IT Applications for Stroke:
What is Data Preventing You from Doing?

By Michael Church

Healthcare, like the rest of the world, is continuing to become more reliant on information technology. The myriad solutions that are available in today's market present unique opportunities and their own challenges. Many service lines have reached a point where utilizing a boutique technology solution to manage their specific data needs is expected. Cardiovascular Information Systems (CVIS), for instance, have been around for decades now, with dozens of options available. Part of this is driven by the requirements to submit information. Currently, approximately half of the states in the country have regulations in place specifically governing how and where certain cardiovascular services can be provided, often including a provision that key data is reported to an entity such as the National Cardiovascular Data Registry (NCDR) or Society of Thoracic Surgeons (STS).

Interestingly, regulations related to stroke and neurosciences seem to be expanding, yet there has not been a surge of programs looking to manage data in a different way. Most regulations for stroke are based on bypass protocols for EMS, which state that patients **suspected** of having a stroke must be taken to a **certified** stroke center for treatment. For example, in Corazon's home state of Pennsylvania, this bypass is required by law and in states like Texas and Washington, there are established networks of care to promote better stroke care with more rapid access. In both scenarios, accurate and timely data is necessary. Most certifying bodies, including The Joint Commission (TJC), Healthcare Facilities Accreditation Program (HFAP), and Det Norske Veritas (DNV), require some level of data for the stroke program accreditation or certification process. Of course, many stroke programs also submit data to the Get With The Guidelines®-Stroke (GWTG) registry (1,656 hospitals since its inception in 2003).[2] While the GWTG registry does provide value to hospitals, it can often be a time and resource intensive process to maintain.

All of this begs the question, what applications or information technology resources are available to stroke clinicians and program administrators? The short answer is, "Not many." The vast majority of applications related to stroke are geared toward the post-stroke patient seeking rehabilitation tools for aphasia, communication, medication reminders, and more. There are some tools that provide guides or education for clinicians, but they are limited in scope and disconnected from the rest of the hospital's IT infrastructure. It is this environment that led Corazon to develop the **CEREBROS™ Neurovascular Information System**, to collect data in a way that elevates the care

within stroke programs by having immediate access to digital information and comprehensive program data.

For many hospitals, time-intensive and manual data abstraction and management has been accepted as a necessary evil for stroke programs. But is it necessary? And what is the actual impact on the stroke programs?

Mind the (Information) Gap

The burden of stroke data collection has largely been addressed by developing homegrown tools by individual stroke coordinators or programs using readily available, office-based, programs like Microsoft (MS) Excel or Access. However, the inability of these approaches to communicate with other hospital systems means that each required data point must be entered manually. If the person managing this data is savvy, they can create some linked information through MS Access, but that is more the exception than the rule. Corazon has interacted with more than 200 stroke programs over the last decade and our team repeatedly discovers the same finding – the stroke coordinator has to maintain multiple separate documents to record and report on their stroke data, with separate spreadsheets for each purpose. For some hospitals, this can include:

1) GWTG reporting,
2) Core Measures for certification,
3) State reporting,
4) Research studies (possibly more than one at a time),
5) Internal stroke log,
6) Quality improvement initiatives,
7) Information for stroke team meetings,
8) Physician-specific information,
9) And others, as needed.

Some of these reports can feed data into other reports, and some may be able to be combined, but there are still at least eight easily identifiable needs for data within a stroke program. That is also not counting the information already entered into the hospital's Electronic Medical Record (EMR). **Even in ideal circumstances, without an interfaced patient management system and central database like CEREBROS™, the information will be entered multiple times.** Every time this information is transcribed, this represents an opportunity for errors to occur, which in turn necessitates greater monitoring and validation of the data entry processes as well.

The intent of gathering data from patients and their care is to improve quality. Clinicians want to be able to measure performance, independently and compared to others, and set goals. Whether through course corrections within a patient's stay or by helping a program to identify strategic initiatives for growth, data is supposed to be rewarding. For instance, one of the reports in CEREBROS™ tracks mode of arrival for stroke patients. With the simple pie chart generated by the report, a hospital can quickly recognize if most stroke patients are arriving via self-transportation, pre-hospital provider, or transfer. Depending on what is presented in the data, this may indicate a need to educate the community about recognizing stroke symptoms and calling 911 immediately for stroke, or to conduct further outreach and collaboration with pre-hospital providers.

> *Without the ability to quickly and easily manipulate and present data, the stroke program quickly becomes bound to data collection, rather than empowered by it.*

What is Standard?

