



Letter: An International Investigation Into the COVID-19 Pandemic and Workforce Depletion in Highly Specialized Neurointerventional Units - Insights From Stroke Thrombectomy and Aneurysm Registry and Endovascular Neurosurgery Research Group.

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Letter: An International Investigation Into the COVID-19 Pandemic and Workforce Depletion in Highly Specialized Neurointerventional Units – Insights From Stroke Thrombectomy and Aneurysm Registry and Endovascular Neurosurgery Research Group

To the Editor:

The COVID-19 pandemic has imposed unprecedented challenges on health-care systems to protect providers while maintaining sufficient resources to handle emergent conditions. Endovascular thrombectomy for stroke is a time-sensitive life-saving procedure that involves highly-specialized units of neuroendovascular-trained interventionalists, nurses, and technologists. In this group, minimizing the exposure of providers to COVID-19 maintains emergency operations. We studied the impact of the COVID-19 pandemic on the functional capacity of neuroendovascular units in 35 centers globally,¹ including regions with high (>2000 cases/1 million) or low COVID-19 prevalence (<2000 cases/1 million) between 3/1/2020 and 5/10/2020. Among 592 providers, we surveyed 113 interventionalists, 251 nurses, and 228 technologists.

Elective neuroendovascular interventions were cancelled across all sites within a median of 14 d (interquartile range: 10-21) from the first case reported in the region. This delay was similar between sites of high or low COVID-19 prevalence ($P > .1$). Mitigation strategies to limit staff exposure included reducing the number of staff in physical proximity by dividing the teams into mutually exclusive groups, assuming all patients were COVID-19 positive until proven otherwise, and using COVID-19 testing as resources permit.²⁻⁴ Despite these measures, 38% of providers were required to self-quarantine due to COVID-19 exposure or confirmed or suspected infection. This percentage was similar between high and low prevalence sites (39% vs 37%, $P > .1$), but with significant variability within the same prevalence class ($\sigma = 40\%$). Due to the presence of mutually exclusive teams, high rates of self-quarantine did not force centers into diversion except for one site (<1 wk). The self-quarantine rate was higher in nurses (50%) and technologists (40%) compared to interventionalists (6%, $P < .05$). Higher relative exposure of nurses and technologists is expected given their more prolonged and more frequent physical interaction with patients. Among providers who self-quarantined, only 12% tested positive for COVID-19 using polymerase chain reaction-based testing, and were limited to high prevalence regions. A higher proportion of quarantined interventionalists tested positive for COVID-19 (28%) compared to nurses (13%) and technologists (8%) in high prevalence sites ($P < .05$). No COVID-19 infection was documented in providers in low prevalence regions during the study. We observed a strong positive correlation between the number of quarantined providers and those testing positive for COVID-19 ($R^2 = 0.56$, $P < .01$),











suggesting that quarantine efforts were implemented appropriately. In contrast, the correlation was weak between the prevalence of COVID-19 infection in the community and the number of providers positive for COVID-19 ($R^2 = 0.15$) suggests that the implemented mitigation strategies have successfully prevented the outbreak from compromising the services provided by highly specialized units.

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REFERENCES

1. Alawieh AM, Spiotta AM. The stroke thrombectomy and aneurysm registry: inception, present, and future. *World Neurosurg.* 2020;138:562-564.
2. Fiorella D, Fargen KM, Leslie-Mazwi TM, et al. Neurointervention for emergent large vessel occlusion during the COVID-19 pandemic. *J NeuroIntervent Surg.* 2020;12(6):537-539.
3. Fraser JF, Arthur AS, Chen M, et al. Society of neurointerventional surgery recommendations for the care of emergent neurointerventional patients in the setting of COVID-19. *J NeuroIntervent Surg.* 2020;12(6):539-541.
4. Leslie-Mazwi TM, Fargen KM, Levitt M, et al. Preserving access: a review of stroke thrombectomy during the COVID-19 pandemic. *AJNR Am J Neuroradiol.* 2020;41(7):1136-1141.

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