

STROKE OF GENIUS: THE FIRST THROMBECTOMIES PERFORMED AT MOUNT SINAI QUEENS

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BACKGROUND

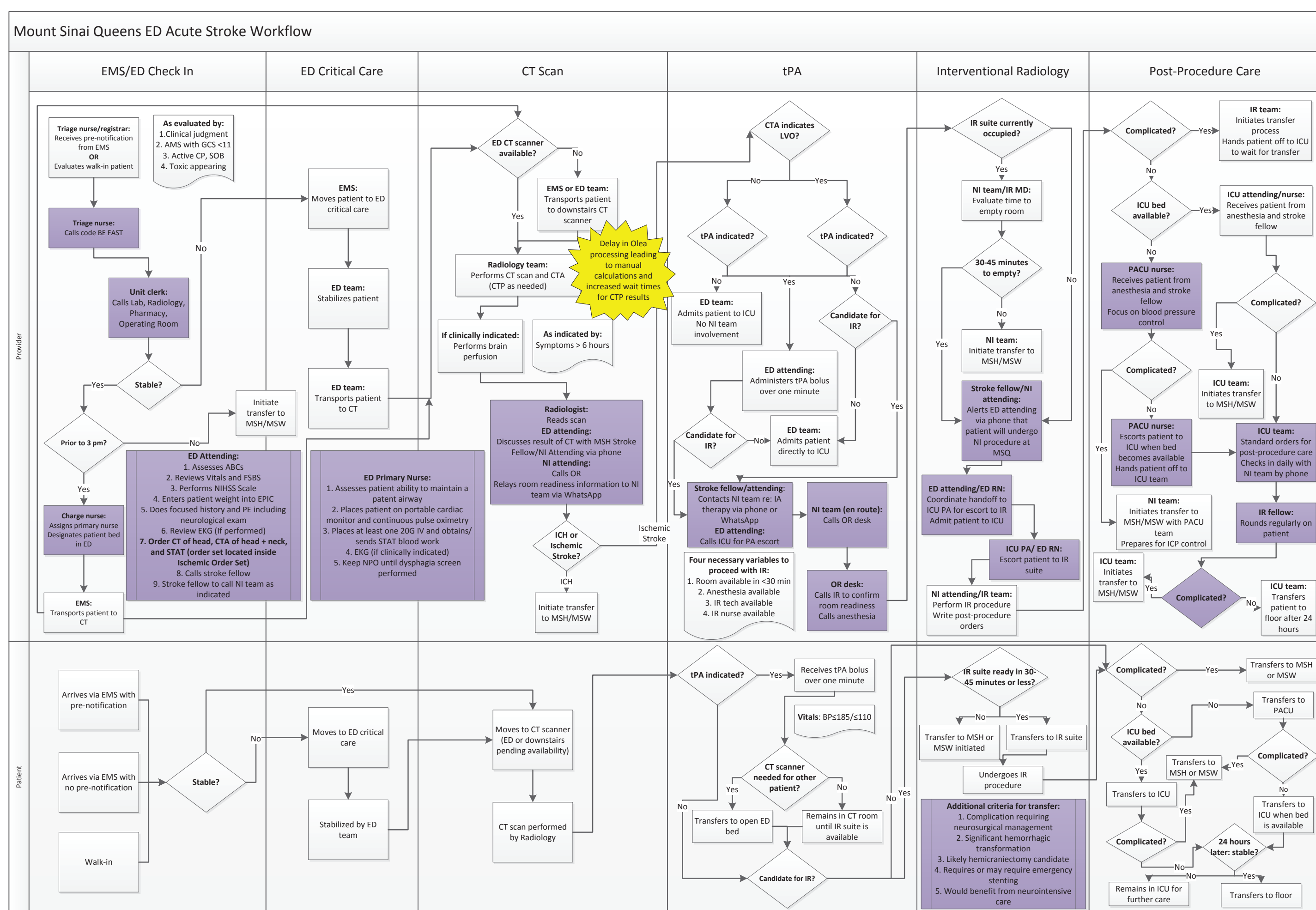
Due to the rapidly aging population in the borough of Queens in New York City, there is an anticipated increase in the community prevalence of stroke. In order to accommodate the influx of stroke patients and to adhere to best clinical practices, Mount Sinai Hospital of Queens is developing a state-of-the-art stroke center to open in early 2019 that will perform thrombectomies 24/7 on EMS-transferred patients as early as possible. While our stroke center is under construction, we initiated the capability to perform thrombectomies in our existing onsite interventional radiology suite for eight hours a day, Monday through Friday, to establish familiarity with the procedure and prepare for the opening of the stroke center next year.

AIM

To prepare for a new clinical procedure that was unfamiliar to existing emergency and ancillary staff going live in September of 2017, we utilized multiple Model for Improvement best practices to anticipate process vulnerabilities and standardize workflows. Throughout this process, we aimed to develop team cohesion.

