

Improving the care of stroke patients

Using an evidence-based quality improvement initiative enhances outcomes for stroke patients.

By Kathy Morrison, MSN, RN, CNRN

EACH YEAR, about 780,000 new or recurrent strokes occur in the United States, killing about 150,000 people. This averages out to one stroke every 40 seconds and one stroke death every 3 to 4 minutes.

Perhaps even more alarming, the incidence of transient ischemic attack (TIA)—a warning sign of impending stroke—exceeds that of stroke. About 15% of strokes occur within 90 days of a TIA. (See *Stroke: A crisis for the brain and body*.)

Improving treatment and outcomes for stroke patients is imperative. Fortunately, evidence-based guidelines are available to help healthcare providers do just that. Our facility has enhanced stroke care by taking part in Get With The Guidelines—Stroke (GWTG—Stroke). Launched in 2004 to improve acute stroke treatment and prevent ischemic strokes, this initiative is part of the American Stroke Treatment Program, created by the American Stroke Association (ASA) and the multidisciplinary Brain Attack Coalition (BAC).

Understanding GWTG

GWTG—Stroke helps healthcare facilities ensure continuous quality improvement of stroke treatment by aligning clinical care with evidence-based practice guidelines. It focuses on quick diagnosis and treatment using protocols to ensure appropriate care and discharge of stroke patients. GWTG is available for implementation at acute-care hospitals, and thousands of healthcare fa-

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LEARNING OBJECTIVES

1. Describe the types of stroke and risk factors for stroke.
2. Discuss how to use evidence-based practices to improve the quality of care for stroke patients.
3. Explain appropriate management of patients with stroke.

Stroke: A crisis for the brain and body

Although a stroke occurs in the brain, it can affect the entire body. Disabilities caused by stroke range from mild to severe and may include paralysis, cognitive and speech problems, and difficulty performing activities of daily living.

When considered separately from other cardiovascular diseases, stroke ranks as the third leading cause of death. Among neurologic conditions, it's the leading cause of long-term disability. Only 50% to 75% of stroke survivors regain functional independence.

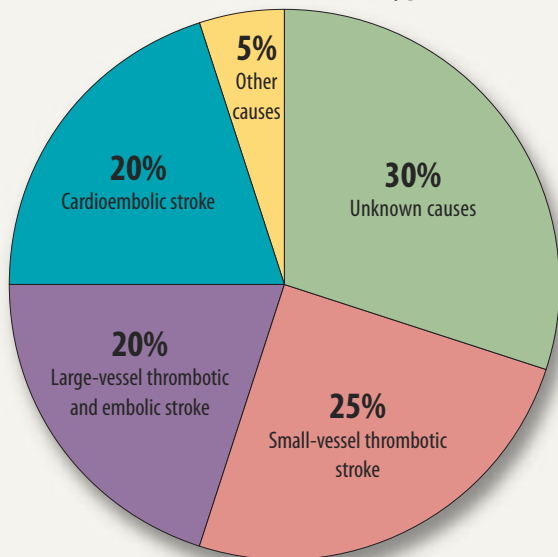
Categorizing stroke

Strokes occur in two basic types—*ischemic* and *hemorrhagic*. *Ischemic* stroke, accounting for 80% to 85% of strokes, results from reduced or interrupted blood supply to the brain. Without adequate blood flow, tissue death occurs in the region served by the blocked vessel.

Ischemic stroke is subdivided into several types based on the underlying cause (as shown in the pie chart below).

- Large-vessel thrombotic and embolic strokes result from hypoperfusion, hypertension, and arteriogenic emboli from large arteries to distal branches.
- Small-vessel thrombotic stroke (lacunar stroke) typically stems from plaque, diabetes mellitus, or hypertension.
- Cardioembolic stroke results from atrial fibrillation, valve disease, or ventricular thrombi.
- Other types of ischemic stroke are caused by prothrombic states, arterial dissection, arteritis, and drug abuse.
- For the remaining 30% of ischemic strokes, the cause isn't known. These strokes are termed *cryptogenic*.

Ischemic stroke subtypes



Hemorrhagic stroke occurs when a blood vessel ruptures and blood leaks into brain structures. Its most common underlying cause is hypertension. Less often, it results from rupture of an aneurysm or arteriovenous malformation.

