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# Stroke Center Development: Compelling Evidence of Improved Patient Care and Financial Benefits

Each year, 700,000 people in the United States experience strokes; 500,000 of these episodes are first attacks, and 200,000 are recurrent attacks. Approximately 4.7 million stroke survivors are alive today.

The American Heart Association's recommendation of the use of alteplace (t-PA) to restore blood flow to the area of the stroke spurred stroke center development in the late 1990s and interest continues today. Nationally less than 5 percent of all stroke patients receive intravenous t-PA, but some centers, such as the Stroke Center at Hartford Hospital, are treating 15 percent of stroke patients arriving at the emergency department with t-PA.

The Stroke Treatment and Ongoing Prevention Act (STOP), reintroduced in Congress in late 2003, would authorize $425 million in grant funding for stroke center development. Many hospitals are attempting to capitalize on the stroke market opportunities. Almost 300 stroke centers in the United States are listed on the Internet Stroke Center directory.

CLICK HERE
to view information from the National Institute of Neurological Disorders and Stroke

## Types of Stroke Centers

The Brain Attack Coalition identifies two levels of stroke centers: primary stroke centers and comprehensive stroke centers. Primary stroke centers, common in community hospitals, stabilize and provide emergency treatment for patients with acute stroke. These centers transfer the patient for further care depending on the center's capabilities. Many tertiary centers offer a comprehensive stroke center that provides stroke care for patients who require specialized testing and other complex surgical and endovascular interventions. The number of these interventional procedures has grown in recent years as patients are referred to these settings for advanced treatment.

CLICK HERE
to view information from the Internet Stroke Center

Individual market characteristics influence the need for stroke center development. Stroke incidence rates vary dramatically based on lifestyle issues, such as smoking and obesity, and other factors. In the southeastern "stroke belt" stroke rates can be double the rates in other areas of the country. Inner-city neighborhoods typically have higher rates than adjacent suburban areas. African-Americans have almost twice the risk of first-time stroke compared with whites. Age is a key factor as well, with 72 percent of strokes occurring in people age 65 or older.

## Costs of Care and Reimbursement

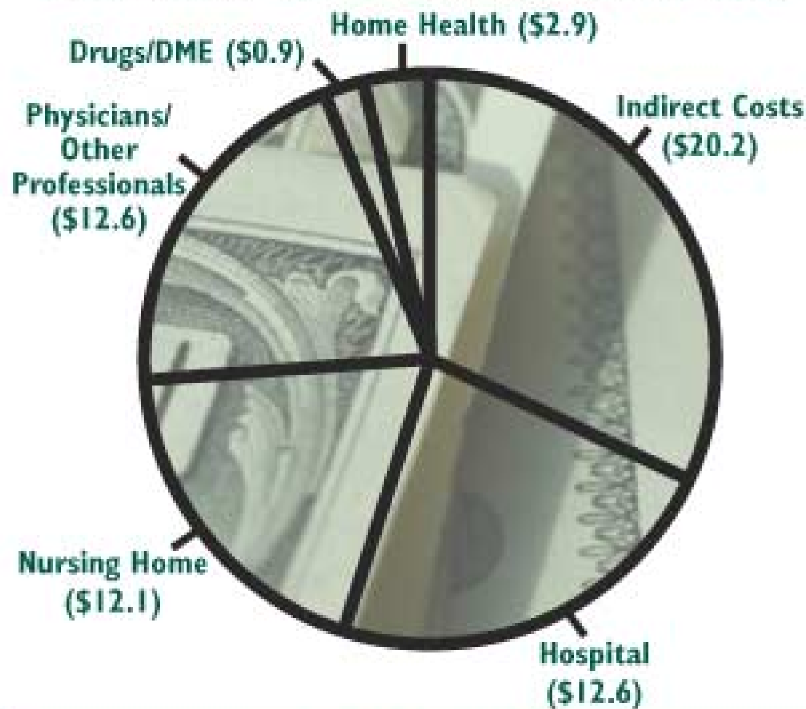
CLICK HERE
to view stroke publications from the American Heart Association

Direct health care expenses for treating stroke patients rose from $26.3 billion in 1997 to $31.0 billion in 2003. Hospitals spend approximately half of their stroke resources on routine intensive care unit and medical-surgical room expenses, 20 percent for neuroimaging evaluation (e.g., CT/MRI, angiography, neurovascular sonography), 20 percent for stroke patient management (labs, pharmaceuticals, supplies, etc.) and 10 percent for rehabilitation therapies and preadmission activities.

Hospitals are reimbursed approximately $12.6 billion,

which is 40 percent of the direct expenses for stroke care. These revenues typically result in a contribution margin of approximately $3,000 to $3,500 per inpatient case. Most stroke patients also require substantial post-discharge follow-up. Approximately half of stroke discharges will require inpatient rehabilitation and two-thirds will require outpatient rehabilitation, typically 20 or more visits per patient. A typical stroke patient will generate $15,000 to $20,000 in net health care revenues within 90 days of his or her stroke.

CLICK HERE
to view information from the American Stroke Association




CLICK HERE
to view information from the National Stroke Association

## Stroke Center Components and Infrastructure

CLICK HERE
to view information from the Brain Attack Coalition, a group of professional, voluntary, and government entities dedicated to reducing the occurrence, disabilities, and death associated with stroke

An acute stroke team is an integral part of a successful stroke center. The team should include representatives from neurology, neurosurgery, emergency medicine, radiology (preferably neuroradiology), and rehabilitation medicine. In addition, the team will need additional support from other subspecialists for some cases. Effective stroke care requires multidisciplinary collaboration. Stroke programs organized exclusively

within a single area, such as the ED, neurology, and nursing, are not likely to succeed. Most stroke centers have a medical director and a nurse coordinator to oversee the program and encourage involvement from various clinical disciplines.

Infrastructure, especially streamlining processes and systems, is a key to success for any stroke center. Stroke centers need written protocols (ED and inpatient), a stroke data registry, time-to-treatment logs, transfer agreements, and protocols for post-discharge follow-up. Achieving the goal of t-PA administration within one hour of ED arrival (i.e., a 60-minute "door-to-needle" time) depends on rapid activation of the stroke protocol, stroke team response time, and imaging and lab results turnaround. A growing number of stroke programs offer dedicated stroke inpatient units, but many centers operate without dedicated facilities. Most successful stroke centers are also active in stroke prevention and education in their communities.

The business case for stroke center development is compelling, but many of the benefits are non-financial in nature. Several studies have shown that outcomes, access to treatment, complication rates, and patient satisfaction are better in stroke centers than in hospitals without stroke programs.

For more information on stroke centers, please contact Christie Markham or Alan Zuckerman, or call 215-636-3500.

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