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CASE STUDY · MARLUC SYNOPSIS

AI imaging decision support in NHS stroke care (Brainomix 360 Stroke)

IMPLEMENTED 2020–2024 · HEALTH AND LIFE SCIENCES · UK · BAND C · PARTLY PROVED

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AI software that reads acute stroke scans was in use at 26 English hospitals by early 2022 and, per NHS England, at all stroke centres by summer 2024. A prospective observational study of 107 hospitals found thrombectomy rates doubled at those 26 hospitals, a larger rise than elsewhere, with faster transfers. The design shows association; NICE allows use only with clinician review while evidence is gathered.

ABOUT THIS SYNOPSIS

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NOTICE WORDING LAST UPDATED 16 NOVEMBER 2026

AT A GLANCE

Frontier case: AI used for a scientific, medical or engineering breakthrough. MarLuc grades what has changed in practice so far.

AI used: AI analysis of acute stroke CT scans: Brainomix's stroke imaging software (called e-Stroke in NICE guidance and Brainomix 360 Stroke in the 2025 study) detects signs of ischaemic stroke, locates large vessel occlusions and analyses perfusion scans within minutes, alongside clinician review.

Implemented: 2020–2024. Grade: band C, Process change, Partly proved.

Headline result, as reported: Thrombectomy rates doubled from 2.3% to 4.6% at 26 English hospitals after AI stroke imaging software was introduced, against a rise from 1.6% to 2.6% elsewhere, in a prospective observational study of 452,952 stroke patients

1 · The case

The facts, as reported by the 6 sources listed at the end. Where a source is silent, the field says "Not reported".

Organisation

NHS England stroke services, with Brainomix. The NHS in England, where 107 hospitals admit patients with acute stroke and around 80,000 strokes occur each year, per NHS England. Many patients arrive first at primary stroke centres that do not perform thrombectomy and must be transferred to a comprehensive stroke centre. Canvas block: 4. Operations and process. Also 5. People and skills, 6. Technology and data.

Business challenge

The challenge. Thrombectomy, which removes a clot in a major stroke, is highly time-sensitive: per NHS England, every 20-minute delay cuts the chance of full recovery by around 1%. Rapid scan reading is hardest in hospitals without on-site neuroradiology expertise, and transfers between hospitals add delay.

How it was addressed. The government committed in June 2023 to AI decision support in all stroke networks by the end of 2023, up from 86%. Brainomix 360 Stroke was introduced systematically at 26 hospitals in four regional thrombectomy networks, all deployed by January 2022, with optimised images sent automatically to the AI server alongside the standard images. NICE asks centres to make sure images shared between stroke centres can be reviewed remotely. NHS England says AI decision-support tools reached all stroke centres in England in summer 2024 as part of the national optimal stroke imaging pathway, with Brainomix rolled out to over 70 hospitals. [1] [2] [3] [4] [5] [6]

Who implemented it

Brainomix (Software vendor): Supplied the Brainomix 360 Stroke imaging software; four of its staff co-authored the evaluation..
University of Oxford (University or research lab): Authors from the Radcliffe Department of Medicine and the Centre for Statistics in Medicine took part in the evaluation..
In-house (In-house): Funded the evaluation through an AI in Health and Care Award and led the national rollout..
Health Innovation Oxford and Thames Valley and clinicians from NHS trusts across England also co-authored the evaluation. The four regional thrombectomy networks in the evaluation are not named in the sources opened.

Technology (SEAM pillar E)

SEAM types: T8 Predictive / ML models. Deployment: Not reported. Vendors and products: Brainomix, Brainomix 360 Stroke (e-Stroke: e-ASPECTS, e-CTA, e-CTP).

Where it was built in: Built into the acute stroke imaging pathway: non-contrast CT and CT angiography, and CT perfusion where used locally, are sent automatically to the AI server alongside standard images, and results support decisions and transfers between primary and comprehensive stroke centres.

