

Site Name: Queen's Medical Centre (Nottingham University Hospitals NHS Trust)

The TASC Principle: Using measurement and structured quality improvement methodology to understand and reduce variation in the acute stroke pathway, strengthen multidisciplinary working, increase thrombolysis rates and reduce delays in diagnosis and treatment.

The Challenge

Stroke is a leading cause of disability and death, and quick thrombolysis is critical to improving patient outcomes. At Nottingham University Hospitals, thrombolysis rates were below national ambition, and delays were evident across the acute pathway.

At first glance, the pathway appeared straightforward. However, when the team examined it in detail, it became clear that it was a complex, multi-step process involving multiple teams, systems and competing priorities.

Detailed process mapping and pathway review revealed a number of previously unseen issues. Delays occurred at multiple points, including blood tests, access to CT scanning, and clinical decision-making. These were driven by a combination of operational factors such as staffing gaps, communication challenges, and system pressures.

As a major trauma centre, Queen's Medical Centre also faced significant competing demands, particularly around access to CT. Stroke patients were sometimes deprioritised compared to trauma cases, creating unavoidable tension within the system.

There were also challenges in cross-team alignment. Teams outside of stroke did not always perceive stroke as a time-critical emergency, leading to variation in urgency and response.

Importantly, many of these issues had not previously been fully understood. Staff reflected that they had not appreciated the complexity of the pathway or the extent to which delays were distributed across different parts of the system.

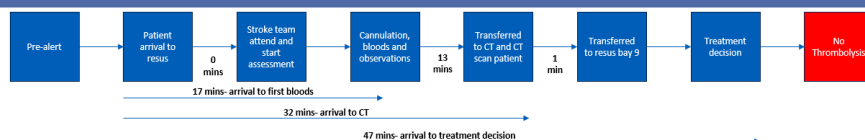
Variation in clinical decision-making also contributed to lower thrombolysis rates, particularly for patients with low NIHSS scores, where a more cautious approach often led to missed treatment opportunities.

What they did (the process)

The Nottingham team adopted a structured quality improvement approach through the TASC programme, centred around a clear aim of achieving a door-to-needle time of 30 minutes or less for every appropriate stroke patient entering the FAST pathway.

The first step was to build a deep understanding of the pathway. Process mapping and patient-level pathway reviews were used to break the pathway down into its component parts, making delays visible and enabling the team to identify where change was needed (Figure 1).

Patient pathway review- Patient 1: 30/01/2025



Process challenges identified

- 10-minute delay in CT scan due to major trauma prioritisation
- No junior doctor available on arrival (on lunch with no cover)
- Delay in thrombolysis due to triaging process
- Junior doctor not picking up baton phone
- Patients sometimes not on the system when the process starts
- CT protocol pushback causes additional delays
- 17-minute delay for bloods and cannulae
- Too task-oriented approach affecting overall efficiency
- Large number of tasks for attending team, including BP checks for aortic dissections
- ANP responsible for multiple tasks: cannulation, bloods, NIHSS, obs, data, swallow assessments
- Junior doctor role includes cannulation and bloods—steep learning curve for newly rotated
- Differences in consultant availability (phone vs. in-person) impact workflow
- FAST team could be faster—idea to refine inclusion criteria
- Mimic cases create distractions during thrombolysis
- Challenges with virtual ward—patients who are not stroke cases cannot be sent back to ED
- Bargaining with CT regarding prioritisation of trauma vs. thrombolysis cases
- Ideas: improve data quality and input for HASU patients—potentially a night shift task
- Sometimes unable to access triage system, limiting decision-making
- CT staff disturbed by triage conversations
- Data breach related to Vis AI system
- No pre-alert delay but challenges in communication
- ERMA scans vetted inconsistently depending on consultant involvement
- Wording of scan requests affects approval and process speed
- Multiple triages from GPs, EMAs, and ED
- Triage in different areas lacks full information for decision-making
- Starting the stroke process before booking the patient in—can't record
- Difficulties accessing patients during critical assessment
- ED good at recognising stroke symptoms but calls for anything suspicious—high mimics

Figure 1: An example of a patient-level pathway review

A key shift was moving from focusing on individual issues to understanding the pathway as a whole system. This included recognising the role of emergency department staff, radiology, ambulance services and others, and the need to involve them fully in improvement work.

