National Thrombectomy Service

Annual Report 2022

OVERVIEW

I am delighted to be able to present the 2022 National Thrombectomy Service (NTS) annual report. This report is the result of a great deal of hard work from all the stroke teams across the country as well as the clinical and admin teams at the two thrombectomy centers in Beaumont and CUH. The NTS performs continuous data collection and service audit for quality improvement (registered with Beaumont Hospital Clinical Audit Department, CA210). The annual report is generated from this data. The publication of the 2022 report has been somewhat delayed due to a combination of a significantly increased workload at the two thrombectomy centers which has coincided with a temporary reduction in consultant staffing numbers at Beaumont.

Endovascular thrombectomy (EVT) is the gold standard treatment for patients with large vessel occlusion (LVO) stroke up to 24 hrs following onset of symptoms. It is estimated that up to 15% of all ischaemic strokes are eligible for EVT and it is the aim of the NTS to provide this life saving and changing treatment to as many of this patient cohort as possible. With a number needed to treat of between 2 and 3, EVT is one of the most efficacious treatments in all of medicine and has the potential to make considerable medium and long-term savings for the health service by reducing patient dependence and disability.

In 2022, 565 patients were transferred for emergency thrombectomy (392 to Beaumont Hospital and 173 to CUH). 484 of these patients underwent thrombectomy (338 Beaumont Hospital, 146 CUH). Given that in 2022 there were 5150 ischemic stroke discharges from Irish public hospitals, the national thrombectomy rate was 9.4%. This is a significant increase from 2021 when the rate was 8.5%, however there is much work still to do as we strive towards that “magic” 15%.

In 2022, 565 patients were transferred for emergency thrombectomy, Beaumont Hospital (392) and CUH (173). 9.4% of patients discharged with diagnosis of ischaemic stroke underwent thrombectomy

That “magic” 15% may in fact now be an underestimation as 2022 saw the publication of several randomized control trials (RCTs) demonstrating the efficacy of EVT in patients with large core infarcts. These “low ASPECTs” trials have the potential to further increase EVT numbers by up to 20% with the sicker patient cohort requiring increased high dependency/ICU care in the two EVT centers. We did not see this patient cohort filter through in 2022, however EVT for these patients will soon also become gold standard and this will have a significant impact in terms of resource requirements at Beaumont and CUH.

RCTs finally demonstrating the efficacy of EVT for basilar artery occlusions were also released in 2022 whilst medium vessel occlusion (MEVO) trials are currently underway assessing smaller and more distal occlusions. I have no doubt that these trials will also yield positive results further increasing the indications for EVT and consequently the number of cases being performed in Beaumont and CUH.

As well as the absolute numbers of patients’ undergoing EVT, the speed of reperfusion is hugely important with up to 4 million neurons being lost per minute following symptom onset. A fast

reperfusion time depends upon many steps, including out of hospital recognition of symptoms, ambulance transfer to and from the local stroke center, door to CT time and door in door out time (DIDO) (for patients not presenting to Beaumont or CUH). This is all before the patients arrives in the neuro-angiography suite for the EVT itself. A short summary of EVT time metrics for 2022 vs 2021 is provided in Table 1 below and it is encouraging to see an improvement in almost all metrics year on year.

In patients who underwent thrombectomy in Ireland (BH and CUH) the median times for key steps are outlined below comparing 2022 & 2021.

Table 1: Symptom onset & door time metrics:

	2022	2021
Onset ** to arrival at PSC:	1hr 39mins (n215)	2hrs (n213)
Door* to CT time:	21mins (n382)	23 minutes (n362)
Door* to needle time (DTN)	43mins (n133)	43 minutes (n132)
Door* to EVT center contact time:	BH 49mins (n218) CUH 1hr 10mins (n53)	BH 55mins (n239) CUH 56mins (n26)
Door in Door out*(DIDO):	BH 1hr 30 mins (n219) CUH 2hrs 05mins (n22)	BH 1hr 40 mins (n241)
Onset**to groin puncture:	4hrs 10mins (n285)	4hrs 16mins (n222)
Onset*** to groin puncture:	7hrs 49mins (n169)	9hrs 30mins (n202)
Onset** to reperfusion time:	4hrs 40mins (n267)	4hrs 45mins (n222)
Onset*** to reperfusion time:	8hrs 17mins (n168)	10hrs 6mins (n197)

* Excludes inpatients at time of stroke.
**Witness onset only
***Unknown onset time (last seen well & wake up group).

A lot done, more to do as the saying goes. With over 9% of ischemic strokes in Ireland now undergoing EVT, the NTS at Beaumont and CUH, as well as all referring stroke centers, have much to be proud of. However, we must continue to strive towards providing EVT to all eligible ischemic stroke patients and continue to push the boundaries in this young field of medicine. Doing this will require increased resource allocation to the two EVT centers and likely considerable reconfiguration of referral pathways, however any investment is sure to pay off in the medium and long term.

Dr. Matthew Crockett
Director National Thrombectomy service

Annual Report 2022 Overview

Emergency endovascular thrombectomy (EVT) is considered standard of care for up to 24hrs following the onset of acute ischaemic stroke. In Ireland, this procedure is carried out in two thrombectomy centers, Beaumont Hospital and Cork University Hospital. In 2022, of the 5150 patients discharged with acute ischaemic stroke, 484 patients underwent thrombectomy (9.4%)

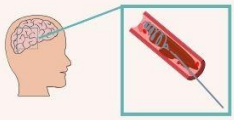
Time matters

*"**Time is Brain**" every minute saved from onset of symptoms to treatment restores one week of healthy life (Meretoja et al, 2017)*

*"**Every second counts**" from hospital arrival to EVT start, every 1 second of delay was associated with the loss of 2.2 hours of healthy life (Almekhlafi et al, 2021)*

Thrombectomy - Standard of Care

Emergency endovascular thrombectomy is a procedure performed by interventional neuroradiologists for treating acute ischaemic stroke. It involves mechanically removing the obstructing blood clot from arteries within the brain, restoring blood flow and minimising permanent tissue damage *(NICE, 2018)*
Thrombectomy is standard of care for patients with acute large vessel occlusion stroke as per multiple international guidelines. Studies show that only 26% of patients would recover without thrombectomy versus 46% with *(HERMES Collaboration, 2016)*



484 Thrombectomies

In 2022, 484 patients underwent emergency thrombectomy, 338 at Beaumont Hospital and 146 at Cork University Hospital.

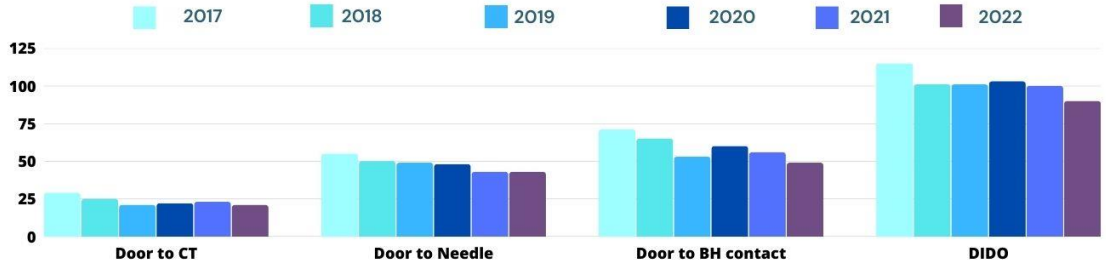
Onset to Reperfusion 4hrs 40mins

In patients with a witnessed onset stroke, had a median time from onset of symptoms to establishment of reperfusion of 4hrs 40mins in patients undergoing thrombectomy in 2022

50% Functional Independence

50% of patients had a modified Rankin Score of 0-2 indicating achievement of full functional independence after thrombectomy.

Median Values for Thrombectomy patients At Beaumont Hospital



21 mins Door to CT

Median time from arrival at Beaumont hospital to CT Brain was 21 mins for patients undergoing thrombectomy.

39 mins Door to Needle Time

Median time from arrival at Beaumont hospital to receiving IV thrombolysis was 39 mins for patients undergoing thrombectomy.

49mins Door to EVT Referral

Median time from arrival in primary hospital to contacting Beaumont EVT centre, to make a decision about transfer for thrombectomy was 49mins (this metric was 70 mins to CUH.)

DIDO All EVT pts: 90 mins

DIDO All PitStop pts: 53 mins

Door In Door Out for EVT pts = 90mins
PitStop DIDO = 53mins

In 2022 the median time from arrival in PSC to departure for Beaumont was 90mins.
For the PITSTOP protocol the DIDO was reduced to 53mins.

For more information please contact The National Thrombectomy Service

TABLE OF CONTENTS

INTRODUCTION

Emergency thrombectomy is considered standard care for up to 24 hours following the onset of acute ischemic stroke following multiple RCT's. Based on this evidence, our inclusion criteria for thrombectomy includes all patients with LVO within 24 hours of onset of symptoms, with ASPECTS of ≥5 and good (>50%) collateral circulation on multiphase CTA. We employ a drip-and-ship model for the transfer of patients for thrombectomy, and in most cases a drip, ship, retrieve and leave model for those patients coming from hospitals within a 90 min drive - meaning immediate repatriation to the Primary Stroke Center (PSC) by the awaiting ambulance crew and accompanying medical team.

The National Thrombectomy Service Governance Group has developed a pathway for the transfer of patients for thrombectomy. The group meets quarterly to discuss the service, monitor activity and consider future development.