What changed

Before: scans were interpreted without AI support, and many hospitals had no on-site neuroradiology expertise, per NHS England. After: AI analysis is available within minutes in every regularly admitting stroke service in England, per NHS England, and supports decisions to

What it cost

Licence about £30,000 a year for a comprehensive stroke centre and about £15,000 a year for an acute stroke centre, per NICE. Total national cost: Not reported. The £21 million AI Diagnostic Fund announced in June 2023 covered AI tools in general; the stroke share is not reported.

What it saved

Thrombectomy at evaluation sites rose from 2.3% to 4.6%, against 1.6% to 2.6% at other sites. Patients reviewed with AI were more likely to have thrombectomy (5.9% against 3.4%; odds ratio 1.57) and thrombolysis (17.7% against 9.0%). Median door-in door-out time for transferred patients was 128 minutes with AI against 192 without. Good functional outcome at discharge 47.1% against 45.6%; in-hospital mortality 10.5% in both groups. Cost saving: Not reported; NICE's economic model found a small increase in thrombectomies would likely make the software cost effective. [1] [2] [3] [4] [5] [6]

Governance and control

NICE permits use only with clinician review and existing reporting protocols, and requires further evidence. Use is recorded per patient in the national stroke audit. The evaluation was funded by NHS England and co-authored by Brainomix staff and NHS England's National Clinical Director for Stroke.

S2 · Accountable owner · Claimed
NHS England describes a national programme that introduced AI decision support in every regularly admitting stroke service; its National Clinical Director for Stroke co-authored the evaluation. [2]

A1 · Safe use · Outside scrutiny (a regulator, court, auditor or similar body acted)
NICE allows e-Stroke only with Digital Technology Assessment Criteria approval and asks centres to keep existing scan reporting protocols to reduce the risk of incorrect results. [3]

A2 · Human in the loop · Outside scrutiny (a regulator, court, auditor or similar body acted)
NICE says the software should only be used with healthcare professional review and that professionals should be cautious about changing their findings based on its results. [3]

A3 · Monitoring and assurance · Evidenced
Use and outcomes are tracked through the national stroke audit, which has recorded AI use per patient since July 2021, and were evaluated in a peer-reviewed national study. [1] [6]

A4 · Vendor AI · Evidenced
NICE names the vendor, licence prices and the company's stated CE class (IIa); the evaluation names the product and lists four authors affiliated with Brainomix. [1] [5]

A5 · Agent controls · Not reported
No agents described.

A6 · Standards and regulation · Outside scrutiny (a regulator, court, auditor or similar body acted)
NICE diagnostics guidance (January 2024) permits use in the NHS during evidence generation and sets the evidence it needs on access to treatment, time to treatment and scan failures. [3]

What worked, what did not, what is unproven

WORKED

– Thrombectomy rates doubled at evaluation sites (2.3% to 4.6%), a larger rise than at other sites (1.6% to 2.6%).

– At patient level, AI use was associated with higher odds of thrombectomy (odds ratio 1.57, 95% CI 1.33 to 1.86).

– Gains were largest in primary stroke centres without on-site neuroradiology, per NHS England and the study's exploratory analyses.

DID NOT

– In-hospital mortality did not change (10.5% in both groups), and the gain in good functional outcome at discharge was modest (47.1% against 45.6%).

– Thrombectomy rates also rose by 62.5% at non-evaluation hospitals, which increasingly adopted AI independently, while eligibility criteria and time windows widened during the study.

– NICE found no evidence meeting its review criteria on the software's accuracy when used alongside healthcare professional review.

UNPROVEN

– How much of the rise is caused by the software: the study is observational and NICE said it is unclear to what extent faster or greater access is an effect of the software.

– Long-term disability and survival: outcomes were measured at discharge.

– How often the software fails to analyse scans, which NICE lists as an evidence gap.

