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# The Implementation of an Innovative Statewide Quality Improvement Initiative

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## ABSTRACT

Acute stroke can result in neurological impairment and potentially death. The Colorado Stroke Alliance has made significant progress in improving stroke care through their statewide quality improvement efforts. The following provides an overview of how this effort has come to fruition. Included is an overview of the collaboration, an explanation of the organizational structure, the source of funding, a description of the statewide quality efforts improvement including mentoring and data reporting, and an overview of nursing involvement. This discussion highlights how a relatively small task force has transformed into a growing nonprofit organization, becoming a model for best practices.

Acute stroke can be a costly and resource-intensive condition. In the United States, it is the third leading cause of death, and more than 160,000 people die each year from stroke. In 2005, it resulted in nearly \$57 billion in both direct and indirect costs (Centers for Disease Control and Prevention [CDC], 2008).

In Colorado, ischemic and hemorrhage strokes represented 85% and 15% of the strokes, respectively, from 1999 to 2001 (Colorado Stroke Advisory Board [COSAB], 2003). Patients with a primary diagnosis of stroke anecdotally received the thrombolytic therapy tissue plasminogen activator (t-PA) only 1.1% of the time, with an average of 88 patients being treated each year. The national rate for recombinant t-PA use was 3% (COSAB, 2003).

In addition to the above, Colorado hospitalizations for stroke diagnosis increased by 4.5% between 1999 and 2001. The length of hospital stays for stroke decreased by 3.5%, from 5.93 to 5.73 days, during the same time. Payments to hospitals for stroke treatment increased an average of 12% per year, from \$15,786 to \$19,701. Hospital payments were 2.4 times greater for hemorrhagic stroke than for ischemic stroke (COSAB, 2003). In light of these facts, the idea of implementing a statewide stroke registry to support quality and process improvements appeared to be justified to support the efforts of improving patient care, reducing the incidence of stroke, and potentially lessening the financial burden of stroke.

## Background

In 2002, the Colorado Stroke Advisory Board (COSAB) was formed in response to a mandate from the Colorado state legislation. The COSAB was composed of subject matter experts, hospital representatives, public health officials, nonprofit healthcare organization representatives, and a variety of healthcare providers and stroke survivors. The COSAB was charged with evaluating the status of stroke care in Colorado and to formally present any opportunities for improvement to the state legislature.

To accomplish this, the COSAB reviewed stroke data that were available from a variety of sources, including the Colorado Department of Public Health and Environment (CDPHE), American Heart Association (AHA), American Stroke Association (ASA), National Stroke Association, and the Colorado Hospital Association. After reviewing the data, as well as other resources on stroke, the COSAB published the "Stroke in Colorado" report in 2003 (American Heart Association [AHA], 2008;

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American Stroke Association [ASA], 2008; CDC, 2008; Colorado Department of Public Health and Environment [CDPHE], 2008; Colorado Hospital Association 2008; National Stroke Association 2008).

The "Stroke in Colorado" report culminated in five recommendations for improving stroke care in Colorado. One recommendation called for the implementation of a statewide stroke registry. The recommendation highlighted the need for statewide stroke data for benchmarking and identifying specific opportunities for focused quality improvement efforts. It was recognized that without baseline data efforts to enhance quality or process improvement efforts would be hampered. The benefits of a statewide stroke registry that focused on real-time data collection that would contribute to determining a current and accurate picture of stroke care in Colorado. As noted in the "Stroke in Colorado" report (COSAB, 2003), the existing state of stroke care in Colorado, including the incidence rate, was not clear:

The precise number of strokes each year in Colorado is uncertain, but at a minimum, it includes the following: mild strokes not requiring hospitalization (number unknown), non-hospitalized stroke deaths (hundreds of deaths annually), hospital admittances due to a stroke, and strokes which occur during hospitalization for another primary cause. Because several of these numbers are unknown, there is no way to calculate an accurate stroke rate. (p. 23)

The establishment of a statewide stroke registry would help to solve this dilemma. This would in part be accomplished through the use of real-time aggregate data that would allow for and support the development of statewide quality improvement projects.

### Planning the Stroke Registry

After the publication of the "Stroke in Colorado" report, several members of COSAB continued to meet on a monthly basis to plan the implementation of the Colorado Stroke Registry. Discussions included the potential for facilitating a legislative mandate for statewide participation in a stroke registry, determining the cost of initiating and maintaining a registry, exploring potential funding resources, and defining barriers and potential solutions for successful implementation. The largest barrier became how to "sell" hospitals and legislators on the value of the information to be gleaned from a registry. One solution that was identified

was to provide a small stipend to participating hospitals. This would assist in offsetting the costs and additional financial burden that hospitals would bear in data collection and submission. COSAB members researched other statewide registries to identify challenges and barriers associated with those projects to avoid duplicating those issues.

Early on it was also determined that a legislative mandate for a statewide stroke registry was not feasible. The political environment did not appear to be supportive of a mandate such as this. It was proposed that a stroke registry be launched as a pilot project to assess whether the establishment of a statewide stroke registry would be feasible. In addition, funding at the state level was not available for such a project and mandating a stroke registry was not a priority item.