DESCRIPTION OF AUDIT PROCESS FOR ANNUAL REPORT

A prospective database is maintained for suspected stroke patients who are admitted to any of the PSCs. Patients are evaluated clinically and radiologically and if deemed suitable for endovascular thrombectomy are transferred to Beaumont Hospital/CUH. We collect information about all patients admitted with suspected acute stroke (FAST Positive). The majority of these will not require any consultation with thrombectomy centers at Beaumont Hospital/CUH. These patients are picked up in the national QI program. For others, there is a phone conversation with Beaumont Hospital/CUH and the patient may or may not be transferred. Once transferred most patients undergo thrombectomy but some become unsuitable for treatment. Data concerning patients are entered into the thrombectomy database, an electronic purpose built database designed by the National Thrombectomy Service (NTS) and Beaumont ITC department. All data for this 2022 annual report has been extracted from the NTS/stroke database which is housed on the Beaumont Hospital network.

CUH have a separate database (excel based) for their cohort of patients. Their data is sent to the thrombectomy service team in Beaumont to analyse and collate which gives an overall review of data nationally for those presenting to the two endovascular centers in Ireland.

OVERVIEW OF DATASETS

FAST POSITIVE (SUSPECTED STROKE PATIENTS) DATASET

Through the National Thrombectomy Service QI programme, data is captured by local stroke teams on any patients who present to any stroke centre with symptoms suggestive of acute stroke.

Data points include:

- Onset date/time
- Arrival date/time at PSC

- Time of CTB/CTA/CTP
- IV lysis time
- If EVT centre was contacted
- Time EVT centre contacted
- Time of decision re thrombectomy (regardless of whether or not EVT centre was contacted, or if the decision is not for thrombectomy).
- Departure time if transferred for thrombectomy.
- Final diagnosis

The decision time regarding need for thrombectomy is applicable to all patients. A yes/no decision reflects how long an ambulance crew would need to wait before being released, or completing the transfer of the patient to Beaumont Hospital or CUH.

This data is used for QI purposes to assess the performance of each stroke service and forms the basis for identifying service quality improvements required (see below for further discussion). The ability of each team to capture this information varies from hospital to hospital. There is overlap of this data with the dataset below and the outcomes are presented separately in this report.

REFERRALS DATASET

Previously, once a call was made to Beaumont Hospital thrombectomy service regarding possibility of thrombectomy, we recorded a minimum dataset as per QI dataset. As the volume of cases collected in each hospital for QI programme has increased we no longer keep this dataset, reducing duplication. We recognise however, that not all hospitals keep the full FAST positive database and some patients are not captured.

PATIENTS TRANSFERRED TO THE THROMBECTOMY CENTRE BUT UNSUITABLE FOR EVT DATASET

On arrival at Beaumont Hospital from PSC for thrombectomy patients are re-evaluated. Generally if >2hrs since original imaging, this is repeated. Some patients are found to be unsuitable for treatment due to a number of reasons (various reasons for unsuitability are noted in table 12 below). Avoiding unnecessary transfers and improving efficiency of transfer are targeted with this information.

THROMBECTOMY PATIENT DATASET

The most extensive and largest data set is of the patients who proceed to thrombectomy. There are approximately 65 data points on each patient, allowing detailed analysis of the service from onset of stroke to point of recanalisation and final clinical outcome at 90 days. This is the only national dataset which measures stroke outcomes at 90 days.

Patients who are transferred for thrombectomy are presented and discussed at the monthly stroke MDM held in Beaumont Hospital. WebEx video conferencing system allows referring sites to join this meeting remotely and have an input into the discussion regarding their patients. Each PSC receives an email with a list of their patients who are on the list for discussion at these meetings. They also receive a feedback form for each patient who is transferred and has treatment; this gives a summary of their time metrics and procedure/clinical outcomes.

Clinical follow up for patients post thrombectomy is given to us by the stroke CNS in each hospital. Our audit approval includes capturing the final outcome data and going forward we are collecting enough patient demographics to facilitate direct contact with patients/families to assess outcome if this is not otherwise available.

For this annual report, we analyse the above datasets. Data quality is checked by reviewing patient entries soon after input and again in preparation for the report. Outlying metrics are reviewed for accuracy of data. Imaging pre and post procedure, the procedure details and images including final revascularisation scores are reviewed by neuroradiology SPRs and consultants so that each study is double read.

QI data is collected by individual hospitals and sent to the QI lead. The data is collated and fed back to stroke teams intermittently through the year. Each team has had an opportunity to review their end of year data prior to submission in the annual report.

Completion of the report can only occur after the 90 day follow up assessments and the number of stroke discharges from all hospitals are available from HIPE. This report is compiled by members of the thrombectomy/stroke service team in Beaumont Hospital.

RESULTS

According to HIPE data, 5150 patients were discharged with primary diagnosis of cerebral infarctions in 2022 (i63 & i64) from hospitals with acute stroke services. 392 patients were transferred to Beaumont Hospital with a view to thrombectomy & 338 underwent thrombectomy, including 62 patients who presented directly to Beaumont Hospital or were inpatients at the time of their stroke. 54 patients were transferred but did not undergo thrombectomy as they were deemed unsuitable after clinical evaluation, repeat imaging or following catheter angiogram on arrival.

Furthermore, there were 173 patients transferred to CUH with a view to thrombectomy and 146 underwent thrombectomy, including 60 patients who presented directly to CUH. 27 patients were transferred but did not undergo thrombectomy.

THROMBECTOMY PATIENT DEMOGRAPICS (N=484)

- Male: 277 (57%)
- Female: 207 (43%)

Median Age: 73.5 (21-99)

≤65 years: 141 (29%)

>65 years: 343 (71%)

NIHSS & ASPECTS PRE EVT

Pre NIHSS (median): 14 (1-32)

Pre ASPECTS (median): 9 (1-10)

VESSEL OCCLUSION SITES

71(17%) patients had more than 1 vessel occlusion site or had additional significant carotid stenosis.

Table 2: Occlusion sites

Occlusion site	2022 N (%)
M1	172 (42)
M2 proximal	67 (16)
ICA cervical	47 (11)
Carotid T	44 (11)
Basilar	13 (3)
M2 distal+	38 (10)
ICA tandem stenosis	17(4)
ACA:	9 (2)
Other (Vertebral/PCA)	5 (1)

