Association of Time of Day When Endovascular Therapy for Stroke Starts and Functional Outcome

Steven D. Hajdu, MD, Johannes Kaesmacher, MD, Patrik Michel, MD, et al.

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Study Question
Is the time when endovascular therapy (EVT) for acute ischemic stroke starts associated with mid-term functional outcomes?

What Is Known and What This Paper Adds
The risk of occupational errors and accidents becomes much higher as workers spend more time on the job, and this fact has prompted concerns about the long working hours of many neurointerventionalists. This investigation’s results found that outcomes are better when EVT starts earlier in the day.

Methods
For this retrospective cohort study, the investigators analyzed data from 1,558 adults with acute ischemic stroke (48% male; mean age, 71.1 years; interquartile range, 62.4–82.0 years) who underwent EVT at 2 university hospitals in Switzerland between 2012 and 2018. The investigators sorted these patients into 12 equally large groups defined by their EVT start time windows, with the start times ranging from 8:00 AM (i.e., the start of the work day) to 7:59 AM (i.e., just before the start of a new work day). The time windows varied in terms of total durations. The patients underwent neurologic outcome assessments, with estimation of the modified Rankin Scale (mRS) score at 90 days. The investigators also used a proportional odds model to calculate the common odds ratios as measures of the likelihood of EVT initiation during a given window to predict favorable shift durations based on the 90-day mRS scores. These window-specific common odds ratios were the primary outcomes.

Results and Study Limitations
The proportional odds model revealed that EVT start times ranging from 8:00 AM to 10:20 AM or from 10:20 AM to 11:34 AM predicted favorable shifts in the 90-day mRS scores. However, start times ranging from 3:55 PM to 5:15 PM or from 6:55 PM to 8:55 PM predicted unfavorable shifts in the 90-day mRS scores. The present study’s limitations included the inability to control for some important potential confounders, such as a treating clinician’s skills or training level and the lack of EVT standardization early in the study period.

Study Funding and Competing Interests
This study received no funding. The authors report no competing interests. Go to Neurology.org/N for full disclosures.

Table
Relationships Between EVT Start Time Windows and 90-Day mRS Score Shifts

<table>
<thead>
<tr>
<th>EVT start time window</th>
<th>OR (95% CI) for favorable shift in 90-d mRS scores</th>
</tr>
</thead>
<tbody>
<tr>
<td>8:00 AM to 10:20 AM</td>
<td>0.53 (0.38–0.75)</td>
</tr>
<tr>
<td>10:20 AM to 11:34 AM</td>
<td>0.62 (0.44–0.87)</td>
</tr>
<tr>
<td>3:55 PM to 5:15 PM</td>
<td>1.47 (1.03–2.09)</td>
</tr>
<tr>
<td>6:55 PM to 8:55 PM</td>
<td>1.49 (1.03–2.15)</td>
</tr>
</tbody>
</table>

A draft of the short-form article was written by M. Dalefield, a writer with Editage, a division of Cactus Communications. The corresponding author(s) of the full-length article and the journal editors edited and approved the final version.
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