The team used a driver diagram to identify key drivers and potential change ideas that would help them achieve their aim (*Figure 2*). Key areas of focus were:

- improving front door processes
- increasing speed and access to imaging
- strengthening decision-making
- developing a 'thrombolysis mindset'

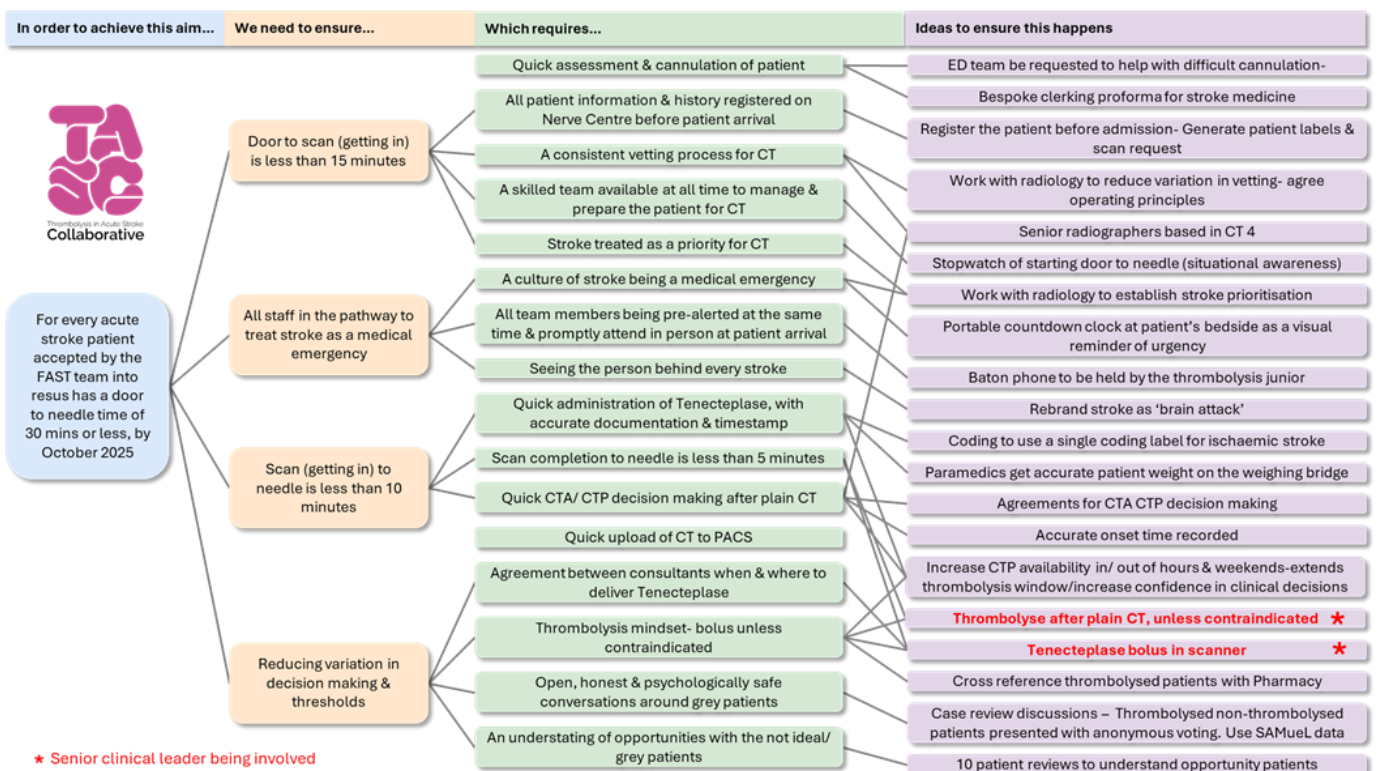


Figure 2: Driver diagram, showing the teams change ideas that they think will influence the primary and secondary drivers to help them achieve their aim

Measurement played a central role. The introduction of simplified, more accessible data enabled the team to better understand performance and system processes, using data to guide decisions and prioritise improvement work.

Using Plan-Do-Study-Act (PDSA) cycles, the team tested and implemented a series of changes, including:

- strengthening pre-alert processes and preparing for patients before arrival
- introducing pre-hospital video triage
- implementing CT perfusion scanning for faster diagnosis
- introducing an Everbridge alert system to ensure all staff are notified simultaneously
- embedding regular case review meetings to support consistent clinical decision-making
- expanding the use of AI tools such as Viz AI to improve communication and coordination
- supporting the development of a 24/7 mechanical thrombectomy service

Alongside process improvements, there was a strong focus on culture. The team worked to shift thinking from *'why should we thrombolyse?'* to *'why would we not thrombolyse?'*, encouraging more proactive and confident decision-making.