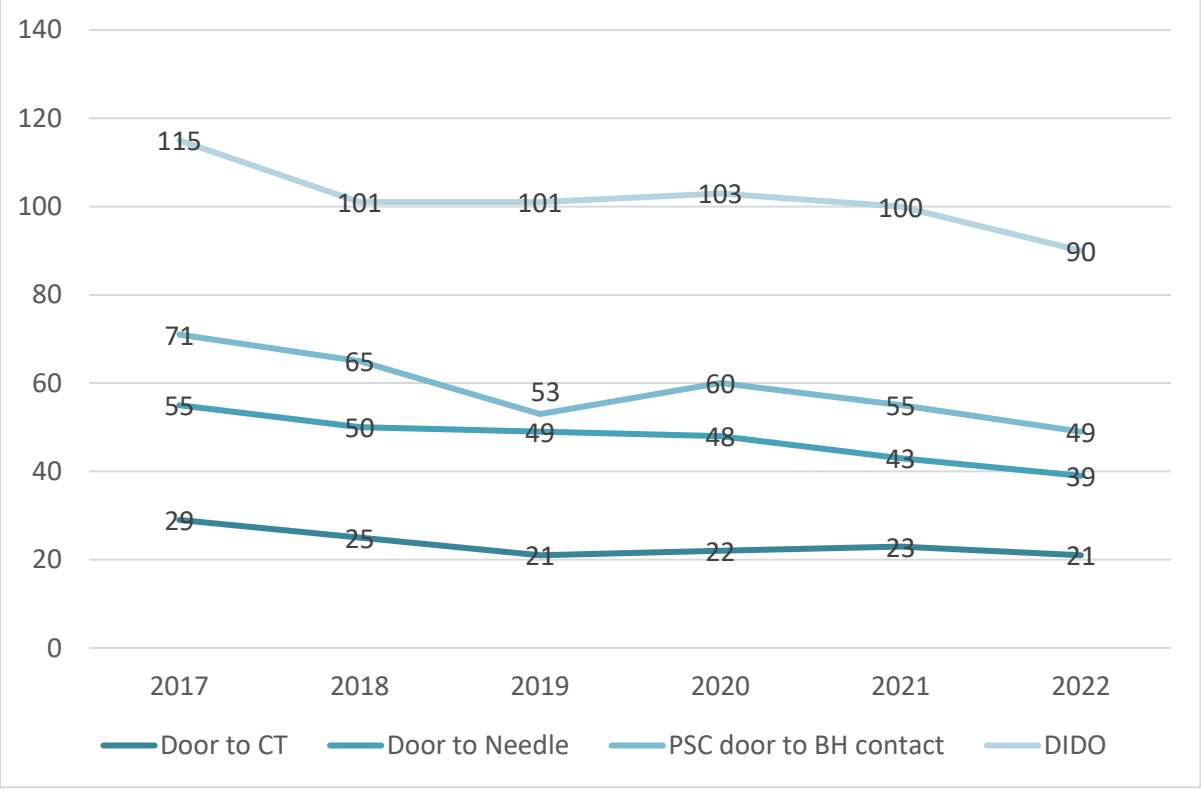
Table 3: EVT Rate 2022 vs 2021

	2022		2021	
Hospital	N of pts presenting to Hospital with Ischaemic Strokes	EVT rate N (%)	N of pts presenting to Hospital with Ischaemic Strokes	EVT rate N (%)
Bantry General Hospital	69	7 (10)	64	3 (5)
Beaumont	434*	62 (14)	307*	42 (14)
Cavan General Hospital	151	7 (5)	147	17 (11)
Connolly Hospital Blanchardstown	206	9 (4)	213	5 (2)
CUH	362*	60 (16)	431*	55 (13)
Galway University Hospital	239	19 (8)	262	19 (7)
Letterkenny General Hospital	200	13 (7)	168	7 (4)
Mater Misericordiae University Hospital	283	42 (15)	262	37 (14)
Mayo University Hospital	190	6 (3)	138	6 (4)
Mercy University Hospital	69	6 (9)	99	2(2)
Midland Regional Hospital Tullamore	100	3 (3)	110	1 (N/A)
Mullingar Regional Hospital	160	17 (11)	148	27 (18)
Naas General Hospital	208	23 (11)	178	17 (10)
OLOL Drogheda	206	22 (11)	244	20 (8)
OLOL Navan	56	1 (2)	N/A	NA
Portiuncula University Hospital	73	0	0	0
Sligo General Hospital	167	14 (8)	202	11 (5)
South Infirmary Victoria Hospital	N/A	1	N/A	1
St. James Hospital	216	19 (9)	235	18 (8)
St. Lukes Hospital Kilkenny	134	11 (8)	117	9 (8)
SVUH	369	34 (9)	395	39 (10)
Tallaght University Hospital	266	28 (11)	273	32 (12)
Tipperary University Hospital	121	9 (7)	102	4 (4)
University Hospital Kerry	136	9 (7)	131	6(4)
University Hospital Limerick	428	40 (9)	329	22 (7)
University Hospital Waterford	163	15 (9)	141	7 (5)

Wexford General Hospital	144	7 (5)	160	13 (8)
Belfast	N/A	0	N/A	N/A
Private Hospitals (Bons, SVUH Pri, BRC)	N/A	0	0	3
National Maternity Hospital	N/A	0	N/A	1
TOTAL	5150	484 (9.4)	4952	424 (8.5)

*This number excludes external referrals; it reflects no. of patients admitted directly to Beaumont Hospital or CUH

Figure 1: Median values for thrombectomy patients at Beaumont Hospital



TIME METRICS

BEAUMONT EVT CENTRE

Table 4: Door metrics of patients who underwent thrombectomy procedures at Beaumont Hospital. Inpatients who had a stroke are not included in these calculations.

Hospital	Total N 2022 {↑/↓ on 2021}	Door To CT Median {Range}	Door To Needle (DTN) Median {Range}	PSC door to BH contact Median {Range}	DIDO Median {Range}
Beaumont Hospital	62 {↑19}	00:18 ↔ {00:07-00:45} IQR{00:14-00:27}	00:29(n=20) ↑2mins {00:20-01:07} IQR{00:21-00:42}	N/A	N/A
Cavan General Hospital	7 {↓10}	00:21 ↓24mins {00:18–01:04}	00:57(n=2) ↓60mins {00:55-01:00}	01:38 ↓20mins {01:23-01:47}	02:27 ↓13mins {01:46-02:50}
Connolly Hospital Blanchardstown	9 {↑4}	00:08 ↓7mins {00:03-01:08} IQR{00:06-00:22}	N/A	00:29 ↓6mins {00:17-01:33} IQR{00:22-01:28}	01:05 ↓5mins {00:45-02:35} IQR{00:53-01:46}
Galway University Hospital	19	00:17↓7mins {00:05-00:40} IQR{00:13-00:22}	00:39(n=6) ↓13mins {00:14-00:50} IQR{00:35-00:50}	00:46 ↓9mins {00:10-01:22} IQR{00:32-00:57}	01:41 ↓16mins {00:47-03:42} IQR{01:05-02:02}
Letterkenny University Hospital	13 {↑6}	00:25 ↓4mins {00:11-00:44} IQR{00:17-00:32}	00:36(n=6) ↑19mins {00:20-00:48} IQR{00:31-00:45}	00:44 ↓29mins {00:33-01:50} IQR{00:38-01:25}	01:50 ↓17mins {01:05-03:35} IQR{01:19-02:02}
The Mater Misericordia University Hospital	42 {↑11}	00:23 ↔ {00:05-00:56} IQR{00:18-00:33}	00:53(n=14) ↑3mins {00:32-01:22} IQR{00:35-01:11}	00:48 ↑5mins {00:20-01:20} IQR{00:40-01:00}	01:29 ↑5mins {00:50-02:35} IQR{01:14-01:54}
Mayo University Hospital	6	00:51 ↑3mins {00:24-01:23}	N/A	01:29 ↓8mins {01:15-01:45}	02:40 ↓33mins {02:40-03:00}
Midland Regional Hospital Mullingar	17 {↓10}	00:24 ↑1min {00:08-01:15} IQR{00:14-00:39}	00:59(n=5) ↓ 3mins {00:23–01:21} IQR{00:26-01:20}	01:03 ↑7mins {00:13-02:22} IQR{00:45-01:44}	01:35 ↑8mins {00:39-03:05} IQR{01:22-02:25}

Midland Regional Hospital Tullamore	3 {↑2}	01:28 (n=1)	N/A	02:22 (n=1)	03:33(n=1)
Naas General Hospital	23 {↑6}	00:19 ↔ {00:08-00:35} IQR{00:14-00:28}	00:35(n=9) ↓8mins {00:19-00:55} IQR{00:23-00:41}	00:40 ↓1mins {00:20-01:12} IQR{00:30-00:54}	01:10 ↑11mins {00:25-02:20} IQR{00:49-01:18}
Our Ladys Hospital Navan	1	00:21(n=1)	N/A	01:07 (n=1)	02:13 (n=1)
Our Lady of Lourdes, Drogheda	22 {↑2}	00:22↑4mins {00:11-02:32} IQR{00:16-00:30}	00:57(n=8) ↑15mins {00:27-01:21} IQR{00:39-01:14}	00:58 ↓1min {00:24-03:53} IQR{00:38-01:17}	02:04 ↑10mins 00:46-04:50} IQR{01:21-02:20}
Sligo University Hospital	14 {↑3}	00:24 ↓5mins {00:06-00:56} IQR{00:19-00:38}	00:42(n=4) ↓3mins {00:36-01:37}	00:53 ↓2mins {00:09-01:34} IQR{00:41-01:19}	02:07 ↔ {00:29-03:30} IQR{01:36-02:25}
St James Hospital	19 {↑1}	00:19 ↓17mins {00:07-00:40} IQR{00:12-00:24}	00:51(n=8) ↓11mins {00:35-01:25} IQR{00:48-01:11}	00:51↓18mins {00:21-01:53} IQR{00:35-01:03}	01:38 ↓28mins {01:00-02:58} IQR{01:20-02:00}
St. Lukes Hospital Kilkenny	11 {↑2}	00:23 ↑7mins {00:15-00:36} IQR{00:19-00:30}	00:33(n=4) ↑6mins (00:32-00:57)	00: 45↑5mins {00:31-02:18} IQR{00:39-01:04}	01:50 ↑19mins {00:48-03:20} IQR{01:20-02:09}
St. Vincents University Hospital	34 {↓5}	00:23 ↑3mins {00:03-00:45} IQR{0014:-00:33}	00:38(n=13) ↓5mins {00:07-01:52} IQR{00:33-00:57}	00:48 ↑3mins {00:14-02:02} IQR{00:35-00:57}	01:30 ↓1min {00:38-03:22} IQR{01:07-01:45}
Tallaght University Hospital	28 {↓4}	00:17 ↓2mins {00:03-0:47} IQR{00:11-00:19}	00:40(n=9) ↑4mins {00:23-00:54} IQR{00:32-00:49}	00:42 ↓10mins {00:17-02:23} IQR{00:33-00:52}	01:08 ↓20mins {00:32-03:04} IQR{00:53-01:51}
University Hospital Waterford	1	00:36 (n=1)	00:45 (n=1)	01:22 (n=1)	01:25 (n=1)
Wexford General Hospital	7 {↓6}	00:27 ↓27mins {00:20-00:53} IQR{00:21-00:44}	00:32(n=1) ↓31mins	00:40 ↓70mins {00:40-01:26} IQR{00:40-01:08}	01:20↓58mins {01:00-02:26} IQR{01:05-01:57}
TOTAL	**338**	**00:21** ↓2mins **(n261*)** **{00:03-02:32}** IQR{00:15-00:29}	**00:39**↓3min **(n111)** **{00:07-01:51}** IQR{00:32-00:55}	**49:00** ↓6mins **(n218**)** **{00:09-03:53}** IQR{00:35-01:09}	**01:30** ↓10mins **(n219)** **{00:25-04:50}** IQR{01:10-02:05}

NB: Hospitals with <4 referrals do not have an IQR.

*One patient did not have CTB performed

**missing contact time on one patient.

CUH EVT CENTRE

Table 5: Door metrics of patients who underwent thrombectomy procedures at Cork University Hospital. Inpatients who had a stroke are not included in these calculations.