There is also still the issue of standardization and accuracy. GWTG is likely the most prolific data repository for stroke today. It can also be a time-intensive commitment for a program, largely due to its strict and ever-changing data entry requirements. Patient information needs to be stored in a defined format by participating hospitals and connected to field names set by GWTG. However, this standardization is the key to comparative metrics and the ability to aggregate data from multiple sources for research purposes. No matter what system is being used, it is easier and more accurate to report and analyze information in an established format than in "free text" fields.

Unfortunately, the tools being used by many programs – Excel and Access – are not automatically configured for standardized data entry. Each of these programs has a high degree of functionality, but their use is reliant on the expertise and experiences of each individual hospital's staff (or the staff that may have responsibilities across a health system). Clinical information systems, like CEREBROS™, are developed using each company's experience with a multitude of clients across the country. This foundation can lead to a better understanding of best practice, trends, and key analytics to evaluate. A national perspective also lends value relative to clinical best practice, whether through the information captured, processes or workflows built into a system, or the benchmarks set and monitored for the stroke program.

Decreased standardization also increases abstraction times. If information can be stored in multiple locations, or if it can be buried within a block of free text, it means the data abstractors have to put forth that much more effort to locate and extract the information. Automation of data sharing is also dependent upon standardized formatting. It is possible to develop interfaces between systems, particularly with the hospital's EMR, but the interface is always dependent on the data format. That said, even if only 50% of a record is in discrete (standardized) fields, that means the data abstraction burden has already been cut in half, as has the risk of errors in transcribing information from one location to another. For stroke programs, where resources can already be very scarce, this allows them to be redeployed where they are most valuable. Given how quickly stroke and neuroscience services are changing today, that is an important perspective to bear in mind.

Focusing on Stroke Program Development

As it has already been widely reported, beginning with the MR CLEAN trial published in early 2015, and supported by the SWIFT PRIME, EXTEND IA, ESCAPE, and REVASCAT trials, there is a growing focus on endovascular treatment for stroke as a viable, and even preferred, option.[3] While research into this topic continues in earnest, there is no denying that stroke programs are looking at ways to augment their current capabilities. Expanding patient selection criteria and changing treatment recommendations are creating an environment ripe for stroke program expansion. The belief that only tertiary and quaternary medical centers could consider endovascular treatment options is no longer valid. This expansion of more comprehensive programs will also increase the data burden, both in the amount of information collected per patient and the total number of patients.

With the service expansion, there is also the issue of finding the right physicians to support a new program. The Society of Vascular & Interventional Neurology (SVIN) and the Society of Neurointerventional Surgery (SNIS) are collaborating on how to best prepare the next generation of interventional neurologists. Other studies are researching the demand and supply for these subspecialists.[4] All of these factors – capabilities, clinical and industry changes, technology, and manpower – must be evaluated as a whole to understand how programs can grow to meet the needs of stroke patients tomorrow, as well as today.

Patients are also becoming savvier with regard to stroke treatment options. In February of 2018, *The Wall Street Journal* published an article detailing the positive difference that endovascular treatment can make for stroke patients.[1] Articles about thrombectomy continued to show up in *The Wall Street Journal* and other publications throughout the year. While the information reported was not revolutionary for healthcare providers, it does increase awareness of stroke care and prompts new or different expectations from the general public.

All of these components are important to consider. Advancing them requires a great deal of work from the leader of the stroke program, who is also very busy with managing day-to-day data and fighting with disparate systems to generate meaningful reports. The primary goal of a stroke coordinator or manager should be to ensure that patients are receiving the best care. However, they become inundated with activities related to meeting stroke

program certification requirements. Great stroke program leaders are empowered to promote high quality care, consistency, access, education, collaboration, and more. The interdisciplinary team supporting the stroke program should also have these goals and should have the skills to advance the standard of care at a given organization. <u>In order for any of this to become a reality, though, the stroke program must have the support of senior leadership.</u>

> ***With the right tools, stroke team members are better able to focus on the most meaningful parts of their jobs, which will bring greater value to the patients and the hospital.***

Finding a Solution

Based on all of these factors, what are steps that a stroke program can take to address these needs? First and foremost is to empower the stroke coordinator, manager, or team to explore options that exist. Systems like CEREBROS™ have been developed specifically to address the needs of primary and interventional stroke programs to streamline and automate data management. Furthermore, tools like this can also empower teams to make real and meaningful changes or improvements to the program. There is an adage that, "clinicians need to stop working for their data and make the data work for them." Those programs which are able to gain a foothold sooner than later will be on the leading edge of the new paradigm for stroke and neurosciences care.

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