There was also a clear emphasis on stakeholder engagement. Regular meetings and communication helped bring teams together, build shared understanding, and create joint ownership of the pathway.

What they achieved (the outcomes/data)

The programme led to significant improvements in understanding, coordination and delivery of stroke care. The team gained a much clearer picture of how their pathway functioned, identifying previously unseen delays and enabling more targeted improvement.

Communication across teams improved markedly, supported by digital tools and new processes. The introduction of systems such as Viz AI, pre-hospital video triage, and the Everbridge alert system are working to transform communication by creating real-time channels between teams, improving both clinical decision-making and operational flow. This is also enabling earlier preparation before patient arrival, which is reducing delays at the front door and enabling faster progression through the pathway.

There was also a noticeable shift in culture. Staff reported increased confidence in decision-making and a growing willingness to challenge traditional approaches, particularly in relation to thrombolysis eligibility. The use of simplified data supported better decision-making and improved engagement across the team. Staff at all levels were better able to understand performance and see their role in improvement. This led to a 1.8% increase in thrombolysis rate, from 13.0% at the start to 14.8% at the end of the TASC programme (Figure 3).

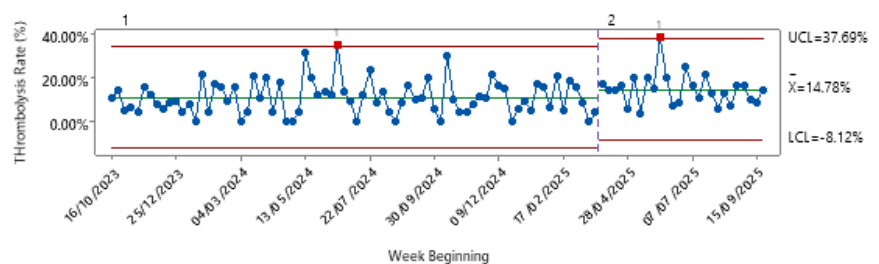


Figure 3: SPC chart showing step change improvement in thrombolysis rate.

Collaboration across departments strengthened, with improved communication, shared goals and greater alignment across the system. This was particularly strong with radiology, where collaborative working enabled the introduction and increased usage of CT Perfusion (CTP) from less than 1 a week to approx. 7 per week. CTP provides rich information in acute ischemic stroke to help clinicians decide who will benefit from reperfusion therapies, especially when the time of onset is unclear or outside the standard time window (Figure 4).

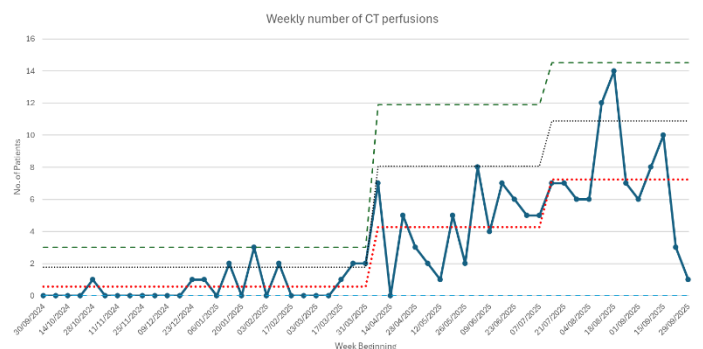


Figure 4: SPC chart showing step change improvement in the usage of CTP imaging.

Importantly, this improvement work extended beyond thrombolysis. The approach and learning from TASC supported the development of a 24/7 mechanical thrombectomy service, which went live in Septe, demonstrating wider system impact.

Although challenges remain, including workforce pressures, capacity constraints and digital limitations, the team has established strong foundations for ongoing improvement, with a clear focus on sustaining and building on progress achieved.



Testimonials

“Working with the TASC collaboration has been great. It has brought together a quality improvement programme using real-time data, and it helps us think more actively about delivering faster thrombolysis treatment for our patients.”

Dr Kailash Krishnan
Consultant Stroke Physician and Head of Service
Nottingham University Hospitals NHS Trust

“We thought the pathway was simple, but once we broke it down, we realised how many teams are involved and where the delays really were. It has made us realise we can’t make decisions on our own as a stroke team. We need to involve everyone in the pathway. The TASC programme has enabled us to do this”

Amanda Davies
Stroke and Neurology Service General Manager
Nottingham University Hospitals NHS Trust

“The improvements we’ve made, even the small wins, have kept the team engaged because people can see things happening.”

Fay O’Callaghan
Stroke Matron
Nottingham University Hospitals NHS Trust

Key system contacts

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