

# Stroke treatment: metrics and processes

Tratamento do AVC: métrica e processos

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The proportion of cerebral infarct patients receiving intravenous thrombolysis is a sensible and logic marker of stroke care quality. A high number of treated patients reflects fast collaborative work in acute stroke-ready hospitals<sup>1</sup>. Typically, these hospitals have structured acute stroke teams, carefully studied and written protocols, fast laboratory and neuroimaging testing, and exhibit major involvement of emergency medical services and personnel<sup>2</sup>.

Increasing the number of IV rT-PA treated patients should be considered a high priority for acute stroke hospitals. This depends on a coordinated effort of policy makers, Health insurance companies and local facilities. Federal, State and local Government should be responsible for adequate funding of public services, human and technological resources (e.g., telethrombolysis, immediate rescue of patients in remote areas); coordinate different public and private agents (e.g., primary or comprehensive stroke centers and more simple facilities benefiting from effective telemedicine use and drip and ship strategies); legislate and supervise the adequacy of services provided, and improve public education about stroke signs and symptoms, preparedness and effective action<sup>1,3</sup>.

Any hospital dealing with a significant number of acute stroke patients should carefully develop and control the processes involved. Ideally, this should include all evaluation and treatment phases - from pre-hospital management to post-discharge care and rehabilitation<sup>4</sup>. Such comprehensive approach leads to a higher proportion of patients treated with rT-PA<sup>1</sup>, better results, and cost savings<sup>5</sup>. International societies have developed criteria to certificate institutions involved in stroke care and provide guidance on how to prove excellence in care<sup>6,7</sup>.

The processes involved in the initial evaluation and treatment of acute stroke patients is the object of the article by Li and Johnson published in the present number of *Arquivos de Neuropsiquiatria*<sup>8</sup>. The authors focus on the hyperacute phase assessment and management. They emphasize the need of a critical evaluation of the chain of steps that may constitute barriers to speed the use of IV rT-PA. Improvement of those steps, gaining more time and leading to a higher number of patients treated within the golden 90 minutes-window is suggested. They provide references from institutions that have achieved a significant decrease in average onset-to-treatment time (OTT) to IV thrombolysis. Unfortunately, this does not necessarily result in better outcomes. These somewhat deceiving final results could be due to a non-significant increase in the proportion of patients treated within the 90-minute frame.

Constant effort to improve workflow metrics should be part of the institution's commitment to high-quality stroke management. It should be acknowledged, however, that mean or median OTT cannot tell us the whole story<sup>9,10</sup>. Central tendency measures may represent a final result of divergent forces: greater symptom recognition by the public and more efficient hospital processes, and, on the other hand, the parallel inclusion of more patients in the extended 3 to 4.5 hour-window.

Li and Johnson also propose the use of a specific approach – Lean-Six-Sigma – to rationally speed the management processes emphasizing on-site observation of the entire chain of steps<sup>8</sup>. This is followed by preferential intervention on those steps that can add most value – i.e., speed – to the process. The method has already been applied to hospital processes<sup>11</sup>. Unfortunately, we are left without any details of the proposed approach in the setting of hyperacute stroke, as the only reference cited – from the same authors – is yet to be published<sup>12</sup>. The general idea of improving the steps with greater impact on OTT is of course reasonable and

the authors should be acknowledged for highlighting this. Pre-hospital and in-hospital processes are not equally sensitive to intervention effects<sup>13</sup>.

Some specific interventions are known to speed processes. Increasing the availability of emergency ambulance transport can very be effective in reducing time to admission after stroke onset<sup>14,15</sup>. Using CT instead of MRI may also have a great impact on time to intravenous as well as intra-arterial treatment delivery<sup>16</sup>. Simple text-messaging interventions directed to residents leading stroke teams have been associated with reduced door-to-needle time<sup>17</sup>. Sometimes, the consistent provision of available resources can reduce time-related differences in care received by patients admitted off-hours<sup>18,19</sup>.

Keeping in agreement with key Brazilian and International guidelines is a logical way to improve the quality of care in acute stroke. Costs may be reduced by this approach<sup>5</sup>, helping managers to direct funding to additional improvements. A number of publications help to set standards of care in different settings<sup>2</sup>. Reliability and consistency in all treatment phases is the key to quality, and it is considered the main institutional goal by International accreditation programs as mentioned before<sup>7,8</sup>. The whole chain of processes (from pre-hospital to rehabilitation and secondary prevention) should be constantly monitored in any hospital willing to provide excellent treatment to stroke patients.

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