Risk factors for stroke

Some risk factors, such as lifestyle habits, can be controlled, modified, or prevented. Others, such as heredity or natural processes, can't be changed.

Modifiable risk factors include the following:

- *Hypertension*, the most important modifiable risk factor. The higher the blood pressure, the higher the risk of stroke. Controlling hypertension reduces the stroke risk.
- *High cholesterol*. While high blood cholesterol raises the risk of stroke, treatment with statin drugs may reduce risk by about 30%.
- *Diabetes mellitus*. Diabetes is an independent risk factor for stroke. Controlling diabetes significantly reduces risk.
- *Smoking*. Smokers have twice the risk of ischemic stroke and two to four times the risk of hemorrhagic stroke. Smoking cessation reduces risk.
- *Alcohol intake*. Heavy intake (five or more drinks per day) increases the risk of stroke. Light to moderate intake (two drinks per day for men and one drink per day for women) decreases the risk—although experts don't recommend anyone take up drinking to prevent stroke.
- *Sedentary lifestyle*. A low activity level increases the risk of stroke. An active lifestyle lowers risk, with intensive activity providing more benefits than light to moderate activity.
- *Obesity and increased abdominal fat*. Abdominal obesity, as indicated by increased waist circumference (greater than 40" [102 cm] in men and 35" [88 cm] in women) increases risk of stroke.
- *Atrial fibrillation*. This arrhythmia is associated with a three- to fourfold increase in stroke risk. Antithrombotic therapy reduces the risk.

Nonmodifiable risk factors include the following:

- *Age*. Stroke incidence rises dramatically with age, doubling for each decade after 55 years.
- *Gender*. Men have a higher stroke incidence until age 85, when women may have a slightly higher incidence. At all ages, strokes kill more women than men.
- *Race and ethnicity*. African Americans have a 38% or higher stroke incidence than European Americans, possibly from a higher prevalence of other risk factors (such as hypertension). Hispanic Americans have a higher risk than European Americans but a lower risk than African Americans.
- *Family history of cerebrovascular or cardiovascular disease*. Having parents, grandparents, or siblings who've had a stroke increases a person's risk. Also, some rare genetic disorders are associated with stroke.

cilities now participate.

Many facilities become familiar with GWTG when pursuing Joint Commission certification as a primary stroke center—a hospital-based cen-

ter that stabilizes and provides emergent care to acute stroke patients, transfers patients to a comprehensive stroke center, or admits them and provides further care as appropriate.

However, a facility doesn't have to be a primary stroke center to use GWTG. Even if your facility doesn't plan to become a primary stroke center or implement GWTG, our



Resources for improving stroke care

Healthcare facilities and professionals interested in improving the care of stroke patients can get valuable information from the websites of the American Stroke Treatment Program (ASTP) and the American Stroke Association (ASA). Resources available on these websites include:

- primary and secondary stroke prevention guidelines
- program capacity assessment criteria tool to analyze current programs and track follow-up
- prehospital checklist
- stroke scales for patient assessment
- samples of hospital process documentation
- implementation tips, including how to overcome common barriers
- patient education materials
- professional educational resources.

The ASTP website is www.strokeassociation.org/presenter.jhtml?identifier=3039761. The ASA website is www.strokeassociation.org/presenter.jhtml?identifier=3002728.

Also, ASA's field staff can offer suggestions and insights about successful initiatives at other healthcare facilities. (Consulting with ASA's physician expert helped our facility reach 85% compliance with the Joint Commission's lipid evaluation performance measure for stroke patients.) Another excellent resource is the Joint Commission's publication *Disease-Specific Care Certification Manual* (second edition).

hospital's experience with the program can help you and your colleagues learn how to use evidence-based practice guidelines to improve the quality of stroke care.

Recommendations for primary stroke centers

BAC recommendations for facilities pursuing designation as a primary stroke center include:

- establishing criteria for emergency response
- availability of neuroimaging 24 hours a day, 7 days a week
- laboratory, neurology, and neurosurgery support
- administrative support
- appropriate staff education
- outcomes tracking.

