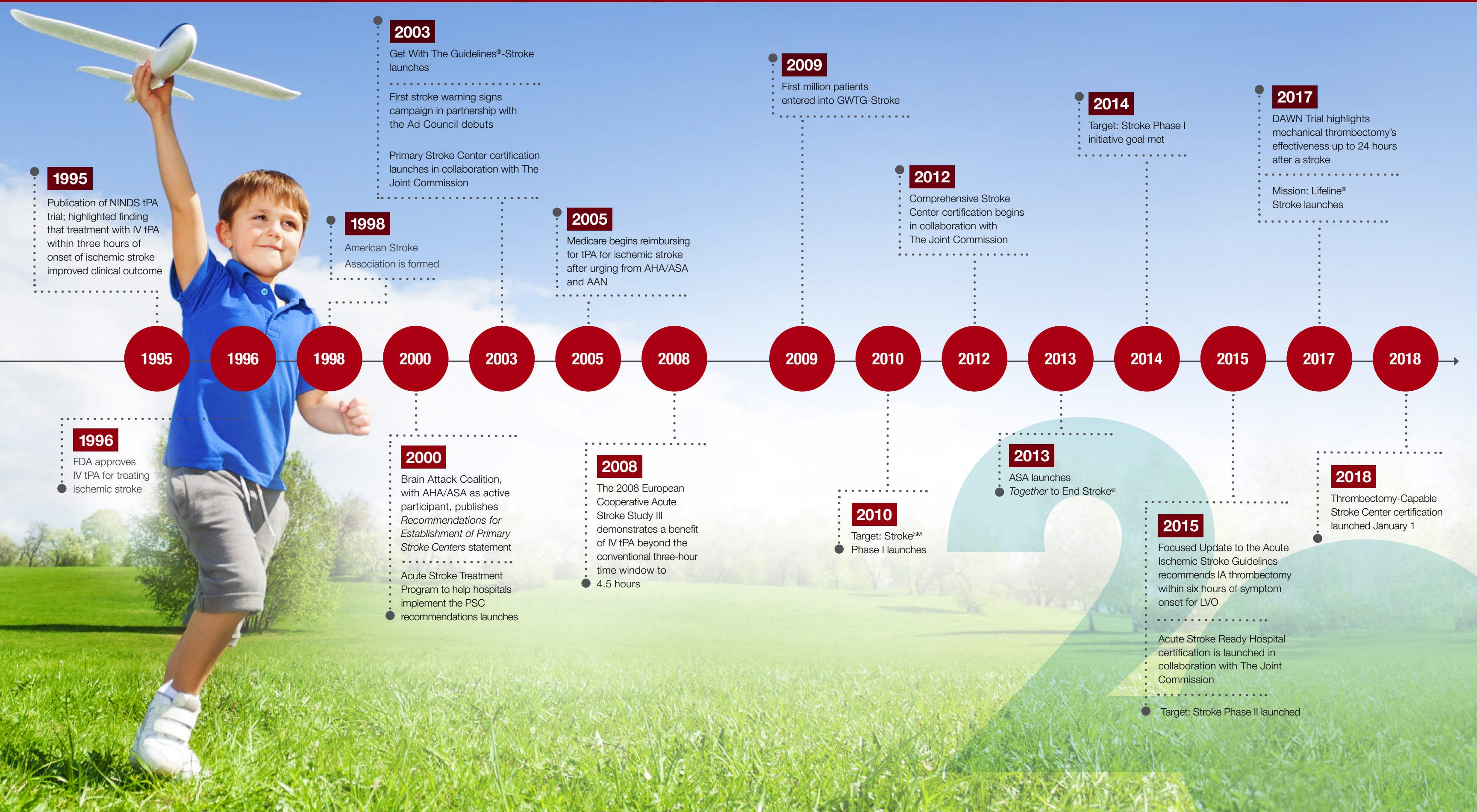
Terry was then transferred to St. Luke's main campus, a certified Comprehensive Stroke Center, for more advanced treatment recommended by AHA/ASA guidelines since 2015 to mechanically grab and pull out the clot. Within three days, Terry was home from the hospital, and 10 days later, he was back to work.

If Terry's stroke had happened 20 years ago, the most likely outcome would have been serious, permanent disability. Instead, Sean's prompt action and the stroke care protocols and best practices that Debbie worked with the ASA to develop over the last two decades resulted in Terry's full recovery.

“The system of care worked just as it should.”

— Debbie Summers

Key Milestones



1995

Publication of NINDS tPA trial; highlighted finding that treatment with IV tPA within three hours of onset of ischemic stroke improved clinical outcome

1996

FDA approves IV tPA for treating ischemic stroke

2003

Get With The Guidelines®-Stroke launches

First stroke warning signs campaign in partnership with the Ad Council debuts

Primary Stroke Center certification launches in collaboration with The Joint Commission

1998

American Stroke Association is formed

2005

Medicare begins reimbursing for tPA for ischemic stroke after urging from AHA/ASA and AAN

2009

First million patients entered into GWTG-Stroke

2012

Comprehensive Stroke Center certification begins in collaboration with The Joint Commission

2014

Target: Stroke Phase I initiative goal met

2017

DAWN Trial highlights mechanical thrombectomy's effectiveness up to 24 hours after a stroke

Mission: Lifeline® Stroke launches

1995

1996

1998

2000

2003

2005

2008

2009

2010

2012

2013

2014

2015

2017

2018

2000

Brain Attack Coalition, with AHA/ASA as active participant, publishes *Recommendations for Establishment of Primary Stroke Centers* statement

Acute Stroke Treatment Program to help hospitals implement the PSC recommendations launches

2008

The 2008 European Cooperative Acute Stroke Study III demonstrates a benefit of IV tPA beyond the conventional three-hour time window to 4.5 hours

2013

ASA launches *Together to End Stroke®*

2010

Target: StrokeSM Phase I launches

2015

Focused Update to the Acute Ischemic Stroke Guidelines recommends IA thrombectomy within six hours of symptom onset for LVO

Acute Stroke Ready Hospital certification is launched in collaboration with The Joint Commission