Hospital	Total {↑/↓ on 2021}	Door To CT Median {Range}	Door To Needle Median {Range}	Door To CUH Contact Median {Range}	DIDO Median {Range}
Bantry General Hospital	7 {↑4}	00:07↓21mins {00:01–00:28} IQR{00:02-00:22}	02:20 (n=1)	00:43↓17mins (n=4) {00:20–01:55}	00:46 (n=3) {00:45–00:48}
Cork University Hospital	60 {↑4)	00:17 ↓5mins {00:01–01:24} IQR{00:13-00:29}	00:42 ↑4mins (n=11) {00:19–01:28} IQR{00:23-01:04}	N/A	N/A
Mercy University Hospital	6 {↑4}	00:22 ↑19mins (n=1)	N/A	01:11mins ↑48mins (n=1)	N/A
South Infirmary Victoria University Hospital	1	00:59	01:16 (n=1)	N/A	N/A
Tipperary University Hospital	9 {↑5}	00:28 ↑12mins {00:12–00:52} IQR{00:13-00:33}	N/A	01:07 ↑20mins (n=7) {00:40-07:09} IQR{00:47-01:39}	N/A
University Hospital Kerry	9 {↑3}	00:14 ↓26mins {00:03–00:34} IQR{00:10-00:19}	00:55 ↓4mins (n=1)	01:19 ↓26mins (n=6) {00:37-06:10} IQR{00:55–01:53}	02:38 (n=4) {02:34–09:10}
University Hospital Limerick	40 {↑19}	00:31 ↑6mins {00:06–01:08} IQR{00:21-00:39}	01:04 ↑19mins (n=6) {00:39–01:48} IQR{00:47-01:40}	01:14↑22mins (n=27) {00:32–04:15} IQR{01:00-01:45}	02:05 (n=13) {01:10–05:45} IQR{01:38-02:41}

University Hospital Waterford	14 {↑7}	00:22 ↓9mins {00:04–01:01} IQR{00:12-00:28}	01:06 ↑26mins (n=2) {00:41–01:32}	00:49 ↓9mins (n=8) {00:30–01:47} IQR{00:38-01:27}	01:03 (n=2) {01:03–01:38}
Total	**146**	**00:22 ↓1min (n121) {00:01–1:24}** IQR{00:14-00:33}	**00:50↑7mins (n22*) {00:19–02:20}** IQR{00:39-01:21}	**01:10↑14mins (n53**) {00:07–07:09}** IQR{00:52-01:03}	**02:05 (n22***) {00:07–07:09}** IQR{0:45-09:10}

NB: Hospitals with <4 referrals do not have an IQR

*Missing IV lysis times on 3 patients.

**Missing contact times on 18 patients.

***Missing Dept time on 49 patients.

Door to CT and DTN times reflect internal hospital processes related to early patient clinical and radiological evaluation with a view to intravenous thrombolysis which is standard of care for over 20 years, following the pivotal NINDS trial in 1995. The American Heart Association guidelines recommend DTN times of less than 60 mins, aiming for less than 45 mins. The most efficient hospitals in the world achieve DTN times of approximately 15mins. Every minute counts. Save a minute, save a week!!

The median door to CT is 23mins and the door to needle is 43mins (n=134) for patients receiving thrombectomy in BH and CUH.

The overall IV lysis rate for patients referred to Beaumont & CUH thrombectomy centers who underwent EVT in 2022 was 33% (n=160). IVT remains the standard of care for all eligible patients with large vessel occlusion, in addition to thrombectomy.

Table 6: Beaumont Hospital & CUH EVT group IV lysis rates:

EVT Centre	2022	2021	2020	2019
Beaumont Hospital	38% (n127)	32% (n134)	43% (n131)	42% (n130)
Cork University Hospital	23% (n33)	21%	N/A	N/A

The volume of stroke patients / EVT patients is very small in many hospitals. 7 (out of 18) hospitals transferred less than 10 patients for EVT to Beaumont; 5 (out of 7) hospitals transferred less than 10 patients for EVT CUH Hospitals.

TENECTEPLASE

Alteplase has been the standard of care thrombolytic agent for acute ischaemic stroke following pivotal NINDS and ECASS III randomised controlled trials (RCTs) in 1995 and 2008 respectively. Tenecteplase is

a genetically modified tissue plasminogen activator with higher fibrin specificity, a longer half-life and reduced binding to PAI-1 (plasminogen activator inhibitor 1), which leads to greater resistance to inactivation by PAI-1, compared to alteplase. Thus, tenecteplase could potentially be associated with greater recanalization and lower bleeding risk than alteplase. It is given as a single intravenous bolus without the need for an infusion offering further pragmatic advantages.

The evidence base for tenecteplase in acute ischaemic stroke (AIS) is growing, with several completed RCTs and meta-analyses to date demonstrating non-inferior safety and efficacy relative to alteplase and possible superiority for early recanalization. A large non-inferiority RCT, the ACT trial, was published in 2022 in the Lancet and confirmed Tenecteplase as a reasonable alternative to alteplase for all patients presenting with acute ischaemic stroke who meet standard criteria for thrombolysis. Many international stroke guidelines now support tenecteplase as an option for stroke thrombolysis.

It is anticipated that the use of tenecteplase in stroke thrombolysis will increase as more data accumulates demonstrating safety and efficacy with potentially improved vessel recanalization and faster door to needle times.

DOOR TO GROIN PUNCTURE

Time from arrival in Beaumont Hospital & CUH to groin puncture reflects efficiency in interventional radiology and stroke services, as each time interval affects patient outcome. In-patient strokes are excluded. The analysis of this has been done (table 7) separately for those presenting directly to Beaumont Hospital & CUH and for those on a Drip & Ship model transferred from elsewhere versus direct presentation to Beaumont Hospital and CUH.

Table 7: Time from arrival to groin puncture

EVT Centre	Door to Groin	Drip & Ship Model
Beaumont Hospital	01:03 ↑11mins (n43) IQR {00:40- 01:24}	00:11 ↓4mins (n276) IQR {00:08- 00:21}
Cork University Hospital	01:23 ↓9mins (n50) IQR {01:02-01:38}}	00:33 ↓11mins (n85) IQR {00:26-00:45}

Table 8: Time metrics for thrombectomy procedures carried out in Beaumont Hospital and CUH

EVT Centre	Median length of procedure	Median time groin puncture to 1st reperfusion
Beaumont Hospital	00:26 ↓3mins	00:19 ↓1min (n323)
Cork University Hospital	00:46 ↑6mins	00:23 ↓2mins (n132)

OUTCOMES

TICI RECANALISATION

TICI recanalisation reflects the technical success of the Thrombectomy procedure for anterior circulation strokes only. Rates of 2b, 2c & 3 are considered good and expected rates internationally are 80% for 2b-3 inclusive. Thrombectomy can be performed using aspiration technique or stentriever. Randomised trials have shown equivalence. We have published our experience using a standardised aspiration first approach which in our experience gives better recanalisation in a shorter time. Evidence also suggests that the fewer passes performed, the better the likely clinical outcome. First pass effect is a measure of the success of recanalisation after a single pass.

In 2022 we achieved TICI 2b or better in 93% in anterior circulation strokes (ie excluding basilar occlusion).

Table 9: First pass TICI Recanalisation rates (Beaumont only)

TICI post scores post 1st pass	2022 N (%)	2021 N (%)
2c-3:	136 (42)	121 (42)
2b:	58 (18)	65(22)
2a:	56 (17)	50(17)
0-1:	73 (23)	57(19)

Table 10: Final TICI recanalisation rates (Beaumont and CUH)

TICI Post Scores	2022 N (%)	2021 N (%)	2020 N (%)	2019 N (%)	2018 N (%)
2c-3:	237 (73)	189 (64)	192 (66)	183 (63)	182 (73)
2b:	65 (20)	93 (32)	74 (25)	68 (24)	46 (19
2a:	11 (4)	9 (3)	11(4)	25 (7)	12 (5)
0-1	10 (3)	4 (1)	14 (5)	12 (6)	6 (3)

THE NIH STROKE SCALE

The NIH Stroke Scale (NIHSS) measures stroke related neurologic deficit. This assessment is carried out when a patient presents to their PSC with stroke symptoms, before patients proceeds to endovascular thrombectomy, at 24hrs & Day 5 post endovascular thrombectomy. When measured at 24hrs a score of ≤8 is highly predictive of long term functional outcome for anterior circulation stroke (Meyer *et al.,* 2020).

In 2022, 24hr NIHSS of ≤8 was achieved in 52%.

Table 11: NIHSS post EVT treatment (BH & CUH)

	2022	2021	2020
NIHSS @ 24hrs	8 (n423)	6 (n394)	9 (n379)

MODIFIED RANKIN SCALE

The Modified Rankin Score (mRS) is a 6 point scale reflecting the level of disability/dependence in daily activities of people who have suffered a stroke. 90 day mRS indicates the 90 day clinical outcome and is an international standard in stroke literature reporting.

Clinical outcomes obtained through the NTS continue to match those of international practice in the patients who are fortunate enough to access the service. 48% of the patients treated by thrombectomy recovered to full independence (modified Rankin Score 0-2) following their LVO stroke. The mortality rate was 20%. This real world experience matches that achieved in multinational randomised controlled trials (HERMES). However, stroke centres around the world continue to strive to improve outcomes by changing systems of care and have made progress.

In 2022, 90 day mRS of ≤2 indicating achievement of functional independence was achieved in 50% ↑ 2% on 2021

In 2022, 90 day mRS of ≤2 was achieved in 50% (n225) of patients who underwent thrombectomy at Beaumont Hospital and CUH. 90 day mRS outcome was available in 94% (n453) of patient who underwent thrombectomy.