Timeline

Jan 2019 Study baseline begins: national stroke audit data from all 107 stroke-admitting hospitals in England [1]

Jul 2021 National stroke audit adds a field recording whether AI support was used for each patient [6]

Jun 2023 Government commits to AI decision support in all stroke networks by the end of 2023, up from 86% [4]

Jan 2024 NICE says e-Stroke, RapidAI and Viz can be used in the NHS while more evidence is generated, with clinician review [3]

2024 AI decision-support tools rolled out to all stroke centres in England in summer 2024, per NHS England [2]

Dec 2025 The Lancet Digital Health publishes the national evaluation: thrombectomy rates doubled at evaluation sites [1]

2 · Grade and SEAM assessment

MarLuc's opinion, made on the evidence above. How cases are graded: marluc.co.uk/case-studies/how-we-rate

Level of change and impact

Claimed: Not applicable. Grade: C, Process change. Proof: Partly proved. Level of change: Process change.

Process change (Level 2, band C). AI support is now part of the national stroke imaging pathway, with clinicians making every decision; the treatment gain is an association in an observational study.

A process change across a national clinical pathway: stroke scans in every regularly admitting

The SEAM view and lessons learnt

The national result came from a package: AI scan reading, image sharing between hospitals, a funded national rollout and a stroke audit that records AI use per patient. The study shows a larger rise in thrombectomy where AI was used, but other hospitals improved too as treatment criteria widened, so the AI's own share cannot be fully separated. Before copying the approach, a leadership team should ask how it will measure the outcome it cares about at patient level, and how clinicians will keep checking AI output for themselves.

1. Record AI use per case in your existing performance data from day one.
2. Pair the AI tool with the pathway change it is meant to speed up.
3. Keep clinician review and existing reporting protocols in place.

Evidence

Score 3 of 4. Independent with vendor involvement: peer-reviewed prospective observational study (The Lancet Digital Health, 2025) on national audit data, funded by NHS England, with four Brainomix-affiliated authors; NICE diagnostics guidance (2024). Limits: observational design, outcomes at discharge only.

Evaluation method. Prospective observational study: hospital-level before-and-after comparison of 26 evaluation hospitals against 81 other hospitals, plus patient-level comparison of patients reviewed with and without AI, using the Sentinel Stroke National Audit Programme.

Sources disagree. NHS England says around 15,000 patients directly benefitted from having scans reviewed by the tool; the study reports that 15,377 patients were reviewed with AI and an association between AI use and more thrombectomy; causation is not shown. The government aimed for all stroke networks by the end of 2023; NHS England reports all stroke centres were covered in summer 2024.

Status. Ongoing: in routine use across English stroke services, per NHS England (December 2025). NICE guidance allowing use during evidence generation was last updated in May 2024.

3 · Original sources

Read these in full. To challenge a fact or a grade, use the contact form at marluc.co.uk or the link on https://marluc.co.uk/case-studies/nhs-brainomix-stroke-ai-imaging

[1] The Lancet Digital Health (2025) via Europe PMC: Artificial intelligence imaging decision support for acute stroke treatment in England: a prospective observational study
https://www.ebi.ac.uk/europepmc/webservices/rest/search?query=EXT_ID:41339157&format=json&resultType=core

[2] NHS England: 'Life-changing' AI support helping stroke patients get a second chance (December 2025)
https://www.england.nhs.uk/2025/12/life-changing-ai-support-helping-stroke-patients-get-a-second-chance/

[3] NICE HTG708 (formerly DG57): AI-derived software to help clinical decision making in stroke, recommendations
https://www.nice.org.uk/guidance/htg708/chapter/1-Recommendations

[4] GOV.UK: £21 million to roll out artificial intelligence across the NHS (June 2023)
https://www.gov.uk/government/news/21-million-to-roll-out-artificial-intelligence-across-the-nhs

[5] NICE HTG708: Information about the technologies
https://www.nice.org.uk/guidance/htg708/chapter/2-Information-about-the-technologies

[6] HealthManagement.org: AI boosts stroke thrombectomy access (January 2026)
https://healthmanagement.org/c/it/news/ai-boosts-stroke-thrombectomy-access

NHS England stroke services, with Brainomix website: https://www.england.nhs.uk

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