This led to detailed discussions regarding hospital participation and how to reassure hospitals that participation would not result in punitive or competitive damages. It was recognized that data and reports could potentially be used by participants to attempt to influence their market share and patient referral patterns. At the time, mandatory report card systems and mandatory reporting of stroke performance indicators were not in place. Other issues included the following: How would data sharing occur? How could data be reviewed while avoiding the potential exploitation of the data for hospital market share advantage? Where would the data be stored? How would the program be funded? These questions were developed and explored by members of the COSAB during the strategic planning process. The COSAB performed due diligence to address such possible questions in an effort to promote the success of the program.

One of the greatest challenges that the COSAB had to address was to reassure all parties that the COSAB was inclusive and not run by any one organization or by the State Department of Health. Colorado is a highly competitive state, and any perception of competitive bias or State Health Department ownership could have significantly affected implementation. Similar to other states, healthcare providers are aware of the competitive nature of the healthcare industry, including access to patients, service line offerings, and market share. Although not unique to Colorado, the COSAB was attentive to addressing these potential concerns early during the implementation.

One of the COSAB's first definitive steps was to create guidelines that defined equal representation of all members. No single entity, whether hospital, business, or individual, has more power or credibility than another in COSAB decisions or direction.

Bylaws were established that mandated neutrality by all participants and restricted any member from promoting any specific organization during COSAB meetings. All members were initially required to sign participation agreements that explicitly defined COSAB membership as being citizens of Colorado, not representatives of their respective hospitals or organizations.

### Neutral Entity and Grass Roots Effort

Because the COSAB represents a variety of organizations (Table 1) and does not promote any single entity or system over another, it is considered a neutral entity. The COSAB is also considered a grass roots effort. Hospitals that are participating in the COSAB voluntarily submit their data into the AHA's Get With the Guidelines stroke program. The program is an Internet-based software application that incorporates evidence-based guidelines to support providers in providing optimal stroke treatment. The program allows for real-time data entry and data reporting. The program offers evidence-based guidelines and suggestions for treatment based on the data that are entered.

The stroke registry is essentially a "data cooperative" that is intended to support hospital-level and statewide quality improvement efforts. To our knowledge, no other state in the country has been able to successfully incorporate the input of more than 30 hospitals in less than 2 years to produce positive stroke outcomes on a statewide basis.

**TABLE 1.** Examples of Collaboration With Stakeholders

Colorado Department Public Health and Environment
American Heart Association/American Stroke Association
Outcome (vendor for Get with the Guidelines Stroke program)
National Stroke Association
Easter Seals
Colorado Neurological Institute
Spalding Rehabilitation Hospital
Rocky Mountain Stroke Association
Colorado Area Health Education Centers
Colorado Foundation for Medical Care
Colorado Clinical Guidelines Collaborative
Emergency medical service agencies (e.g., Rural Metro Ambulance, Cunningham Fire Department)
Colorado Hospital Association
Blue Sky Neurology

**TABLE 2.** Colorado Stroke Alliance Participating Hospitals as of June 23, 2008

Hospital	Hospital
Boulder Community Hospital	Presbyterian/St. Luke's Medical Center
Community Hospital	Prowers Medical Center
Conejos County Hospital	Rangely Hospital District
Denver Health Medical Center	Rose Medical Center
Exempla Lutheran Medical Center	San Luis Valley Regional Medical Center
Family Health West	Sky Ridge Medical Center
Haxtun Hospital District	Southeast Colorado Hospital District
Keefe Memorial	Spanish Peaks Regional Health Center
Littleton Adventist Hospital	St. Anthony Central Hospital
Medical Center of Aurora	St. Anthony Hospital - North
Medical Center of Rockies	St. Anthony Summit Medical Center
Melissa Memorial	St. Mary Corwin Hospital
Memorial Hospital	St. Mary's Hospital
Mt. San Rafael Hospital	St. Vincent General Hospital
North Colorado Medical Center	Swedish Medical Center
North Suburban Medical Center	The Memorial Hospital
Parkview Medical Center	University Hospital
Penrose St Francis Hospital	Wray Hospital
Poudre Valley Hospital	Yuma Hospital District

The culture of the COSAB promotes inclusiveness. Participation in the COSAB is open to any Colorado hospital, regardless of bed count, annual stroke discharge volume, or geographic location. Because of this, the composition of participating hospitals includes a mix of urban, rural, and frontier hospitals (Table 2 and Fig 1). COSAB membership also includes a variety of stakeholders, such as nonprofit organizations, physicians, and representatives from rehabilitation hospitals, private industry, and public health departments (Table 1).