PROCESS IMPROVEMENT TECHNIQUES IMPLEMENTED

We spent many sessions working through a **process map** of how a patient might get from the door of the emergency room to the table in the IR suite for a thrombectomy, as well as how an inpatient with a large vessel occlusion would be treated if thrombectomy was indicated. We held a **failure mode and effects analysis (FMEA) session** with an interdisciplinary team prior to the go-live of thrombectomies in our existing suite. We scheduled dry runs, walkthroughs, and even a mock stroke patient drill to engage the team in **simulations**.



STEPS IMPLEMENTED

We scheduled multiple process mapping sessions with key stakeholders beginning four months prior to our go-live date to account for different possible scenarios of patients needing thrombectomy, including those arriving via EMS, or those needing to be transported from the floor. One month prior to our go-live date, we staged a dry run of the process, which started at the ambulance ramp in the ED and concluded in the ICU. All personnel, including ED, radiology, pharmacy, anesthesia, and critical care, were present. Around this time, we distributed a survey to the stroke care team asking them to reflect on their top concerns for the process. We repeated this survey with the same population both immediately before and after the FMEA session. One week prior to our go-live date, we held the FMEA session over the course of a few hours to identify any vulnerabilities that had been discovered during the walkthrough or prior, and ranked them according to their risk priorities. Three days prior to our go-live date, we hired a mock patient to test our process from start to finish. A little over 45 days in, we performed our first thrombectomy onsite.

MAY 2017
• Process mapping began

SEPTEMBER 6th, 2017
• FMEA session
• Repeat of survey about team members' top concerns

SEPTEMBER 13th, 2017
• Go-live

AUGUST 18th, 2017
• Dry run from ambulance bay to ICU
• Survey about team members' top concerns

SEPTEMBER 8th, 2017
• Mock patients

OCTOBER 20th, 2017
• First thrombectomy performed at MSQ

CHALLENGES FACED

As a community hospital that is part of a larger health system, we utilize a floating team that covers thrombectomy cases at four Mount Sinai Health System hospitals. As a result we are limited by not only their availability, but also the availability of our own IR suite, the initial restricted thrombectomy schedule, and anesthesia support. We faced a unique challenge in introducing a well-established neuro-interventionalist team who work at multiple academic institutions within our system to our community hospital facility. Facilitating the communication process between the offsite team and their onsite ancillary support was key in setting the groundwork for success. We additionally needed to ensure the comfort level of the staff in caring for a class of patients that they had not dealt with previously. To increase familiarity and comfort, we held dry runs and walkthroughs with all involved staff as well as a mock stroke patient drill immediately prior to our go-live date.

TEAM

The multidisciplinary team included emergency department physicians, nurses, and registrars; radiology techs; anesthesiology physicians; interventional radiology techs and nurses; post-anesthesia care nurses; critical care physicians and nurses; neuro-interventionalist physicians and fellows; stroke neurology physicians; and neuro-critical care physicians.

SUSTAINABILITY

Since September 2017, we have performed eight thrombectomies onsite at Mount Sinai Queens with generally good outcomes. Immediately following the first case and a few others, we held **debrief sessions** with all of the practitioners who were involved so that they could share what had worked well and whether there was anything that should be revisited from a process perspective. We created a **self-evaluation tool** for the ED personnel to measure their adherence to the outlined process and to note the timing, so that we could track improvements in door-to-needle time for tPA. There are 30 instances of patients who would have been candidates for thrombectomies who had to be transferred to other Mount Sinai facilities due to our current limited hours or lack of IR suite availability. We hope that the opening of our new 24/7 suite will be able to accommodate such patients in the future. We plan to repeat both our process mapping session and our FMEA session prior to the opening of the new suite and we look forward to an increased case volume and continued positive outcomes.

LESSONS LEARNED

This was an important opportunity for us to utilize process mapping and FMEA sessions at Mount Sinai Queens. Not only was it a critical junction in stroke care at our facility, it was also the beginning of a new era for us in using process improvement methodology in a variety of areas across the hospital. We believe that testing process vulnerabilities prior to ever having a stroke patient pass through our facility was crucial to our successes thus far, both in terms of patient outcomes and in terms of teamwork. The multiple sessions we held throughout the months leading up to our go-live date provided opportunities for team building and bonding as well as expansion of knowledge into a clinical area not often seen onsite previously.

We learned to take extra care during the activation of the IR suite on patient arrival, because simultaneous availability of anesthesia, an IR tech, and an IR nurse is necessary to proceed. For this reason we have both the ED unit clerk and the neuro-interventionalist call to confirm that the suite will be ready and that all personnel are available. Additionally, we knew to put extra effort into PACU nurse education, since this is a patient population with whom they were previously unfamiliar. Communication and handoffs between the ED, the anesthesia team, the PACU, and the ICU are vital for this program and our patient outcomes. It is our responsibility as administrators to establish an infrastructure that facilitates the easiest possible workflow for physicians and staff so that they can perform their jobs to the best of their abilities. Lastly, as a community hospital, we are proud of the fact that we have been able to bring a state of the art treatment that greatly increases quality of life to the local Queens population.