Improving the infrastructure, evaluating treatment

Having a primary stroke center improves the infrastructure through which a facility delivers care, promotes quick diagnosis and treatment, and emphasizes proven treatments. At many primary stroke centers, treatment is measured and evaluated using GWTG electronic tools that offer patient-specific guideline information. These interactive tools allow each facility to track its adherence to the guidelines—both individually and against national benchmarks over time. They also generate automated patient education materials and, with permission, send data to the Joint Commission or other third parties.

Certification criteria

In 2003, ASA and the Joint Commission collaborated to develop the voluntary primary stroke center certification program, which allows consumers and emergency medical service professionals to identify healthcare facilities equipped to treat acute stroke according to nationally recognized standards. Certification criteria were developed by ASA, BAC, and the Joint Commission. (See *Resources for improving stroke care*.)

To become certified as a primary stroke center, a facility takes these steps:

- identifies internal program champions to develop, lead, and mobilize teams
- builds a team to implement treatment
- assesses current treatment and identifies areas for improvement
- refines processes
- implements needed changes
- continues to pursue excellence.

Our journey to certification

In March 2004, the Neuroscience Service Line at our 590-bed facility decided we were ready to pursue certification as a primary stroke center. A program coordinator was designated, and a stroke subcommittee was formed from our multidisciplinary Neuroscience Care Management Team to prepare the application for certification.

To gain an overview of the certification process, stroke subcommittee members attended an ASA-sponsored conference, "Improving Stroke Care at Your Hospital,"

which featured a workshop on GWTG. Also, GWTG staff came to our hospital and presented the program to our nursing and clinical systems administrators.

Performance measure review

The stroke subcommittee conducted a review of the performance measures affecting outcomes in stroke patients, listed in the Joint Commission's *Disease-Specific Care Certification Manual* (second edition). These measures include:

- initiating deep-vein thrombosis prophylaxis
- giving antithrombotics within 48 hours of hospitalization
- prescribing antithrombotics at discharge
- providing anticoagulant therapy to patients with atrial fibrillation
- considering tissue plasminogen activator (tPA) therapy (see *Determining eligibility for tPA therapy*)
- treating low-density lipoproteins greater than 100 mg/dL
- screening the patient for dysphagia
- providing stroke education to the patient and family

- providing smoking cessation materials to the patient and family
- considering a rehabilitation plan.

For this review, a spreadsheet was created that covered all 450 stroke patients treated from July 2003 through June 2004; it was organized according to each performance measure. Although the initial database was time-consuming to develop, the effort paid off by providing a crucial overall picture of the stroke patient population.

Before the database was created, our facility could track stroke patients only through an annual retrospective chart review of a representative sampling of stroke cases. Now that we're using GWTG, we have concurrent data on each stroke and TIA patient as he or she is admitted, which allows more timely documentation of areas that need improvement. Largely because of this performance measure reporting, our 2-year recertification visit by the Joint Commission was a breeze.

Our primary stroke center coordinator saw every patient with suspected stroke or TIA who was admitted to the hospital, gathering data for the new database and mentoring the nursing staff in performance measures and standards.

Implementation and site visits

Our target date for implementing GWTG was July 2004. In November 2004, the Joint Commission conducted its site visit of our primary stroke center—and we were awarded certification. In October 2006, the Commission made its unannounced 2-year site visit. During both visits, surveyors created a collaborative rather than investigative atmosphere, and supported our efforts by making suggestions and sharing ideas gained from other successful primary stroke centers.

Pinpointing areas for improvement

Before we implemented GWTG, our facility complied with only six



Determining eligibility for tPA therapy

Patients with apparent ischemic stroke confirmed by absence of hemorrhage on computed tomography (CT) scan should be evaluated immediately to determine eligibility for tissue plasminogen activator (tPA) therapy. The American Heart Association and American Stroke Association recommend I.V. tPA therapy within 3 hours of stroke onset in eligible patients. (Because of the bleeding risk, patients with hemorrhagic stroke aren't eligible.)

According to guidelines from the Brain Attack Coalition's tPA Stroke Study Group, patients can receive tPA only if they:

- are age 18 or older
- have been diagnosed with ischemic stroke causing a measurable neurologic deficit
- experienced symptom onset less than 180 minutes before tPA therapy would start.

