Do Primary Stroke Centers Occur Randomly?

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When the Brain Attack Coalition began to publish recommendations for the development of Stroke Centers, they chose to begin with primary stroke centers (PSCs), in the hope that such centers would impact the largest number of patients in the shortest period of time. Currently, in the United States, there are >1000 PSCs certified by the Joint Commission, and likely several hundred more certified by other private agencies (ie, Healthcare Facilities Accreditation Program and Det Norske Veritas), as well as some state health departments. Considering there are slightly >5000 acute care hospitals in the country, this means that ≈25% of hospitals in the United States are a PSC. This represents a significant advance in stroke care over a little more than a decade since the Joint Commission began their PSC certification program.

As McDonald and colleagues note, PSCs are associated with many improved important outcomes (reduced death and disability, higher rates of utilization of intravenous tissue-type plasminogen activator), as well as better compliance with several other stroke care measures as tracked by Get with the Guidelines-Stroke. It is now common, if not routine, for some cities and some regional emergency medical service providers to divert patients with a suspected acute stroke to the nearest PSC or Comprehensive Stroke Center. Emergency medical services routing to PSCs may also be a factor in motivating some hospitals to become a PSC so that they do not get by-passed.

When the Brain Attack Coalition first published guidelines for PSCs, there were concerns about if and how hospitals within a city or region would allocate resources and compete to become a PSC. These concerns were largely unfounded because most medium and large urban areas now have several certified PSCs that compete for patients. Even small urban areas often have one or more PSCs. This is likely a positive development because patients now have many options for acute stroke care in most cities, giving them freedom to choose the care facility that is best for them (to the extent that they have a choice in the matter). It also means that stroke care in many cities has improved to the extent that it now supports several hospitals that meet the various criteria to become a PSC. Of course the PSC cannot be viewed in isolation; it is one component of a larger and more complex Stroke System of Care, which now includes Comprehensive Stroke Centers, Acute Stroke Ready Hospitals, emergency medical services, and other entities. However, the PSCs play a key role because they are the most prevalent type of stroke center.

In the current study, the authors have identified several important and novel factors that seem to correlate with designation as a PSC. These include hospital bed number, population size, presence of a hospital-based neurology service, and household income. Stroke (cerebrovascular disease) is the eighth most commonly discharged Diagnosis Related Group based on national data (see http://www.ahrq.gov/). Thus, most large- or medium-sized hospitals will likely admit several hundred patients with cerebrovascular disease each year. These hospitals might realize that providing better care to this substantial patient population would result in improved outcomes, reduced length of stay, and a positive marketing message. Thus, most hospitals have a vested interest in improving the care and outcomes of patients with such a common condition.

The negative association of PSCs with county hospitals likely reflects a relative lack of resources (financial and others) at these hospitals and perhaps a lack of focus by their administration in treating this important patient population. This is counterintuitive and perhaps short-sighted, because such hospitals likely see a large number of these patients, and improving their care and outcomes would likely reduce other expenses (LOS, nursing home placement, recurrent stroke) and perhaps result in fewer readmissions.

The authors note that in their sample of >3000 responding hospitals, only 31% were PSCs. This is slightly better than my estimate of ≈25% of all acute care hospitals being PSCs. Either way, this is actually a rather high number of facilities. Would we expect that every hospital or even half of all hospitals would be a PSC? Are most hospitals trauma centers or burn centers? Many if not most PSCs see 300 to 400 patients per year, although some see many more and some far fewer. There is clearly some economies of scale that justify amortizing the expenses of becoming a PSC across a specific number of patients. However, for smaller hospitals, it might not make economic sense to invest in the infrastructure and staffing to become a PSC to care for only 50 or 75 stroke patients annually.

Perhaps the major issue is not the number of PSC facilities but their distribution. A study by Leira et al showed that in Iowa, optimal coverage of the population could be achieved if some entity or agency could direct the location of such facilities, instead of having market forces and other groups make such decisions. In that regard, it might be interesting to analyze if and how proximity to one PSC might have influenced the formation of another PSC. Healthcare in general and hospitals in particular are competitive entities. Once one hospital in an area becomes a PSC, we have seen others then seek similar
certification. Although the McDonald study showed a correlation between population centers and PSCs, it would be of interest to know if and how proximity to one PSC might have affected the formation of other PSCs. This dynamic might be one factor driving the uneven distribution of hospitals noted by Leira and colleagues.10

A significant minority of hospitals in the United States are now certified as PSCs. This has resulted in improved care and outcomes for millions of patients over the past decade. Although the number of certified PSCs may increase somewhat over the next few years, perhaps a more pressing issue (and achievable outcome) would be to make sure that more patients are triaged to the >1000 certified PSCs in a rapid and efficient manner. We know this can be done, and we know that our patients will benefit from such an intervention.

**Disclosures**

Dr Alberts is an unpaid consultant for the Joint Commission and Healthcare Facilities Accreditation Program and is a paid speaker for Genentech, the maker of TPA.

**References**


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