Target: Stroke Phase II launched

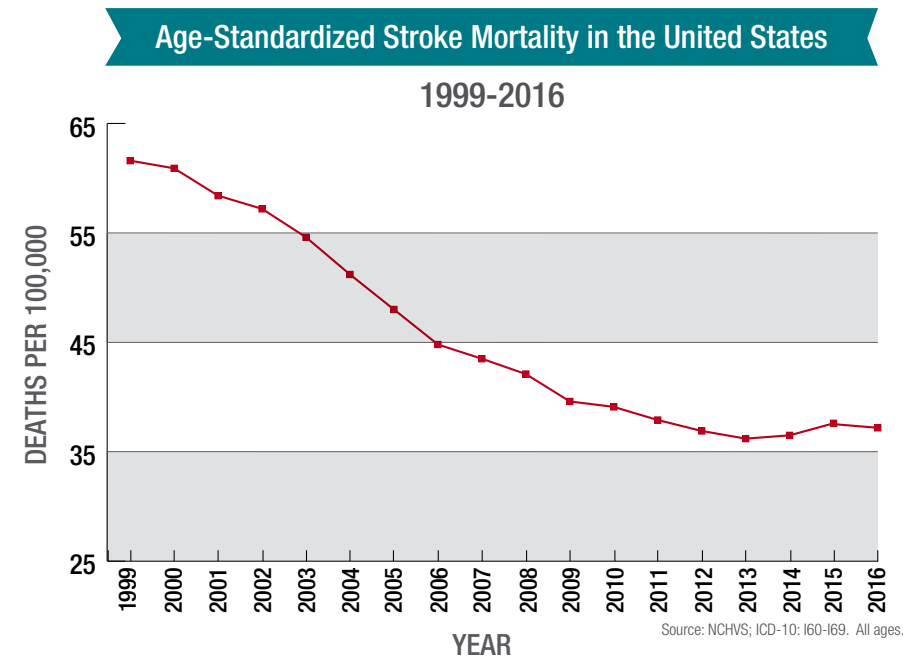
2018

Thrombectomy-Capable Stroke Center certification launched January 1

A story told in numbers—and lives

39.4%

THAT IS HOW MUCH THE U.S. AGE-STANDARDIZED STROKE MORTALITY RATE DECLINED BETWEEN 1999 AND 2016. THIS NUMBER TRANSLATES TO **LIVES SAVED ACROSS THE NATION.**



HIGHLIGHTS OF MORTALITY DECLINE

- Stroke declined from the nation's 3rd to the 4th leading cause of death in 2008 and continued to decline to the 5th leading cause of death in 2013 where it remained in 2016¹.
- American Stroke Association efforts, along with those of other entities, contributed to 68,557 years of potential life gained back from stroke between 1999 and 2015².
- Fewer Americans are dying from stroke, with mortality down from 167,366 deaths in 1999 to 142,142 deaths in 2016¹.

PROGRESS IN TREATMENT

The landscape for stroke care changed dramatically in 1996, when the U.S. Food and Drug Administration approved the first acute treatment for ischemic stroke, the clot-busting drug alteplase (IV tPA). Educating of the public to understand stroke warning signs and healthcare systems' implementation of stroke protocols have been key in the fight against stroke.

- Among hospitals participating in our Get With The Guidelines®-Stroke quality improvement program, alteplase (IV tPA) use among eligible patients arriving within two hours increased from 42.6 in the 2003-2005 period to 77 percent in 2010-2011.³
- Between 2003 and 2012, the number of hospitals providing endovascular therapy more than doubled from 12.9 to 28.9 percent⁴.
- Use of Get With The Guidelines-Stroke has been demonstrated to improve adherence to stroke quality measures. For example, the percentage of ischemic stroke or TIA patients with high LDL cholesterol levels who are discharged on statin therapy has increased from 40.1 percent in 2003-04 to 97.8 percent by 2017.



HIGH BLOOD PRESSURE: CHALLENGES AND MILESTONES

High blood pressure is a major risk factor for stroke and increases the risk of dying from cardiovascular disease. The prevalence of high blood pressure in non-Hispanic black males and females, non-Hispanic white males and females and Mexican American females increased between 1999-2006 and 2007-2014.⁵

But a couple of positive statistics point to important strides:

- More adults with high blood pressure are aware of their condition and are doing something about it, according to data from the National Health and Nutrition Examination Surveys (NHANES).⁵
- Among adults with high blood pressure, awareness improved from 75.2 to 82.1 percent, those receiving treatment increased from 65.0 to 74.5 percent and the control rates improved from 39.4 to 51.8 percent according to NHANES data between 1999-2009 and 2009-2012.⁵

The American Stroke Association is proud of this progress, which wouldn't be possible without the steadfast work of researchers, volunteers, healthcare professionals and many others.

SLOWING PROGRESS ON STROKE MORTALITY

While we've seen great strides, we know that our work must continue:

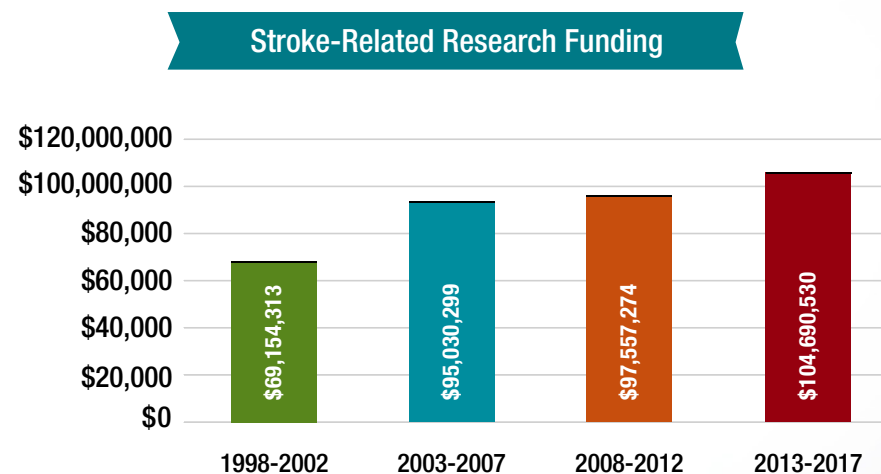
- A 2017 CDC report indicates that the declines in stroke mortality rates observed over the last few decades have slowed in the past few years. Rates have even increased from previous years in 2013, 2014, and 2015.⁶
- The stroke mortality rate trend among Hispanics reversed in 2013, changing from a 3.6-percent annual decline between 2000 and 2013 to a 5.8-percent annual increase between 2013 and 2015.⁶
- The decline in stroke mortality rates slowed in 38 states from 2000 to 2015.⁶

We have a lot of work ahead and a long way to go.