Contraindications for tPA therapy include:

- evidence of intracranial hemorrhage on pretreatment CT scan
- clinical presentation that suggests subarachnoid hemorrhage, even with a normal CT scan
- active internal bleeding
- known bleeding disorder (for instance, platelet count below 100,000/mm³)
- heparin administration within 48 hours and activated partial thromboplastin time greater than the upper limit of normal
- current oral anticoagulant use, or recent use with a prothrombin time longer than 15 seconds
- within 3 months of intracranial surgery, serious head trauma, or previous stroke
- on repeated measurements, systolic pressure above 185 mm Hg or diastolic pressure above 110 mm Hg at the time therapy is to begin and the patient needs aggressive treatment to reduce blood pressure to within these limits
- history of intracranial hemorrhage
- known arteriovenous malformation or aneurysm.
- stroke symptoms that are minor or improving rapidly
- major surgery or serious trauma excluding head trauma in the past 14 days
- history of GI or urinary tract hemorrhage in the past 21 days
- recent arterial puncture at a noncompressible site
- recent lumbar puncture
- abnormal blood glucose level (below 50 or above 400 mg/dl)
- post-myocardial infarction pericarditis
- seizure occurring at the time of stroke symptom onset.

Source: www.stroke-site.org/guidelines/tpa_guidelines.html

of the 10 performance measures for stroke patients; now it complies with nine. (We continue to be challenged in documenting that patient and family education has been completed.) Using the GWTG database, we can produce reports that compare our performance against that of other facilities. We've found this is a powerful way to pinpoint areas that need improvement and motivate staff to implement required changes.

We're also using the database to

track door-to-computed tomography (CT) time—the interval from the patient's arrival in the emergency department (ED) to completion of the CT scan. (Previously, we'd used a smaller database that lacked benchmarking capabilities.) While we've always had good door-to-CT times for acute stroke patients (22 minutes in 2004, compared to the national benchmark of 25 minutes), our ED nurses saw room for improvement. To boost motivation, they devised a quarterly

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contest in which the nurse with the shortest door-to-CT time got a gift certificate to the hospital gift shop. Using this strategy shaved another 4 minutes off our door-to-CT time over the next year. Between July 2005 and June 2006, we shaved off another 2 minutes by changing the procedure so that stroke patients are taken straight from the EMS vehicle to the CT area. Our current door-to-CT time is 16 minutes. Of course, time saved means patients get the treatment they need faster, which helps save lives and reduce disability.

Our ED staff also recognized the need to shorten door-to-needle time—the interval from the patient's arrival in the ED to the beginning of tPA administration. We developed a performance improvement initiative to track this time and presented the tracking data to the pharmacy. Having this data gave us much greater credibility than if we'd simply told the pharmacy we thought it was taking too long to start administering tPA. In response, the pharmacy staff reviewed—and improved—their own process, which has enabled us to cut a few more minutes off door-to-needle time. From July 2005 through June 2006, we dropped below the benchmark of 60 minutes for the first time.

Developing a dysphagia screening tool

The GWTG database also helped us develop and improve a dysphagia screening tool. Before we had this tool, our speech therapists were screening only about 50% of stroke patients for dysphagia (a risk factor for aspiration pneumonia). With guidance from our monthly GWTG teleconferences, we were able to conduct a literature search that helped us develop a customized dysphagia screening tool identifying patients at risk for aspiration. We put at-risk patients on a controlled diet and instructed them on safe swallowing methods or, if needed, we used an alternative feeding method.

As a result, our dysphagia screening compliance rose to 88% and the incidence of aspiration pneumonia fell by about 50% from July 2005 through June 2006. Being able to report this statistic to the staff and administration gave us the chance to dramatically demonstrate the extent to which process improvement affects patient outcomes.