### Data Collection

One of the first topics reviewed by the COSAB was data collection. After evaluating several options, the AHA's Get With the Guideline's Stroke Patient

FIGURE

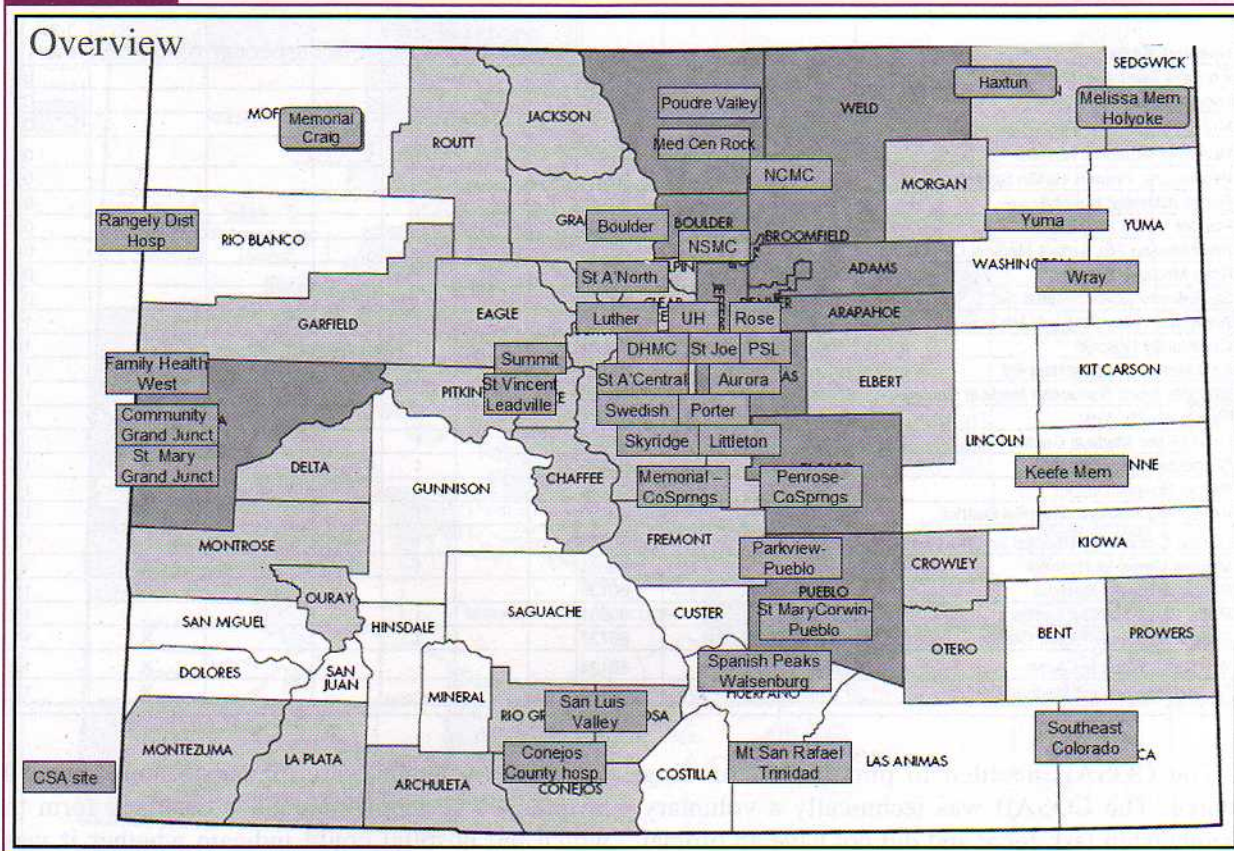
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**FIGURE 1 Colorado Stroke Alliance Sites as of August 22, 2008**

Management tool (GWTG-Stroke) was selected as the data collection program. The Patient Management Tool is supported by Outcome, which is a company located in Cambridge, MA. The GWTG-Stroke program is a Web-based software application that incorporates evidence-based guidelines for the acute treatment of stroke patients. Because the program is Web based, software does not need to be installed on any computer. This is important because the hospital's information technology department involvement is minimal. As long as the computer will allow the user to access the GWTG-Stroke Web site, the program can be accessed at any time. Bypassing the need for the installation of software also assists in reducing the time that is needed for the hospital to go "live" with the program.

In addition, real-time data can be collected and reported. The GWTG-Stroke program allows hospitals to see their hospital-specific data. Hospitals can enter their data and immediately query their data to identify trends in their progress and compare their own organization's performance with that of a variety of benchmarking groups.

The COSAB has a "superuser" account to view and report de-identified data on a statewide basis.

This distinction does not allow the identification of the hospital, patient, or provider and allows the generation of statewide stroke reports. By using de-identified data, hospitals are reassured that the COSAB will remain a neutral reporting entity and individual hospitals will not be able to use the information in marketing efforts to compete against other hospital organizations.

### **Funding Opportunity**

As the COSAB continued to make progress creating the framework for the stroke registry, one key item remained outstanding: funding. Interestingly, a solution to this challenge was developing at the same time the COSAB was planning the registry.

The State of Colorado was in the process of proposing a tobacco tax. Referred to as Amendment 35, if approved, a percentage of the funds raised by the taxes would be invested in the Colorado healthcare system. The tax was approved in 2004 by Colorado voters, and new funds became available for healthcare projects related to cancer and cardiovascular and pulmonary diseases. Beginning in 2006, a portion of the tax dollars was set aside for a competitive grants process to support initiatives that would positively affect these specific disease processes.

