

NYEE's Eye Stroke Program

Combines Expertise and Technology to Provide Rapid Diagnosis and Delivery of Care

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When a person suffers a central retinal artery occlusion (CRAO), time is of the essence. CRAO is the ocular equivalent of a cerebral stroke, and like a stroke, emergent treatment is necessary to prevent permanent retinal damage and vision loss.

Thanks to new automated optical coherence tomography (OCT) systems and an innovative new program at Mount Sinai Health System—one that brings together the expertise of ophthalmologists, neuroradiologists, and emergency department faculty—more patients with CRAO can receive timely diagnosis and treatment to save their sight.

Timely Treatment of Eye Strokes

Untreated, eye strokes cause permanent, devastating vision loss in the affected eye. To dissolve the clot, an infusion of tissue plasminogen activator (tPA) needs to be administered into the ophthalmic artery. But there is a very small window of opportunity to intervene. To prevent permanent blindness, blood flow to the retina must be restored within about 12 hours—and ideally within six hours or less. Researchers at New York Eye and Ear Infirmary of Mount Sinai (NYEE) have found that, when used within



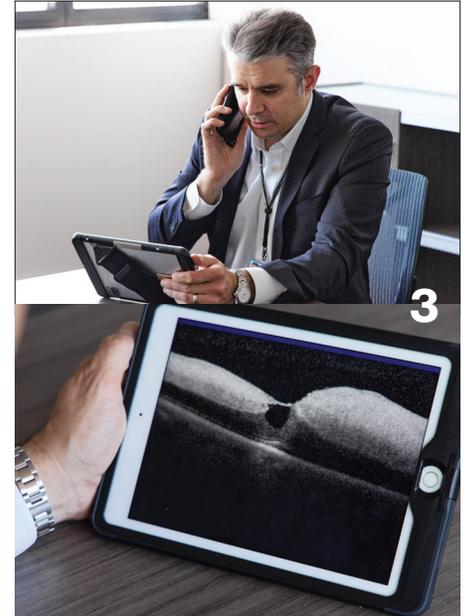
Patient being examined in the Emergency Department at The Mount Sinai Hospital by a Mount Sinai Stroke Service resident.



Resident administering an OCT scan for suspected central retinal artery occlusion (CRAO).

12 hours, intervention with tPA is safe and leads to significant visual improvement (*Published in Clinical Ophthalmology, 2021**).

Unfortunately, several factors can delay treatment. Patients who experience a sudden loss of sight in one eye often wait several hours before coming to the emergency department, hoping the problem will resolve on its own. Physicians, and even some ophthalmologists and optometrists, may not know that effective treatment is available.



A Retina attending on call responding to an alert from the ED regarding a possible CRAO and reviewing ocular images from the OCT scan.

Once in the emergency department, diagnosis may be delayed by the availability of on-call house staff, referrals to ophthalmology, or by the availability of a skilled provider who can perform emergent fluorescein angiography, traditionally used to diagnose CRAO.

OCT is a shortcut to an accurate diagnosis. The system uses infrared light to produce cross-sectional images of the retina at the resolution of just a few microns. This technology has fundamentally changed the way we practice ophthalmology. Yet early OCT systems were not especially accessible. With newer robotic OCT systems, however, the technology

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can be used more widely—even by providers without specialized ophthalmologic or imaging training.

With funding from The New York Eye and Ear Infirmary Research Foundation, the Department of Ophthalmology was able to purchase automated OCT systems for three of the largest emergency departments within Mount Sinai (The Mount Sinai Hospital, Mount Sinai West, and Mount Sinai Queens). Each site has a stroke service and capacity for endovascular tPA injection.

We are now training frontline members of the stroke service to use OCT to assess patients with suspected CRAO. The technology is a one-button test that neurology personnel can learn in a single 15- or 20-minute training session. Once the images are collected, physicians can upload them to share with off-site specialists for immediate consultation, dramatically speeding up the diagnosis of CRAO.

Improving Emergency Eye Care
CRAO is less common than some

other causes of sudden vision loss, such as new-onset wet macular degeneration, diabetic retinopathy, or other inflammatory situations. However, occlusions are the most time-sensitive cause of sudden vision loss. By investing in OCT technology and collaborating with stroke and emergency personnel, we hope to improve response times for patients with this condition.

In addition to investing in technology, the NYEE team is also working on improving communication between emergency department providers, the ophthalmology faculty, and the stroke team to expedite the diagnosis and treatment of CRAO. Working together to treat patients promptly, we can help them regain a substantial amount of vision in the affected eye.

NYEE was founded 200 years ago as the first eye and ear specialty hospitals in the United States. For two centuries, we have continued to provide cutting-edge care to preserve patients' sight. Investment in the latest technologies and

training is an important piece of that mission. We are fortunate to have a large concentration of ophthalmic expertise within NYEE, and we are committed to extending that expertise to provide the highest quality multidisciplinary care to patients locally, regionally, nationally, and internationally.



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*Sobol EK, Sakai Y, Wheelwright D, et al. Intra-Arterial Tissue Plasminogen Activator for Central Retinal Artery Occlusion. *Clin Ophthalmol.* 2021;15:601-608. Published 2021 Feb 16. doi:10.2147/OPTH.S272126



#12 in the Nation
(highest in NYC) in Ophthalmology
by U.S. News and World Report "Best Hospitals" rankings.

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