FINDING ANSWERS, FUNDING RESEARCH

Since 1998, the American Stroke Association has funded nearly 2,400 stroke-related research awards, totaling more than \$366.4 million. The single largest source of stroke research funding comes from a partnership with the Henrietta B. and Frederick H. Bugher Foundation, which targets innovative research, funding potentially high-impact novel ideas.

This funding has given life to stroke prevention research centers, emphasizing genetics as well as other factors that influence stroke risk.



Stroke *Journal* — where breakthroughs break

Stroke, an American Heart Association/American Stroke Association scientific journal, began publishing in 1970 with six issues per year. It became a monthly publication in 1988.⁷ In fiscal year 2016-2017, Stroke garnered 3.2 billion media impressions. In calendar year 2016, the journal logged 11.5 million article downloads and 4.6 million online visits. As of November 2017, it has more than 6,800 Twitter followers.⁸

GUIDELINES AND STATEMENTS TURN SCIENCE INTO PRACTICE

Scientific studies must be translated to the point of care to have a real-life impact. That's the purpose of our guidelines and statements, which first appeared in a 1994 AHA special report on managing patients with acute ischemic stroke written by a group of stroke neurologists.

American Stroke Association Major Stroke Guidelines:

- Prevention of Stroke in Patients with Stroke or Transient Ischemic Attack
- Primary Prevention of Stroke
- Management of Aneurysmal Subarachnoid Hemorrhage
- Management of Spontaneous Intracerebral Hemorrhage
- Prevention of Stroke in Women
- Management of Patients with Unruptured Intracranial Aneurysms
- Focused Update of the 2013 Guidelines for Early Management of Patients with Acute Ischemic Stroke Regarding Endovascular Treatment
- Adult Stroke Rehabilitation and Recovery

Coming soon: 2018 Guideline for the Early Management of Patients with Acute Ischemic Stroke

Scientific statements review data on a specific subject, evaluate its relationship to overall stroke science and often provide the AHA/ASA position. Statements are supported by scientific studies published in recognized journals and undergo a rigorous review and approval process.

Notable Scientific Statements from Recent Years:

- Management of Stroke in Infants and Children, 2008
- Vascular Contributions to Cognitive Impairment and Dementia, 2011
- Evidence for Inclusion of Stroke as an Outcome and Risk Equivalent in Vascular Disease Risk Scores, 2012
- Forecasting the Future of Stroke in the U.S.: A Policy Statement from the AHA and ASA, 2013
- Risk Adjustment of Ischemic Stroke Outcomes for Comparing Hospital Performance, 2014
- Factors Influencing the Decline in Stroke Mortality, 2014
- Palliative and End-of-Life Care in Stroke, 2014
- Management of Brain Arteriovenous Malformations, 2016
- Presidential Advisory on Brain Health in Adults, 2017

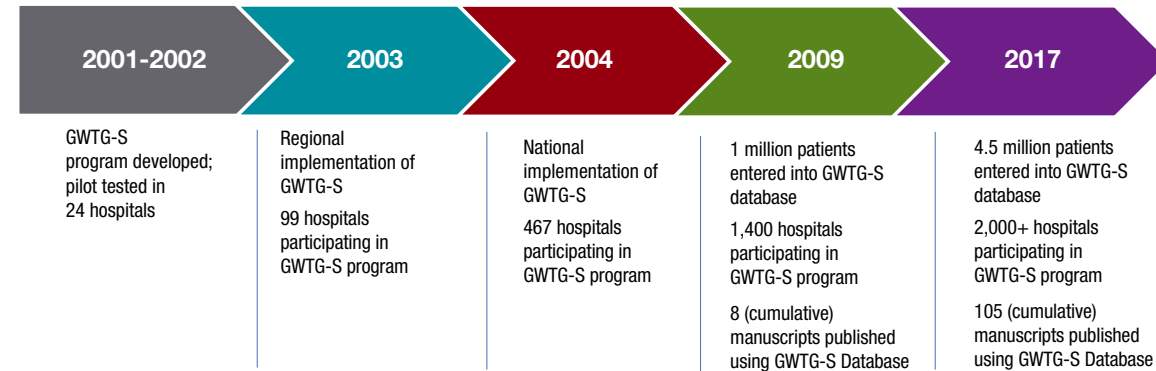


Improving patient care & achieving a better quality of life

GET WITH THE GUIDELINES®-STROKE

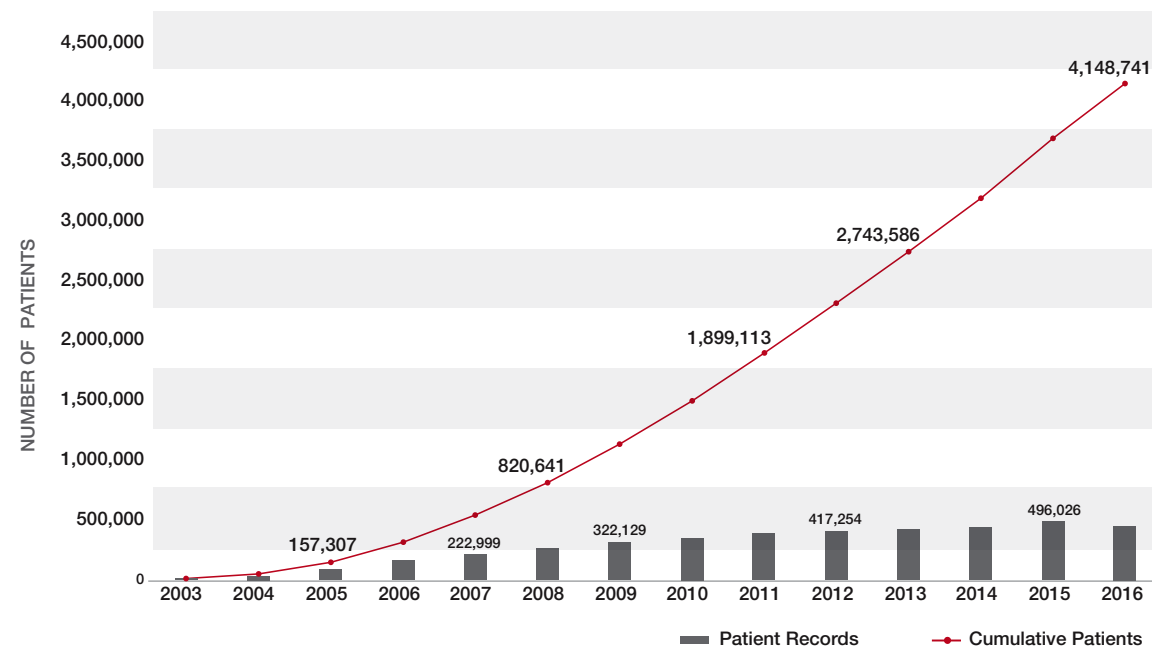
Get With The Guidelines®-Stroke helps hospitals adhere to evidence-based treatment guidelines to help stroke patients achieve a better quality of life and live longer. The program grew from 24 participating hospitals in 2003 to 2,000+ hospitals by the end of 2017.

