



**House Transportation and Public Safety Committee
Proponent testimony on Senate Bill 21
Mahesh Jayaraman, M.D.
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SB 21 – Regards emergency medical services and stroke patient protocols

Chairman Baldrige, Vice Chair McClain and Ranking Member Sheehy, thank you for the opportunity to provide proponent testimony on Senate Bill 21. My name is Mahesh Jayaraman, M.D., and I am a neuroradiologist who specializes in interventional neuroradiology at Rhode Island Hospital in Providence, RI. I also serve on the Board of Directors for the Society of NeuroInterventional Surgery (SNIS).

On behalf of SNIS, thank you for your consideration of SB 21. I fully support this legislation and its intent to improve emergency triage and transportation protocols for stroke patients in Ohio, particularly for those afflicted with emergent large vessel occlusion (ELVO) – the deadliest form of an ischemic stroke caused by a blot clot in the brain.

The next revolution in stroke treatment is here. Today, we can save lives and prevent long-term disability among patients afflicted with severe cases of stroke such as ELVO through a minimally-invasive procedure called mechanical thrombectomy – also referred to as endovascular therapy. Through this procedure, which is conducted by highly trained neurointerventional care teams, we can locate and extract the clot responsible for the stroke and restore blood flow to the brain. Most patients who have this procedure fully recover from their stroke and live long, productive lives.

Endovascular therapy is available across the country at designated Comprehensive (Level 1) Stroke Centers (CSC), where the procedure can be performed 24/7/365. However, my colleagues and I have found that in most states, emergency transportation protocols for stroke are not aligned with the technology available for effectively treating this illness. Most protocols simply advise EMS to transport stroke patients, regardless of severity, to the nearest hospital – which is not always the best-equipped hospital for treating severe stroke like ELVO. This is where legislation such as SB 21 will make a difference for these patients.

I was proud to be part of the effort in Rhode Island where we achieved a statewide protocol for the rapid identification and transport of patients with a potential ELVO directly to a CSC in 2015.

Attached for your review is a study I was part of where my colleagues and I measured the effectiveness of this new protocol between January 1, 2016 and December 31, 2017. Since this



protocol was adopted, we have found that triaging these patients to a slightly more distant CSC (as opposed to the closest hospital) is associated with faster time to endovascular treatment and less disability at 90 days. In our urban region, this was merely an extra seven minutes in the ambulance, which saved nearly an hour to the start of the thrombectomy procedure. Other studies have found that for every 4-minute delay in transport to treatment, one additional patient out of 100 is more disabled. Additionally, for every minute saved in transfer to the most appropriate care, there is \$1,000 savings in medical costs.

My colleagues and I also determined that those seven additional minutes of prehospital transport was associated with a 16 – 26% absolute increase in functional independence among the treated patients. Where a Comprehensive Stroke Center and a Primary Stroke Center are in close proximity, direct transport to the former (CSC) is likely to result in better patient outcomes.

When applying this to Ohio, one group determined that in the greater Cincinnati region, the median additional transport time to a CSC was just 8 minutes. Certainly there are more rural regions where the transport protocols would need to be adapted, but a larger proportion of patients live in these urban/suburban regions and stand to benefit from direct transport to a center where they can receive lifesaving therapy in a timely fashion.

I am also happy to provide a more recent study that was published earlier this year in the *Journal of NeuroInterventional Surgery*. Although this study focuses on the effects of endovascular treatment for stroke patients in the Netherlands, the results reinforce what my colleagues in the neurointerventional community and I have known to be true for years – that faster time to endovascular treatment (EVT) is cost effective and results in a gain of health, or improved quality of life for patients.

Last, but not least, I am happy to provide a copy of a recently published special report, *Recommendations for Regional Stroke Destination Plans in Rural, Suburban, and Urban Communities From the Prehospital Stroke System of Care Consensus Conference*. In collaboration with partners such as the National Association of State EMS Officials (NASEMSO) and the National Association of EMS Physicians, among other key partners, SNIS provides an in-depth overview of how treatment for stroke has evolved in recent years and recommendations EMS agencies should consider implementing within their respective regional stroke systems of care to ensure best patient outcomes. These latest recommendations echo what we have discussed previously – that in cases of suspected severe stroke, the closest hospital may not be the most appropriate, and every region should develop a triage plan that ensures patients get to the highest level hospital as is reasonable for their individual region.



As a physician who regularly treats patients suffering from stroke, I have witnessed the tragic outcomes when patients endure significant delays in transport because they were first taken to a hospital ill-equipped to treat them. They may be transferred to two or more additional facilities before ultimately reaching the one best-equipped to treat them, but by then it is too late – too many brain cells have been lost because of the stroke.

Your support for SB21 will help ensure more patients can achieve a full recovery following a severe stroke. I appreciate the opportunity to share what we accomplished in Rhode Island and hope to see Ohio follow suit. Thank you.



Mahesh Jayaraman, M.D.