Improving risk factor identification

Thanks to our database, we can now report on risk factors specific to our stroke patients. For instance, we know what percentage are diabetic, and we're managing their care partly by tracking their hemoglobin A1C values (which reflect long-term blood glucose control). Multidisciplinary team meetings and physician department meetings brought these values to the attention of physicians, and we're now seeing tighter blood glucose control. We're also able to track management of patients with hypertension, the leading cause of stroke. Because we can share these data with physicians and other staff, we're seeing more consistent management. Before we implemented GWTG, these quality measures were impossible to track and trend.

Eliminating outdated practices

Using GWTG has led us to eliminate some outdated practices. ASA's scientific statement "Guidelines for the early management of patients with ischemic stroke" provides treatment recommendations, along with clinical evidence to back each recommendation. These guidelines state that:

- anti-embolism support stockings have no proven value to stroke patients
- routine anticoagulation in patients with acute ischemic stroke isn't recommended

- the patient's swallowing reflex must be assessed before he or she can receive anything by mouth.

With this scientific statement in hand, we convinced our physician-leaders and interdisciplinary team to change their admission orders. Consequently, our clinicians stopped ordering anti-embolism stockings for deep-vein thrombosis prophylaxis; instead, we're using sequential pneumatic compression devices. They also stopped ordering heparin drips for virtually all ischemic stroke patients. And we no longer administer medications orally (or allow any other type of oral intake) to patients with suspected dysphagia; previously, our clinicians ordered that these patients be kept "NPO except meds."

Predicting patient disposition

At our primary stroke center, discharge planning starts on admission with assessment of the patient's preadmission functional level. Approximately 50% of our stroke patients are able to return home directly from the acute care department; 20% to 25% are discharged to the acute rehabilitation unit; 8% don't survive the stroke, and the remaining 17% to 22% require placement in an extended-care facility (ECF). Predicting disposition on the first hospital day can reduce stroke care costs by allowing an early start to the time-consuming process of securing an ECF bed.

For guidance in predicting disposition and planning discharges, we turned to the National Institutes of Health Stroke Scale (NIHSS)—a quantitative measure of stroke-related neurologic deficit. Although initially used to determine a patient's candidacy for stroke research trials, NIHSS has been found to reliably indicate prognosis and thus can be used as an early predictor

of discharge disposition. An initial NIHSS score below 10 is linked to a favorable outcome in 60% to 70% of ischemic stroke patients at 1 year after the stroke; a score above 20 portends a favorable outcome in only 4% to 16% of these patients. One study found that an initial NIHSS score of 5 or lower indicates probable discharge to home, scores between 6 and 13 (moderate stroke) indicate probable discharge to an acute rehabilitation program, and scores above 13 (severe stroke) will likely necessitate placing the patient in an ECF.

Garnering awards and recognition

Our facility has received three levels of GWTG recognition—the bronze, silver, and gold Performance Awards. When the hospital newsletter published these awards, our stroke program gained an identity within the hospital. Now when the hospital needs examples of performance improvement or evidence-based practice, it includes stroke program data. Our facility's successful Magnet™ recertification application in 2006 also prominently featured our stroke program.

We've gained regional and state recognition, too. Our facility has hosted many on-site visits and countless teleconferences with other hospitals seeking to improve their stroke care.

The GWTG experience has helped

our nurses become more engaged in the delivery of high-quality care to stroke patients. They now fully appreciate the extent to which nursing care can give these patients the best chance for recovery. In fact, our nursing staff has become so committed to providing high-quality stroke care that membership in the local chapter of the American Association of Neuroscience Nurses has tripled in the past 2 years, and more of our nurses are seeking certification as neuroscience registered nurses.

Pride, purpose, and benefits for all

Our hospital staff is proud that the facility is a certified primary stroke center providing evidence-based care. What's more, the process of obtaining certification has improved our teamwork. Using a quality improvement program and a powerful database has given us a deep sense of purpose and accomplishment, and being recognized as a quality-based program has had a dramatic impact within our facility.

Our experience with GWTG shows that patients, staff, and the entire hospital benefit when scientific research and evidence inform the care of stroke patients. Through GWTG, our stroke treatment has gained an outstanding reputation, and our staff take great pride in knowing we're providing excellent care. ★

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For a complete list of selected references, visit www.AmericanNurseToday.com.

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Purpose/goal: To provide registered nurses with information on how to use evidence-based practices to improve the quality of care for stroke patients.