Get With the Guidelines-Stroke: Key Milestones



Currently, approximately 80% of all ischemic stroke patients are discharged from GWG-S participating hospitals. As participating hospitals increased, patient records did too, propelling the Get With The Guidelines-Stroke database to more than 4.5 million patients across the nation. This vast repository of information has led to new stroke research, yielding new interventions and improved outcomes.

Patient Enrollment in GWG - Stroke from 2003 to 2016



Source: Cora H Ormseth et al. Stroke Vasc Neurol 2017;svn-2017-000092
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 Enrollment in GWG-Stroke from 2003 to 2016. Yearly and cumulative enrollment in GWG-Stroke from 2003 to 2016. Used with permission from the American Heart Association. GWG, Get With the Guidelines.

TARGET: STROKESM

TARGET: STROKE complements Get With The Guidelines-Stroke by helping hospitals reduce the time between patient arrival and use of alteplase (IV tPA), a leading FDA-approved treatment for ischemic stroke.

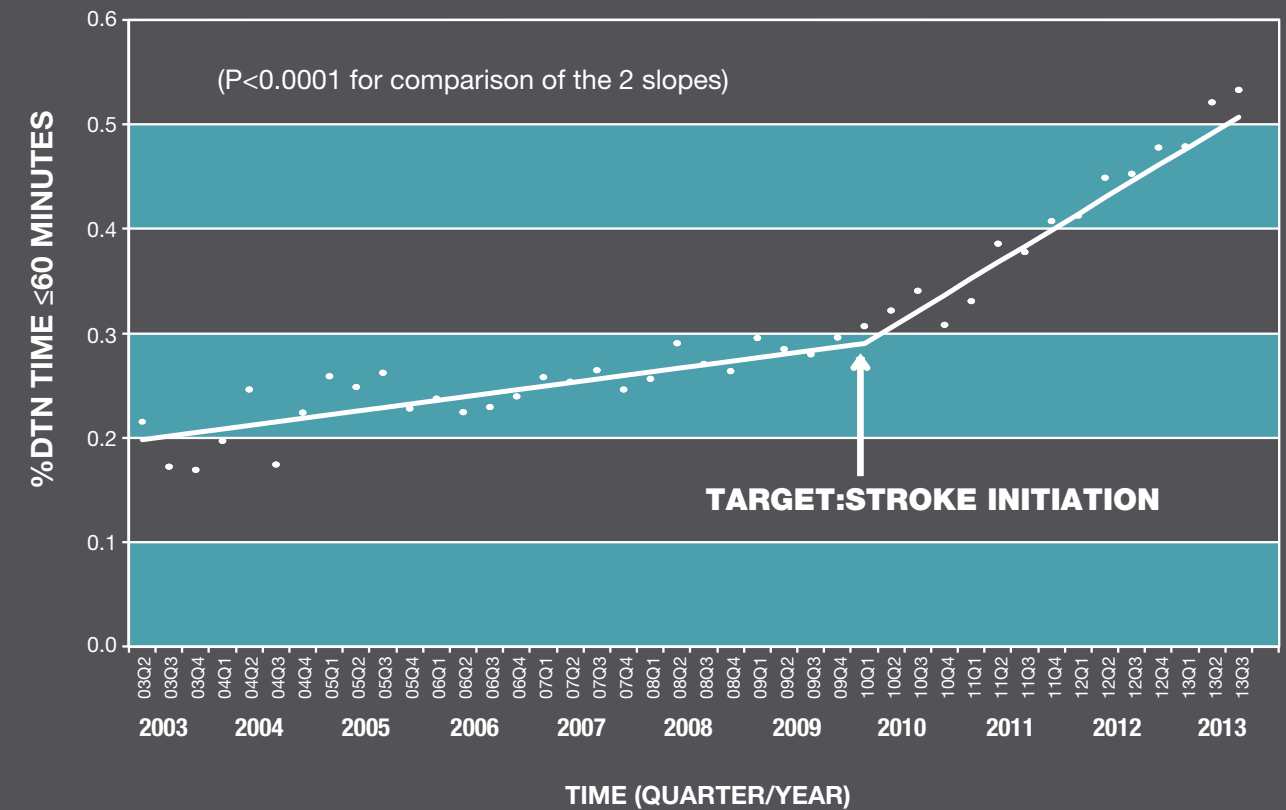
Target: Stroke Phase I established a goal of treating 50 percent or more of eligible patients with tPA within 60 minutes of hospital arrival. By 2014, the Phase I goal was met, meaning:

- An increase in the proportion of patients treated with alteplase within the 60-minute window, from 29.3 to 53.3 percent
- A fourfold increase in the annual rate of improvement in patients treated with tPA alteplase within the 60-minute window
- Fewer hospital deaths, reduced symptomatic intracranial hemorrhage and fewer overall tPA complications with more patients able to be discharged home

Now our aim for Phase II of Target: Stroke is for participating hospitals to achieve door-to-needle times of within 60 minutes in 75 percent or more of acute ischemic stroke patients treated with tPA.

Target: Stroke Phase II is on track to meet this goal in 2018.