Figure 2: 2022 Modified Rankin Score at Day 90

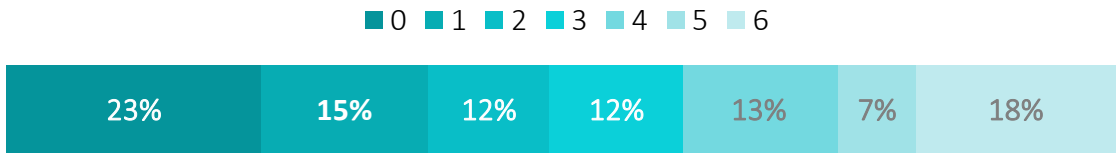
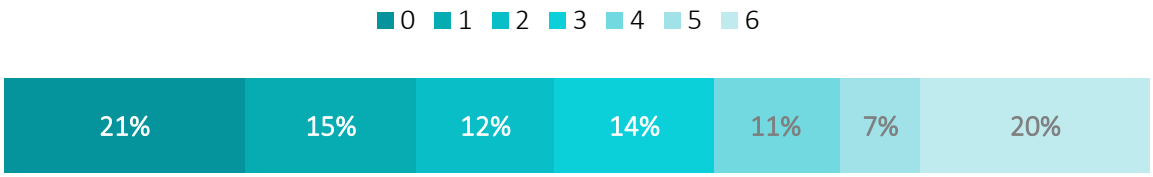


Figure 3: 2021 Modified Rankin Score at Day 90



PATIENTS TRANSFERRED TO THROMBECTOMY CENTRE BUT UNSUITABLE FOR EVT

Some patients will not be suitable for thrombectomy despite being referred. Some patients will improve with thrombolysis or spontaneously. Other patients will deteriorate rapidly with or without thrombolysis. Factors involved in patients becoming unsuitable include; the time from stroke onset, the type of artery blocked the collateral score and the distance between their PSC and the endovascular centre.

Table 12: Reasons for unsuitability for thrombectomy for those transferred to Beaumont Hospital

Unsuitability Reason	N (%)
Clinical Improvement	8 (15)
No LVO/Recanalised	30 (56)
Established infarct	5 (9)
Haemorrhagic transformation	1 (2)
Other	10 (18)

OVERALL DATASET

Comparing these data groups we get a better picture for larger number of stroke patients. We note that patients with shorter door to CT, DTN and DIDO times are more likely to be transferred and treated.

Table 13: Overview of Beaumont Hospital Group Figures

Beaumont Hospital EVT centre	Year	Door to CT median	Door to needle median	Door to BH contact median	DIDO (hr:min) median
EVT	**2022 (n338)**	**00:21 (n261)**	**00:39 (n111)**	**00:49 (n218)**	**01:30 (n219)**
	2021	00:23	00:43	00:55	01:40
	2020	00:22	00:48	01:00	01:43
	2019	00:21	00:49	00:53	01:41
	2018	00:25	00:50	01:05	01:41
Transferred but deemed unsuitable on arrival at Beaumont Hospital	**2022 (n54)**	**00:30 (n36)**	**00:54 (n19)**	**01:07 (n36)**	**02:11 (n32)**
	2021	00:22	00:55	01:04	02:03

	2020	00:35	00:51	01:12	02:04
	2019	00:30	00:57	01:17	02:08
	2018	00:31	01:00	01:27	02:20
TOTAL	**2022 (n392)**	**00:22 (n297)**	**00:43 (n130)**	**00:51 (n254)**	**01:35 (n251)**
	2021	00:23	00:45	00:56	01:42
	2020	00:27	00:52	01:10	N/A
	2019	00:26	00:50	01:09	N/A
	2018	00:30	00:52	01:20	N/A

Table 14: Overview of Cork University Hospital Group Figures

Cork University Hospital EVT centre	Year	Door to CT median	Door to needle median	Door to CUH contact median	DIDO median
EVT	**2022 (n146)**	**00:22 (n121)**	**00:50 (n22)**	**01:10 (n53)**	**02:05 (n22)**
	2021	00:23	00:43	00:56	N/A
	2020	00:30	00:42	N/A	N/A

PITSTOP PROTOCOL: PROTOCOL FOR IMPROVING TIMES FOR STROKE PATIENTS REQUIRING ONWARD TRANSFER FROM PRIMARY STROKE CENTRE TO THROMBECTOMY CENTRE

In 2018/2019, a new protocol was introduced in Naas General Hospital in conjunction with the NAS and Beaumont Hospital/National Thrombectomy Service Quality Improvement. This resulted in a reduction of the DIDO times for patients from 96mins to 45mins. This protocol, now known as PITSTOP, was extended in Oct 2020 to include MRHM and TUH. In December 2022 this was further extended to include Galway University Hospital, with discussions between several other hospitals (The Mater, Kilkenny, Limerick & OLOL) for inclusion in 2023.

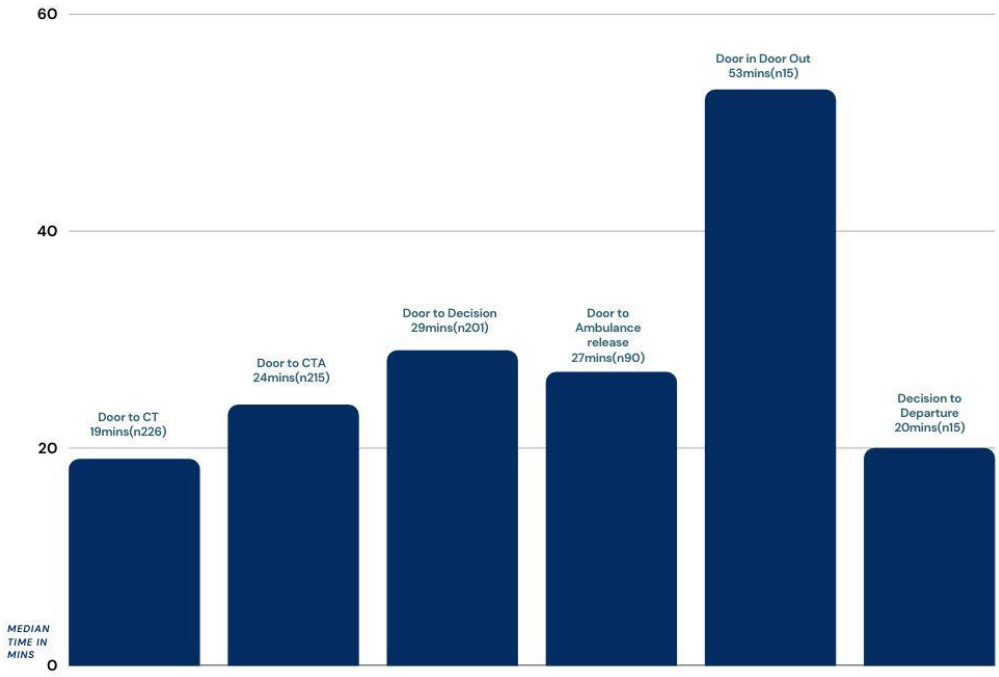
In this protocol, the ambulance crew waits with the patient on arrival to the PSC until a decision is made whether or not to transfer the patient to the endovascular stroke centre. In order for this to operate, the door to decision time must be reduced to under 30 minutes.

Certain criteria have been identified as beneficial in the efficient response (under 30 mins) for the FAST PitStop patients:

- The use of a one page/bleep system to alert the team of the incoming PITSTOP patient
- NAS input in the training, preparation and feedback for PITSTOP involvement
- data collection for measuring efficiencies
- the use of a critical care trolley for transfer

To measure the success of the PITSTOP protocol, data is required. As the hospitals involved are already in the QI project 'Door to Decision in 30!' the majority of the data has been continuously collected and analysed. For the PITSTOP protocol, additional data has been included to measure the efficacy of this initiative; notably 'Time of ambulance crew release', and 'Time from Decision to Departure'.
The 2022 PITSTOP data contains the data collected in MRHM , TUH &GUH only.

Figure 4: Median time in mins of all PITSTOP data times stamps for 2022 (n240)



DOOR IN DOOR OUT TIMES OF PITSTOP PATIENTS (DIDO)

In 2022 there were 249 patient data sets captured using the PITSTOP protocol , 15 patients who had an LVO amenable for mechanical thrombectomy were transferred for EVT to Beaumont Hospital.

Of these 15 patients transferred to Beaumont, their DIDO median times =53mins (n15),

- MRMH median DIDO = 46mins (n6)
- TUH median DIDO = 55mins (n8)
- GUH median DIDO = 40mins (n1)

The PITSTOP protocol DIDO times, compares favorably with the DIDO times for the full group of Beaumont EVT patients which is 90mins (n219). Note that the four hospitals using the PITSTOP protocol are in the top four rankings for DIDO.

To note the majority of FAST stroke patients brought into TUH arrive via the Dublin Fire Department (DFB) rather than the National Ambulance Service (NAS). As DFB do not make interhospital transfers, currently they are not included in the PITSTOP protocol.

PITSTOP DOOR TO CT/CTA & DECISION TIMES

Our PITSTOP data not only shows a significant reduction in the DIDO for patients transferred for thrombectomy, but also the additional various non-thrombectomy benefits for those patients identified as not suitable for referral for EVT.

The PITSTOP data shows faster Door to CT/CTA and decision times compared to all FAST data (see table below).This shows that the patients under the PITSTOP protocol are processed quicker than non PITSTOP patients.

