Door-to-Needle Times
Let’s Not Leave Smaller Hospitals Behind

Eric E. Smith, MD, MPH

See related article, p 1275.

In this issue of Stroke, Strbian et al present disappointing data on door-to-needle times (DNTs) for tissue-type plasminogen activator (tPA) from the Safe Implementation of Thrombolysis in Stroke (SITS) registry. Not only was the median DNT 67 minutes long, but also there was little overall change from 2003 to 2011 (see Figure 1 of Strbian et al). This means that more than half of patients were treated >60 minutes after emergency department arrival, an unacceptably long interval.

DNTs in North America in this time period were slightly longer. In the US national Get With The Guidelines-Stroke (GWTG-Stroke) database, median DNT from 2003 to 2009 was 78 minutes. In the Registry of the Canadian Stroke Network, median DNT from 2008 to 2009 was 72 minutes.

However, hidden within these overall disappointing data there is a glimmer of hope. The largest volume hospitals in SITS, treating >75 to 100 patients per year, had not only lower times overall but also a deep and sustained drop in DNT over time.

The earliest joining large hospitals, treating >100 patients per year, experienced a decrease in median DNT from just >50 minutes in 2003 to ≈30 minutes by 2008, followed by a sustained plateau through 2011 (Figure 2 of Strbian et al). Similar but not as dramatic decreases in DNT can be appreciated in hospitals treating 75 to 99 patients per year (Figures 1B and 2 of Strbian et al). Statistical modelling, adjusted for all covariates, confirmed a highly significant interaction between calendar year and hospital tPA volume, with the higher volume hospitals experiencing much larger decrease over time in DNT compared with smaller volume hospitals (Table II in the online-only Data Supplement of Strbian et al).

Clearly, these larger hospitals have, over time, learned how to shorten their DNTs. The problem is that because there are few large volume hospitals, most patients are treated at the smaller volume hospitals that struggle to give tPA rapidly. Among the early adopters joining the registry in 2003, 81% of the patients were treated at hospitals with tPA case volumes <75 patients per year and 49% were treated at hospitals with tPA case volumes <25 patients per year (Table 1 of Strbian et al). Registry growth from 2006 to 2011 has almost exclusively consisted of new small volume hospitals. In 2009 to 2011, 84% of newly joining hospitals treated <5 patients per year.

The challenge, then, is how to transfer DNT best practices from large hospitals to small hospitals. This knowledge transfer could occur in the context of professional conferences, symposia, and webinars. Registries, such as SITS and GWTG-Stroke, can facilitate such knowledge exchange among their member hospitals.

However, not all best practices at larger volume hospitals will transfer directly to smaller volume hospitals. Hospital strategies associated with shorter DNT have been studied, but not stratified by hospital case volume. Smaller hospitals have their own, unique challenges, including fewer resources, smaller stroke teams, lack of specialists, absence of trainees, and less case volume with which to build experience. In many cases, smaller hospitals need to access stroke specialist expertise via telestroke. To facilitate transfer of knowledge of best practices by smaller volume hospitals, more research is needed on the distribution of DNT within these hospitals to see which are consistently capable of giving tPA quickly. These high performing smaller volume hospitals could be surveyed to identify their secrets for success, which could then be disseminated to their peer hospitals. In addition, more research is needed to identify the factors affecting DNT in telestroke.

Certification programs could provide incentives for smaller volume hospitals to acquire the knowledge and skills to give tPA rapidly. The American Heart Association/American Stroke Association-sponsored Target: Stroke program successfully reduced DNT from 74 minutes in 2009 to 59 minutes in 2013; given the findings of Strbian et al, it will be important to analyze whether DNT improvements in Target: Stroke were seen in all hospitals or were limited to larger hospitals. The ongoing Reduction of In-hospital Delays in Stroke Thrombolysis (SITS-WATCH) study seeks to reduce DNT to <45 minutes in SITS hospitals (clinicaltrials.gov NCT018119001).

Currently, many large, academic hospitals are focusing their efforts on reducing DNT to the bare minimum. The question for these centers is: how low can we go? However, let’s not leave smaller hospitals behind—collectively, they are treating many stroke patients.

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References


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