Time Trend in the Proportion of Patients with DTN Times within 60 Minutes Pre- and Post-Target Stroke

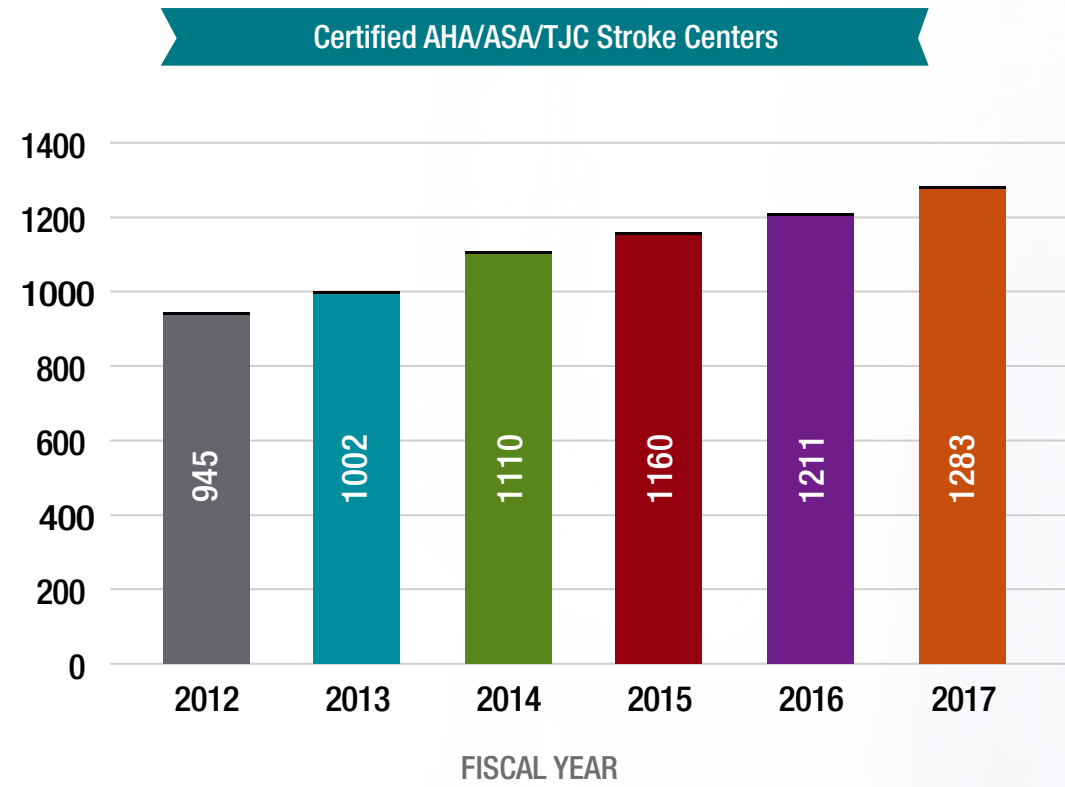


Source: Door-to-Needle Times for Tissue Plasminogen Activator Administration and Clinical Outcomes in Acute Ischemic Stroke Before and After a Quality Improvement Initiative. JAMA. 2014; 311 (16): 1632-1640. doi:10.1001/jama.2014.3203.

STROKE CENTER CERTIFICATION IDENTIFIES HOSPITALS THAT MEET CARE STANDARDS

Since 2003, more than 1,300 hospitals have been certified or accredited by the American Heart Association/American Stroke Association and our collaborators. This includes three co-branded programs with The Joint Commission for Primary Stroke Center, Comprehensive Stroke Center and Acute Stroke Ready Hospital certification.

A fourth co-branded program launched January 1, 2018. Thrombectomy-Capable Stroke Center certification identifies hospitals capable of providing mechanical thrombectomy and post-procedural care to patients with large vessel occlusive ischemic strokes. Studies have shown that treating LVO ischemic strokes with EVT dramatically improves patient outcomes.



Giving stroke survivors a powerful voice

We champion policies and laws that advance stroke prevention, treatment and recovery on the national, state and local levels.

You're the Cure GRASSROOTS ADVOCACY NETWORK

Our grassroots advocacy network harnesses the power of more than 330,000 advocates nationwide, including 33,000 with a specific interest in stroke, to influence policy. Stroke survivors, caregivers, researchers and others engage via www.yourethecure.org, email, text messages and social media, including Facebook (54,000 fans) and Twitter (24,000 followers).

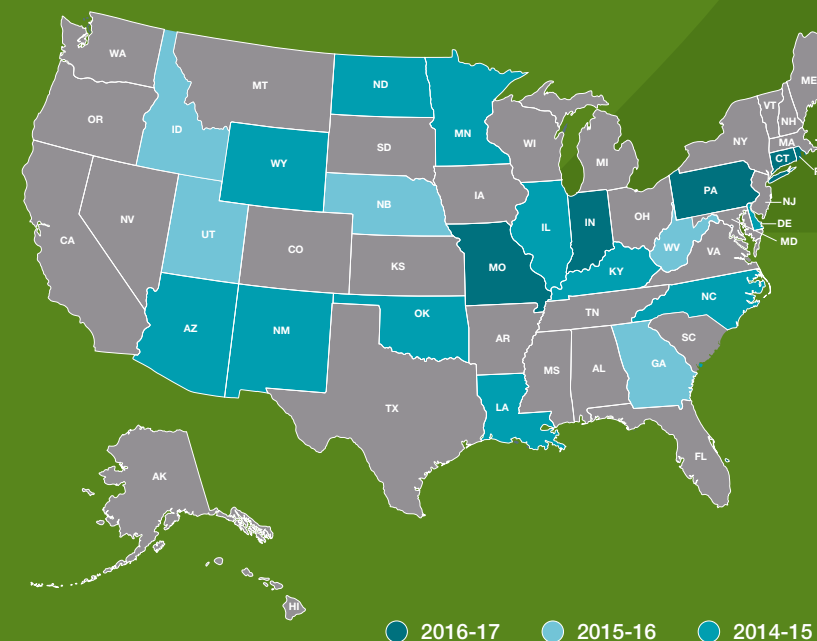
Advocates take their passion and commitment to the halls of power during *You're the Cure* federal and state lobby days, as witnesses at legislative hearings and as speakers at advocacy events. Their presence and personal truths resonate in ways numbers can't. Thanks to the efforts of our *You're the Cure* advocates, we have accomplished many federal, state and local policy wins:

Federal Advocacy accomplishments

- FAST Act:** Since 2009, we've worked with the American Academy of Neurology and other partners to expand Medicare coverage of stroke telemedicine by lifting geographic restrictions. In September 2017, the Furthering Access to Stroke Telemedicine Act (FAST Act) was passed by the Senate. If enacted, FAST will provide wider access to telestroke evaluations for patients across the nation.
 - NIH Funding:** In 1998, we partnered with other groups to convince Congress to double National Institutes of Health funding over a five-year period. The NIH is the nation's largest funder of medical research. Continued advocacy efforts have led to significantly more funding, with an overall increase from \$13.67 billion in 1998 to \$34.08 billion in 2017.
 - Stroke Progress Review Group:** At our urging, Congress encouraged the National Institute of Neurological Disorders and Stroke to convene stroke experts to outline goals and priorities for stroke research funding.
 - Affordable Care Act:** Uninsured Americans who experience a stroke face up to a 56 percent higher risk of death compared to those with insurance. The AHA/ASA advocated for the Affordable Care Act, which protects people with pre-existing conditions from being denied insurance or from losing their coverage.
- A 2016 study released by the AHA/ASA found that more than 6 million adults at risk for cardiovascular disease and stroke and more than 100,000 stroke survivors gained health insurance between 2013 and 2014, the first-year coverage was available under the ACA.
- Medicare Reimbursement for tPA:** Until 2005, Medicare reimbursement for stroke care did not include the cost of treating patients with alteplase, the clot-busting drug. Thanks to AHA/ASA advocacy in partnership with the American Academy of Neurology, reimbursement was amended to reflect alteplase treatment costs for ischemic stroke patients.
 - Extending Medicare Therapy Caps:** The Balanced Budget Act of 1997 imposed arbitrary limits on Medicare outpatient therapy services. The AHA/ASA has advocated successfully for temporary exceptions to the caps, and our efforts may result in a permanent solution if Congress passes legislation under consideration.
 - CDC Division for Heart Disease and Stroke Prevention:** Our advocacy efforts in 2005 resulted in the Centers for Disease Control and Prevention elevating its Cardiovascular Branch to a Division for Heart Disease and Stroke Prevention.

Stroke Facility Designation

21 states and Washington, D.C. have enacted statewide standards for the formal recognition of stroke facility designations and the development of transport protocols, covering about one-third of the U.S. population.



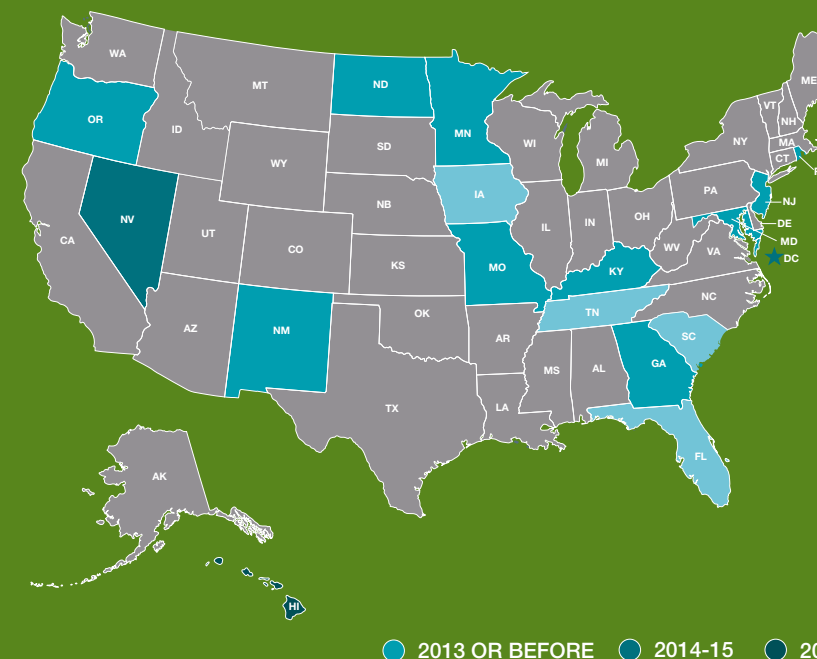
Number of people by state who suffer a stroke each year benefiting from improved stroke systems of care**

AZ	18,328
CT	8,628
DC	2,821
DE	3,018
ID	3,111
IN	18,686
IL	39,918
GA	22,135
KY	12,064
LA	15,761
MN	5,242
MO	19,983
NE	4,041
NM	4,880
NC	32,397
ND	2,283
OK	10,632
PA	50,333
RI	3,321
UT	4,690
WV	6,709
WY	785
Total	289,766

** Combined 2015 Truven Stroke Discharge Data and CDC Stroke Mortality Data 2013

Stroke Registries

16 states and Washington, D.C. have enacted statewide standards for the development and utilization of stroke registries, covering 28 percent of the U.S. population in those areas.



Number of people by state who suffer a stroke each year benefiting from improved stroke systems of care**

DC	2,821
FL	74,710
GA	22,135
HI	2,622
IA	7,799
KY	12,064
MD	19,104
MN	5,242
MO	19,983
NV	6,898
NJ	28,586
NM	4,880
ND	2,283
OR	10,136
RI	3,321
SC	12,899
TN	20,214
Total	227,684

** Combined 2015 Truven Discharge Data and 2013 CDC Stroke Mortality Data

AD COUNCIL

Campaigns deliver lifesaving information

Since 2003, the American Stroke Association has partnered with the nonprofit Ad Council to create public service announcements that increase stroke awareness and response time. Findings from a national survey* of adults 25 and older tell the story:

- Familiarity with the F.A.S.T. acronym for spotting stroke and calling 911 has almost doubled from 24 to 47 percent since our first FAST Ad Council campaign launch in 2012.
- Ability to recall all four letters of F.A.S.T. has doubled from six to 12 percent since the 2012 F.A.S.T. campaign launch.
- Ad Council stroke campaigns have generated more than \$460 million in estimated ad value since the first "I am a stroke" campaign launched in 2003.
- Six distinct campaigns have run since the launch in 2003, including public service announcements targeting high-risk diverse audiences.
- Celebrities participating in the campaigns include Oscar-winner Michael Clarke Duncan, Oscar nominees James Woods and Sharon Stone, NBA All-Star Paul George, actors Don Rickles and Penny Marshall, and many other high-profile personalities.

* The study, commissioned by the Ad Council and conducted by Ipsos, Public Affairs, surveyed approximately 22,155 respondents between October 27, 2014 and September 30, 2017.