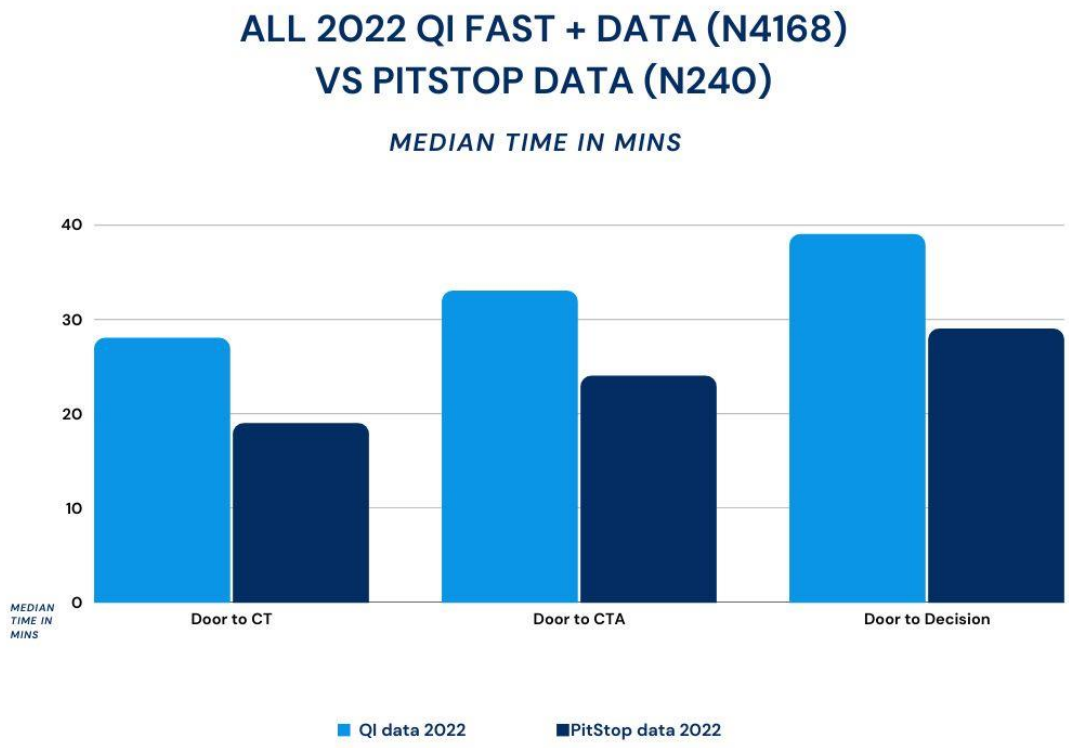
PITSTOP patients 2022 data: (Median times)

- Door to CT 19mins (n226)
- Door to CTA 24mins (215)
- Door to Decision 29mins (n201)
- DIDO 53mins (n15)

QI FAST patient 2022 data: (Median times)

- Door to CT 28mins (n3406)
- Door to CTA 33mins (n2639)
- Door to Decision 39mins (n2963)
- DIDO 90mins (n392 – BH EVT patients only)

Figure 5: 2022 ALL FAST positive patients (n4168) versus PITSTOP patients (n240)



AMBULANCE RELEASE TIMES

One of the key metrics of the PITSTOP protocol is the door to ambulance release time and this must be kept to under 30mins, in order to not delay the ambulance crew. Challenges still remain and the PITSTOP hospitals have yet to achieve the Naas times of DIDO.

In 2022 the median door to ambulance release time was 27mins (n90), similar to the 2021 PITSTOP times. The impact on the door to ambulance release time is significant for both MRHM and TUH (MRHM =27mins (n61); TUH = 25mins (n27). This means that for non EVT patients the decision is made, and the ambulance teams are released in under27 mins for both hospitals. This is better than the ambulance release times achieved in the Naas project as additional emphasis was placed on this aspect. Of note even though there are 240 pts under the PITSTOP protocol not all ambulance release times or decision times are captured for these patients.

MRHM door to ambulance release time = 27 mins (n61)
TUH door to ambulance release time = 25mins (n27)

6% (15) of all PITSTOP protocol patients were referred to Beaumont for EVT in 2022

The PITSTOP protocol developed is widely applicable and can easily be adopted by other hospital sites where a rapid door-to-decision can be achieved by an already highly functioning acute stroke team.

NATIONAL THROMBECTOMY SERVICE

PitStop

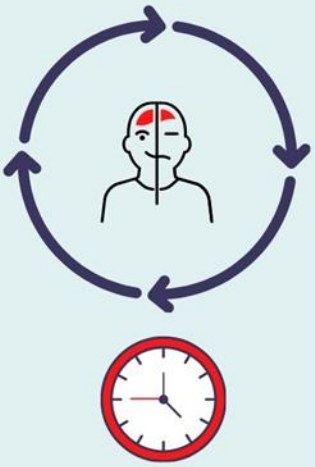
Protocol for Improving Times for STroke patients requiring Onward transfer from Primary stroke centre to thrombectomy centre.

In 2018 a pilot project was carried out between Naas General Hospital , the National Ambulance Service (NAS) and Beaumont Hospital. The ambulance crew wait with the patient on arrival to the receiving hospital (PSC) until a decision is made regarding need for EVT.
in 2022 this pilot protocol , now known as PitSTop has been extended to a further 3 hospitals, Galway University Hospital (GUH), Mullingar Midland Regional Hospital (MMRH) & Tallaght University Hospital (TUH). With another 4 hospitals planning to join in 2023.
Significant improvements have been made on the DIDO times for patients referred for an EVT.
In 2022 the door to ambulance release times have been achieved in under 27mins by the PitStop protocol.

PitStop Protocol

The patient will be transferred for EVT by the same ambulance crew that transported the patient to the receiving hospital.

Ambulance crews transporting patients to these hospitals will pre alert the receiving hospital.



Decision re suitability for EVT is completed as quick as possible

On arrival to the ED the ambulance crew are met with a member of the stroke team.

PitStop Data

For more information please contact Roisin Walsh (QI Lead, The National Thrombectomy Service) roisinwalsh@beaumont.ie

The official collaborative process, comprising formal learning sessions and action periods, ended in June 2019. However in 2022, 18 of the original 24 hospitals continued to participate (excluding Limerick, Portinucla, Naas, St James, Sligo & SVUH). These hospitals committed to continue engaging with the project and almost all managed to continue collecting data and testing service improvements into 2022.

Despite the continued challenges of Covid 19, in 2022 the hospitals involved in the 'Door to Decision in 30!' project managed to collect substantial amounts of FAST+ patient datasets. Increasing the amount of FAST data sets captured to 4168, up almost 400 data sets from 2021. Even with this increased volume of data collected in 2022 the times of Door to CT/CTA and Decision remains consistent with 2021 data.

Congratulations to all on continued improvements and sustainability.

By capturing these data points, we are identifying the acute FAST response and quick decision making regarding the ongoing care for the patient.

The data collected by each team aims to reflect not only the patients journey from arrival to the hospital, to decision for those who progress to EVT, but also the activities of the teams responding to all the FAST calls, even if the patients do not require thrombectomy or are not having a stroke.

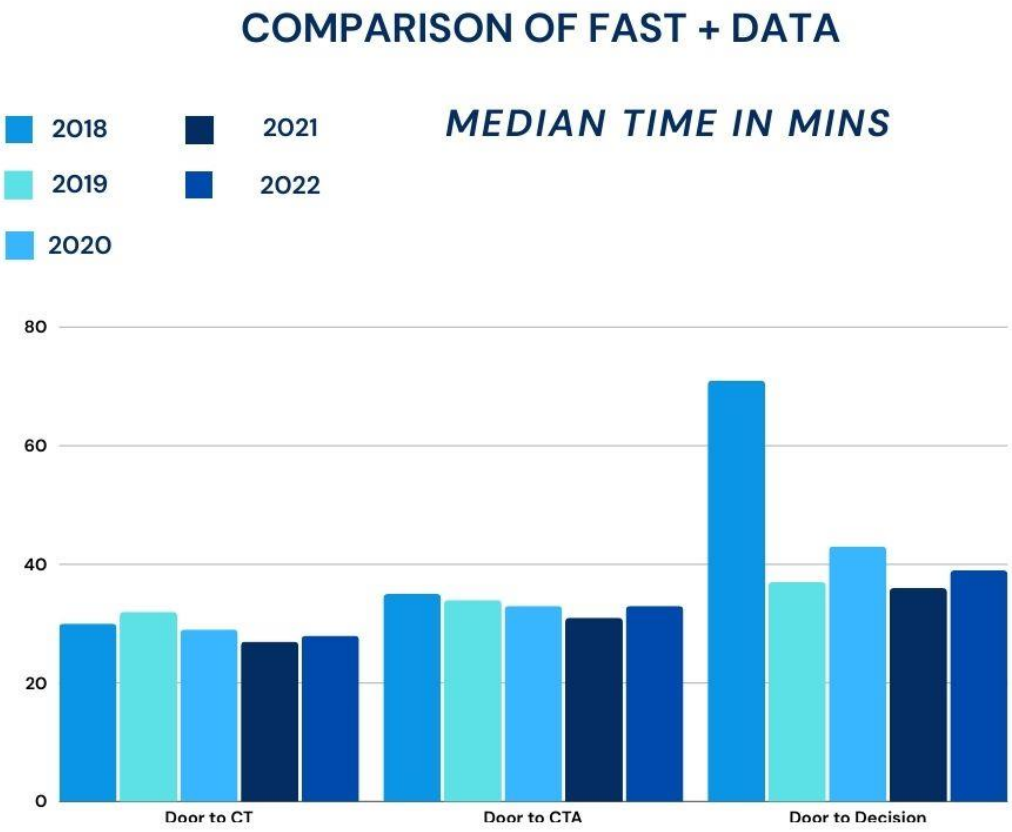
Many of these patients would not be captured in the INAS report but do represent a considerable workload for any give stroke service. We do acknowledge that not all FAST+ calls have been captured or have completed data sets as each team vary in their ability to continue to collect the data.