F.A.S.T.	October 2012 (before F.A.S.T. launch, Point in Time) GM 25+	November 2013 (1 yr in market) Point in Time Study GM 25+	2014 Median (2 yrs in market) Continuous Tracking GM 25+	2015 Median (3 yrs in market) Continuous Tracking GM 25+	2016 (4 yrs in market) Continuous Tracking GM 25+	2017 (only data from Jan-Sep) Continuous Tracking GM 25+
Familiarity with F.A.S.T.	24%	24%	33%	39%	43%	47%
Ability to recall all four letters of F.A.S.T.	6%	6%	8%	9%	11%	12%
Can name at least one sign, unaided	63%	59%	69%	66%	67%	67%
Can name at least two signs, unaided	45%	28%	53%	49%	50%	49%



Body language can tell you all sorts of things. Like someone is having a **stroke**.

FACE DROOPING

ARM WEAKNESS

SPEECH DIFFICULTY

TIME TO CALL 911

Power To End Stroke launched

POWER TO END STROKE

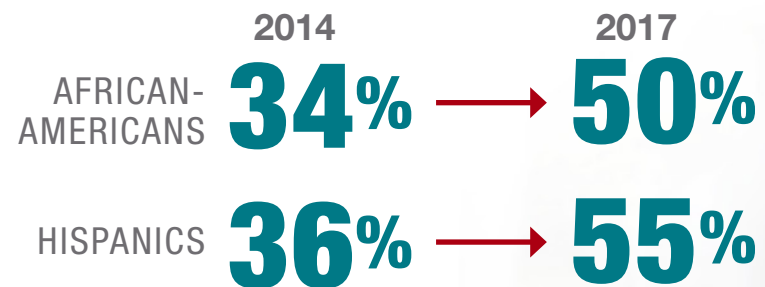
Power To End Stroke launched in 2006 with spokesperson Yolanda King, Dr. Martin Luther King Jr.'s daughter, to reach African-Americans with stroke messages.

More than 75,000 ambassadors helped us increase stroke awareness among African-Americans. Through Power To End Stroke, including the Power Awards weekend, we engaged many celebrities, including Anthony Anderson, Chrisette Michelle, Michelle Williams, BeBe Winans, Sissy Houston and more. Combining this with our Ad Council campaigns, over 750,000 engaged in our programs.

{ OVER **750,000** ENGAGED }

Through our Strokes Target By Color Ad Council campaign, and other campaigns dedicated to the highest-risk African-American communities, including our current EmPOWERED To Serve efforts, we've made significant impact over the years. Most notably, we've seen improvements in recognition of the stroke warning signs.

FAMILIARITY WITH **F.A.S.T.**



Additionally, more African-Americans and Southerners could name the signs of a stroke in 2016 than they could in 2014. This is critical because strokes are more common in southeastern states.



Together to End Stroke begins

UNITING AROUND TOGETHER TO END STROKE.

In 2013, we announced our *Together to End Stroke*® initiative to increase stroke education and awareness and reduce death and disability from stroke.

Together to End Stroke became our rallying cry and a catalyst for uniting people and communities around a shared purpose — coming together to end stroke.

Together, we can:

- **Prevent stroke**, empowering Americans to live healthier lives and keep minds mentally sharp
- **Treat stroke** through faster, better stroke response and effective treatments
- **Beat stroke** by supporting survivors, their loved ones and caregivers throughout the recovery journey

We're reaching as many people as possible with American Stroke Month, National Rehabilitation Awareness Week, World Stroke Day, National Family Caregiver's Month and year-round initiatives to continue building stroke awareness. Our goal is to educate and engage the public, especially multicultural audiences, about stroke.

We do that by leveraging the AHA/ASA brand, increasing social media and local engagement, and encouraging stroke volunteerism and expanding funding opportunities.

Since 2013, the initiative has garnered more than 10 billion impressions from public service announcements and media placements. Individual campaigns continually surpass 100 million impressions and more than 50,000 social media engagements. Media outlets such as the TODAY show, CBS News, WebMD, Doctor Radio, Healthline, Huffington Post, Telemundo, Ebony and others have featured our campaign messaging.

Additionally, StrokeAssociation.org serves more than seven million healthcare professionals, stroke survivors, families and at-risk Americans each year. Our Facebook page has 110,000 fans, and our Twitter feed has 13,000 followers.

Stroke Connection Magazine



Stroke Connection, our award-winning quarterly online magazine, brings stroke survivors and their families together to share their stories and insights. It's a source of in-depth information about stroke conditions and the practical issues of living with stroke day-to-day.

Since 1998, the number of readers has increased more than fourfold, to 216,434, and has evolved from a print magazine to a digital platform.



20



Mitchell S. V. Elkind, MD,
MS, FAAN, FAHA Chair,
ASA Advisory Committee

“Looking to the future”

The future of stroke clinical care, science and advocacy appears brighter than at any time in the 20 years since the American Stroke Association was founded, in 1998. Among stroke researchers and clinicians, the enthusiasm is palpable.

The evolution of stroke systems of care has been thrilling to watch. Stroke care, once seemingly futile next to the robust advances available for cardiac patients, now features amazing stories about lives saved and neurological disasters averted. The short time window for effective stroke treatment has led to developments such as the Mobile Stroke Unit. This “strokemobile” is essentially an emergency room on wheels. This ambulance equipped with advanced imaging capabilities can bring stroke treatment to the patient, resulting in faster treatment with the clot-busting drug alteplase – which is proven to save brain tissue.

“*As in clinical care, we are poised for dramatic advances in acute care, stroke mechanisms, prevention and rehabilitation.*”

For example, over the past three years alone, acute stroke care has exploded through the rapid clinical uptake of stent retrievers for mechanical thrombectomy. In the past year, research has been published suggesting that the time window for acute stroke care may be extended up to 24 hours. Next-generation devices will likely lead to more large vessel occlusion patients who can be successfully treated. In addition, the combination of new anti-thrombotic agents with thrombectomy may enhance the success of mechanical clot disruption and extraction.

The combination of neuroprotective agents with thrombectomy may also lead to an expansion of the therapeutic window beyond 24 hours. Although the failure of many neuroprotective agents in past decades diminished enthusiasm among industry partners and others for their development, the evidence of benefit from extended time windows for acute stroke treatment suggest that the future appears ripe for a new effort to identify neuroprotectants. Advanced and innovative imaging techniques also will be used to identify patients most likely to benefit from thrombectomy and other interventions.

Thanks to the development and refinement of biomarkers for determining the causes of stroke, our understanding of stroke mechanisms will likely also expand considerably. Precision medicine markers, for instance, whether based on imaging, cardiac monitors, blood samples or something else, will provide opportunities to better classify strokes due to heart disease, vascular disease, blood disorders, infections and other causes. Precision markers may also be used to offer targeted preventive therapies. In addition to identifying biomarkers of known diseases, biomarkers may help drive the identification of novel stroke risk factors, such as obstructive sleep apnea and viral infection.

One of the most exciting developments in coming decades will likely be the opening of the “black box” of brain function. The focus of stroke rehabilitation may also shift, from techniques used to help patients compensate for the stroke-induced deficits to treatments that enhance brain recovery or regeneration. Developments in this arena will include efforts in the brain-machine interface, artificial intelligence and robotics. Importantly, these activities will dovetail with new AHA efforts to improve brain health.

Scientists are even now beginning to “crack the code” of how brain, heart, mind and body interact. This connection probably will be bidirectional. Heart disease and atherosclerosis will continue to be studied as major causes of stroke but — just as important — cognitive dysfunction and depression will increasingly be recognized as causes of heart disease and vascular dysfunction. Increased knowledge about the mysteries of the brain and the mind may usher in a new era of improved treatments, including behavioral changes and implementation science. These changes in approach should lead the ASA to grow its leadership in research related to the function of nerve cells and their supporting structures.

A focus on brain health will also lead the ASA into new areas entirely, like neurodegeneration. Traditionally, scientists have separated the gradual decline and decay of brain tissue that leads to diseases such as Alzheimer’s and dementia from stroke, which represents a sudden injury to brain structures caused by vascular occlusion or rupture. Recent years, however, have seen a new awareness of how vascular risk factors and cerebrovascular disease lead to dementia, and even Alzheimer’s disease. The presumption that vascular dementia and Alzheimer’s disease occupy distinct spheres of pathophysiology, with sharp borders, is now recognized as suspect. The future of research in cognitive decline and dementia will therefore increasingly require interdisciplinary efforts among researchers with diverse backgrounds, interests and skills. The ASA can and should play a major role in this evolving collaborative research area.

Research on behavioral, clinical and population aspects of stroke will also evolve rapidly in the coming years. Now that the treatments for acute stroke and stroke prevention have reached a point of undeniable value, we must ask ourselves how we can best get these treatments to those who need them. Essential research questions in the future will be: How can we teach people the symptoms of acute stroke? How can we get people to exercise and eat well to prevent stroke? How can we reach the most vulnerable and remote populations? Answering these questions will require technological solutions, new ways of conducting research, and new approaches to the collection, management, and analysis of data.

Realizing the full potential of these scientific and clinical advances will be possible only with a continued concerted effort on the part of physicians, allied health professionals, patients and caregivers. Essential to this effort, of course, will be the support of local, regional and national decision makers. Thus, advocacy will be an even more important aspect of the ASA’s work. The benefits of discovery will be lost if not implemented. Outreach and education, improved registries, robust systems of care, resources devoted to research — all will be needed at ever-increasing levels if the full scope of the stroke scientific and clinical revolution is to be realized. Finally, because of the burden of cerebrovascular disease internationally, these efforts will only fully be considered successful if their reach extends globally.

“*With these many advances, the outlook for stroke patients — and people at risk — should improve markedly.*”

In the decades to come we should see a decrease in stroke mortality and disability. To achieve full victory, however, these gains still must be translated and applied for the most vulnerable populations. Meeting our goals, therefore, will require redoubling efforts to bring stroke under control in these traditionally disadvantaged populations. If the past 20 years of the ASA are an indication, however, I have no doubt these challenges will be met with success.

ASA Advisory Committee Chairs

- 1997-1998: William Feinburg, M.D.
1998-2000: Harold P. Adams, Jr., M.D.
2000-2002: Edgar Kenton, M.D.
2002-2004: Larry Goldstein, M.D.
2004-2005: Robert Adams, M.D.
2005-2008: Ralph Sacco, M.D.
2008-2010: Pierre Fayad, M.D.
2010-2014: Hank Wasiak
2014-2016: Mary Ann Bauman, M.D.
2016-2018: Mitchell Elkind, M.D.

References:

1. Centers for Disease Control and Prevention, National Center for Health Statistics. Underlying Cause of Death 1999-2016 on CDC WONDER Online Database, released December, 2017. Data are from the Multiple Cause of Death Files, 1999-2016, as compiled from data provided by the 57 vital statistics jurisdictions through the Vital Statistics Cooperative Program. Accessed at <http://wonder.cdc.gov/ucd-icd10.html> on Jan 2, 2018 10:31:09 AM
2. Unpublished tabulations, American Heart Association.
3. Schwamm, L. H., Ali, S. F., Reeves, M. J., Smith, E. E., Saver, J. L., Messe, S. et al. (2013). Temporal trends in patient characteristics and treatment with intravenous thrombolysis among acute ischemic stroke patients at Get With The Guidelines-Stroke hospitals. *Circ Cardiovasc Qual Outcomes*, 6(5),543-549.
4. Menon, B. K., Saver, J. L., Goyal, M., Nogueira, R., Prabhakaran, S., Liang, L. et al. (2015). Trends in endovascular therapy and clinical outcomes within the nationwide Get With The Guidelines-Stroke registry. *Stroke*, 46(4), 989-995.
5. Benjamin, E. J., Blaha, M. J., Chiuve, S. E., Cushman, M., Das, S. R., Deo, R. et al. (2017). Heart Disease and Stroke Statistics-2017 Update: A Report From the American Heart Association. *Circulation*, 135(10), e146-e603.
6. Yang, Q., Tong, X., Schieb, L., Vaughan, A., Gillespie, C., Wiltz, J. L., et al. G. (2017). Vital Signs: Recent Trends in Stroke Death Rates-United States, 2000-2015. *MMWR Morb Mortal Wkly Rep*, 66(35), 933-939.
7. McDowell, F.H. Stroke: 30 years of progress: 1977- 1981. *Stroke*, 32(3):595-6.
8. Retrieved from: <http://stroke.ahajournals.org/content/stats> and <http://www.ahajournals.org/content/metrics>