Table 16: 2022 Comparison of FAST positive data

Date Range	Fast+ Patients Total	Total "Time Of Decision" Recorded (%)	Median Door To CT[1] {IQR}	Median Door To CTA[1] {IQR}	Median Door To Decision[1] {IQR}
Jan – Dec 2018[1]	383	59 (15.4%)	30mins {17-78mins} n358	35mins {24-66mins} n272	71mins {42-131mins} n54
Jan – Dec 2019[2]	3740	1562 (43.4%)	32mins {18-61mins} n3050	34mins {22-59mins} n2131	37mins {23-62mins} n1462
Jan – Dec 2020[3]	3796	1891 (50%)	29mins {18-53mins} n3345	33mins {23-53mins} n2452	43mins {27-68mins} n1830
Jan – Dec 2021[4]	3776	2656 (70%)	27mins {18-48mins} n3175	31mins {23-49mins} n2404	36mins {23-59mins} N2656
Jan- Dec 2022[5]	4168	2963 (71%)	28mins {17-45mins} n3406	33mins {23-50mins} n2639	39mins {24-60mins} N2963

- [1] 17 hospitals
- [2]23 hospitals (St. James not included)
- [3]22 hospitals in total (St. James & Portiuncula not included)
- [4]20 hospitals in total (Naas, St. James ,Portinuncula, & SVUH not included)
- [5]18 hospitals in total (Limerick, Naas, St. James ,Portinuncula, Sligo & SVUH not included)

Figure 6: 2022 Comparison of FAST positive data

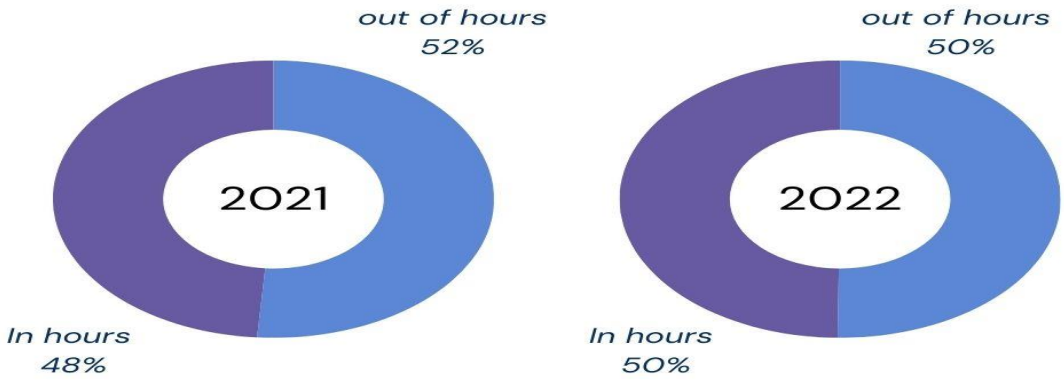


IN HOURS VERSUS OUT OF HOURS

For this report the 'in hours' is defined as Monday to Friday 8am to 5pm and the 'out of hours' is defined as all other times (including public holidays and weekends).

The initial focus of the QI project was to concentrate on the 'in hours' systems and processes, with the aim of making changes to improve these processes. The 'out of hours' processes have also improved as a result but delays still exist. The proportion of patients who presented 'in hours' and 'out of hours', remained consistent throughout 2022.

Figure 7: Comparison of number of patients presenting as FAST positive in hours versus out of hours per year.



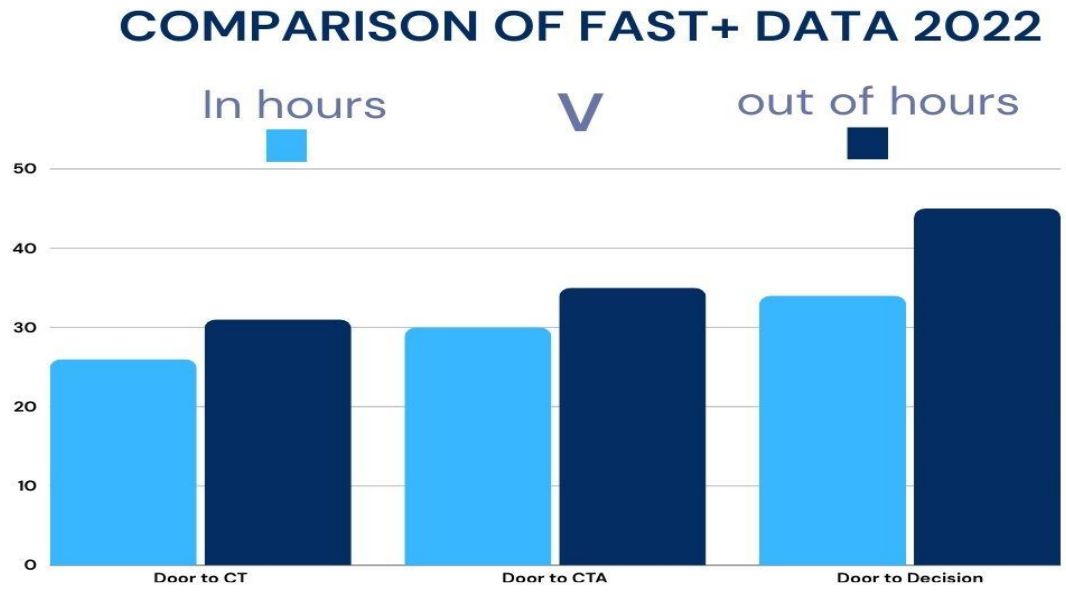
As per (Fig 9) below ,the 'in hours' times for Door to CT, Door to CTA, & Door to Decision in 2022 have remained consistent compared to 2021 times, but the 'out of hours' times still remain slower. Whilst trying to provide a 24/7 stroke service, challenges persist including lack of access to imaging and reports, not having staff onsite 24/7 and lack of access to key clinical decision makers.

Considering the number of patients presenting 'in hours' & out of hours is split 50/50 this shows the importance of establishing standardized processes which can be adapted for 24 hours per day.

In hours n 2095

OOH n 2080

Figure 9: Comparison of FAST positive Data in hours versus out of hours



ROOM FOR IMPROVEMENT

Whilst the data for 2022 shows sustained times, there is always room for improvements. Part of the QI process is to ensure that the improvements made are sustainable. For the results of the collaborative to be sustained and improved it is important that the work is owned and integrated into mainstream services and infrastructure.

The National Stroke Strategy for 2021-2026, (National Stroke Programme, 2020) recognise that the acute treatment for patients with ischaemic stroke, especially in the time sensitive treatments of thrombolysis and thrombectomy, is an area requiring continuous quality improvement.

A recommendation from the strategy is that all hospitals receiving acute stroke patients have a specialist-led rapid access stroke service or access to such a service within their hospital network. This service must have adequate staffing and diagnostic resources to provide 24/7 acute stroke care and treatment. It is also recommended that all patients recovering from a stroke have access to a similar specialist secondary prevention stroke service and diagnostics (NSP, 2020).

In 2022 for the QI project we had data from 18 PSC's across Ireland; from these hospitals a larger number of data sets was collected than previous years. Not all hospitals were able to collect and send the FAST data for review. Data is essential for this project and we will continue to collect, analyse and report back on all data collected on a regular basis (every 2 months).

Going forward we are asking that each team choose a specific area where they would like to make an improvement eg Door to TPA times, and / or a specific intervention they would like to introduce to their process we then need to measure the impact of that intervention.

Continuous quality improvement is required to ensure old patterns of working do not remerge

The need for continuous quality improvements highlights the importance for teams to lock in the progress that has been made and to continually build upon it.

The QI process has shown us how to set goals, identify change ideas and measure to see if changes are an improvement. Going forward we can continue to apply these techniques in response to patients' needs, best practices and policy changes

QI DATA:

The data was collected by participating hospital throughout 2022.This data was sent to the QI lead where it was ananylsed and report tables. Many thanks to those who collected and sent the data. The data reports were sent to each hospital for discussion at the local steering group meetings.

The following table shows the analysis of the QI data collected by participating hospitals for 2022.

Table 17: 2022 Fast Positive Patient Data by Individual Hospital

Hospital	Date Range	2022 Fast+ Patients Total N {2022 Total Ischaemic Strokes as per HIPE }	Total "Time Of Decision" Recorded (%)	Median Door To CT[1] Mins {IQR}	Median Door To CTA[1] Mins {IQR}	Median Door To Decision Regarding Thrombectomy[1] Mins {IQR}
[2]Bantry	Jan – Nov 2022	42 {69}	30 (71%)	8 (↓6mins) N41	14(↓16mins) N25	25(↓12mins) N30
Beaumont	Jan – Dec 2022	617 {434}	387 (63%)	32(↑5mins) N476	35(↑4min) N438	40(↑5min) N387
[3]Cavan General Hospital	Jan – Dec 2022	134 {151}	8 (6%)	46(↓1mins) N132	56(↑4mins) N117	113mins (↑3mins) N8
Connolly Hospital	Jan – Dec 2022	113 {206}	113 (100%)	17(↓7mins) n105	23(↓7mins) N84	24(↓6mins) N113
Cork University Hospital	Jan – Dec 2022	595 {362}	578 (97%)	30(↓2mins) N504	37(↑5mins) N273	37(↑7mins) N578
[3]OLOL Hospital Drogheda	Jan – Dec 2022	191 {206}	182 (95%)	25(↑7mins) N141	33 N126	41 N182
University Hospital Galway	Jan – Dec 2022	343 {239}	153 (45%)	23(↓6mins) N232	28(↓2mins) N194	45(↓6mins) N153
University Hospital Kerry	Jan – Dec 2022	243 {136}	235 (97%)	18(↓4mins) N241	25(↓3min) N220	60(↔) N235
St Lukes Hospital Kilkenny	Jan – Dec 2022	137 {134}	102 (75%)	34(↓3mins) N82	35(↓2min) N44	24(↓18mins) N102
Letterkenny University Hospital	Jan – Dec 2022	131 {200}	105 (80%)	26(↓6min) N130	31(↓4mins) N124	60(↑15mins) N105
Mater Misericordiae	Jan – Dec 2022	431 {283}	129 (30%)	26(↑6mins) N415	32(↑7mins) N386	51(↑15mins) N129
Mayo University Hospital	Jan – Dec 2022	17 {190}	50 (43%)	54(↓4mins) N16	63(↑9mins) N12	153(↑70mins) N2
Mercy University Hospital	Jan – Dec 2022	2 {69}	2 (100%)	26(↑1mins) N2	31(↓23mins) N2	55(↑17mins) N2
MRH Mullingar	Jan – Dec 2022	228 {160}	174 (78%)	22(↔) N216	28(↑1mins) N210	30(↓5min) N174
South Tipperary General Hospital	Jan – Dec 2022	105 {121}	105 (100%)	24(↔) N105	33(↓1mins) N53	31(↓5mins) N105

Tallaght University Hospital	Jan – Dec 2022	201 {266}	144 (72%)	24(↔) N173	27(↓2mins) N150	33(↓3mins) N144
University Hospital Waterford	Jan – Dec 2022	204 {144}	41 (20%)	37(↑1min) N171	44(↑2min) N120	55(↑10mins) N41
Wexford General Hospital	Jan – Dec 2022	269 {163}	184 (70%)	46(↓11mins) N69	53(↓15mins) N39	20(↑3mins) N184

- [1]Excluding inpatients
- [2]Not a full year of data provided
- [3]Data provided was Thrombectomy/Thrombolysis only pts

NOTE: The number (n) is not always the full number of patients treated, this number can include inpatients, those who may not have had a CT or CTA, or not have had a decision time recorded

All the above data shows the 'n' of the times captured, this is not always the complete and full number as some times are not captured eg some patients may not go on to have a CTA following a CT scan.

Although the overall data demonstrates improvement in each metric, there remains variability between hospitals. It is also interesting to note the variation in volume of fast calls registered compared with the number of stroke discharges as per HIPE data. Here we also see that the hospitals participating in PITSTOP protocol have high volumes of FAST patients captured.

In 2022, 9 hospitals attained median Door to Decision times of less than 40mins. Of these 9 hospitals, 7 have achieved a median Door to Decision time of 35mins or less, with 5 hospitals attaining median Door to Decision times of less than 30mins.

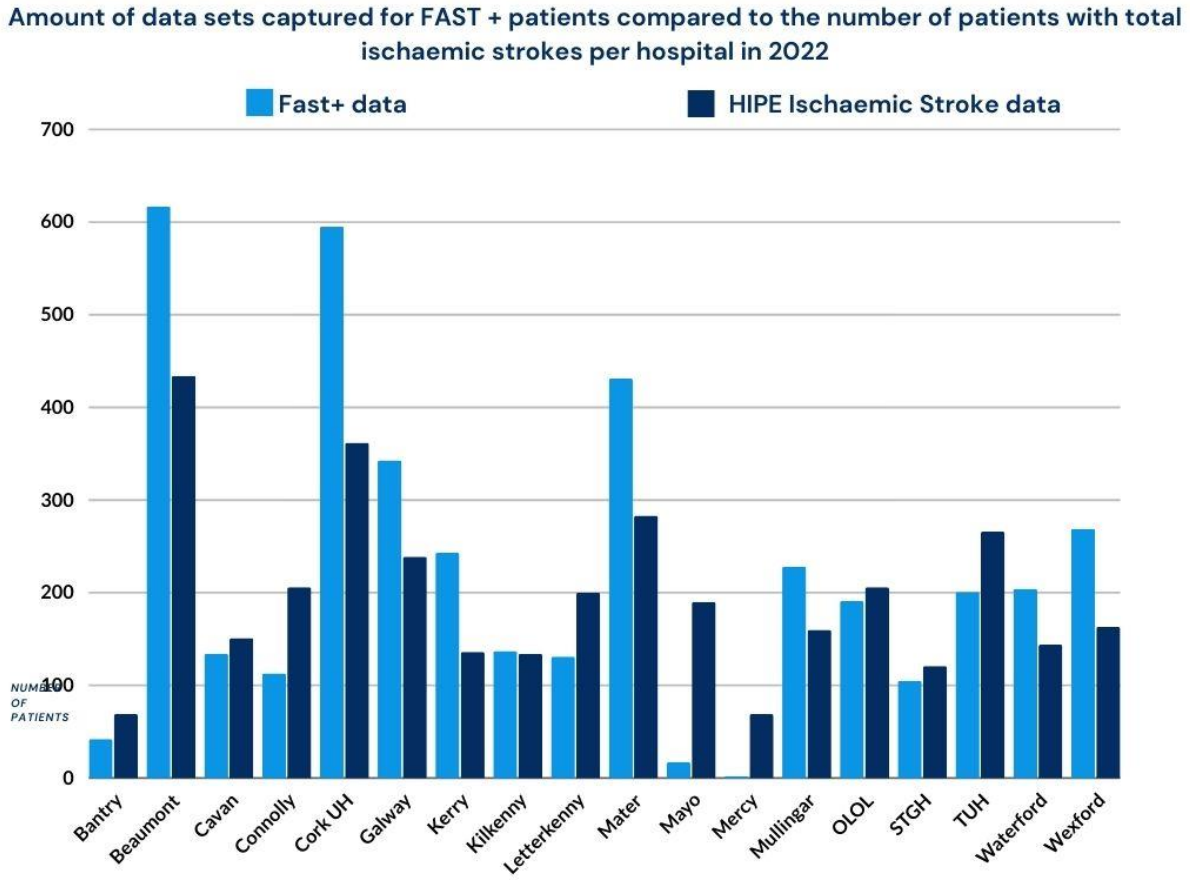
9 hospitals attained median door to decision times of less than 40mins. Of these, 9 achieved a time of 35mins or less, with 5 hospitals attaining median door to decision times of less than 30mins

The QI process involves the collaboration and cooperation of the wider MDT, however special thanks must go to the Clinical Nurse Specialists and Advanced Nurse Practitioners for their ongoing leadership of local improvement efforts and their commitment to the collection of this data.

Limitations in data collection: It is worth noting that data collection practices and definitions can vary between hospitals; therefore, the comparison of individual hospitals should be undertaken with caution. We have however engaged with teams to minimize the differences. We do acknowledge that not all FAST+ calls have been captured or have completed data sets, as each team vary in their ability to collect the data.

The following figure (fig 10) compares the number of FAST data sets captured for the QI project compared with the HIPE numbers of Ischaemic stroke per hospital.

Figure 10: Amount of FAST positive data sets per hospital in 2022 versus the amount of total ischaemic strokes recorded on HIPE in 2022.



Note that GUH and Mullingar are engaged in the PITSTOP protocol and so all FAST data is captured, significantly more than the volume of stroke discharges. This is likely a true reflection of the expected relative volume of FAST calls.

Door to Decision in 30!
2022 QI Review

A Quality Improvement Project for the care of patients with acute ischaemic stroke commenced in 2018.
The aim of this collaborative is to reduce the door to decision time .
18 teams continued into 2022 to collect the data and sustain improvements previously made.
Well done to all involved.

The continued impact of Covid 19

In 2022 the ongoing impact of the Covid 19 pandemic continued to affect the teams involved in the QI project. The teams continued to sustain the changes implemented throughout the project ,to help improve patient outcomes. 18 teams continued to make best efforts to collect the data . All time metrics collected showed improvement's, were sustained

18

Hospitals

In 2022, the QI Collaborative incorporated 18 hospitals around the country.

4168

FAST + Patients

4168 FAST patient journeys were documented as part of the QI project in 2022.

484

Thrombectomies

In 2022, 484 patients underwent emergency thrombectomy.

Door to Decision 39 mins

Median time from door to decision for treatment for all FAST+ patients was 39mins (n2963)

Decisions Recorded n2963

2963 patients had the time of decision regarding their suitability for thrombectomy recorded in 2022.

Door to CT 28 mins

The median time from arrival at hospital to CT Brain was 28mins (n 3405).

Door to CTA 39 mins

The median time from arrival at hospital to CT Angiography was 39 mins (n 2963).

For more information please contact The National Thrombectomy Service

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Special mention must be made of the stroke CNS and ANPs around the country who have lead roles in rolling out the QI process in their hospitals and gathering the large volume of data which gives us a clear vision of the acute stroke pathway in their hospitals.

We acknowledge the hard work and dedication involved in data collection at time of referral or acute admission.

NTS team in Beaumont Hospital

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Stroke CNS', Thrombectomy Co-Ordinator, Data Administrator and all the radiology/stroke registrars, radiology nurses and radiographers.

Great efforts were made to ensure accuracy and analysis of the data to the best of our ability. If any further information is required, please do not hesitate to contact any of the NTS team.

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