Getting it right for thrombectomy-setting up a successful service
SSNF Annual Conference
David Williams
Department of Geriatric and Stroke Medicine, RCSI and Beaumont Hospital
Dublin
LEADING CAUSES OF YLLS TO PREMATURE DEATH, 1990 AND 2013, AND PERCENT CHANGE, 1990-2013

- Communicable, maternal, neonatal, and nutritional diseases
- Non-communicable diseases
- Injuries

<table>
<thead>
<tr>
<th>1990 ranking</th>
<th>2013 ranking</th>
<th>% change 1990-2013</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ischemic heart disease</td>
<td>Ischemic heart disease</td>
<td>-57%</td>
</tr>
<tr>
<td>Cerebrovascular disease</td>
<td>Lung cancer</td>
<td>-12%</td>
</tr>
<tr>
<td>Lung cancer</td>
<td>Cerebrovascular disease</td>
<td>-48%</td>
</tr>
<tr>
<td>COPD</td>
<td>Self-harm</td>
<td>-5%</td>
</tr>
<tr>
<td>Lower respiratory infect</td>
<td>COPD</td>
<td>-44%</td>
</tr>
<tr>
<td>Road injuries</td>
<td>Colorectal cancer</td>
<td>-22%</td>
</tr>
<tr>
<td>Colorectal cancer</td>
<td>Lower respiratory infect</td>
<td>-42%</td>
</tr>
<tr>
<td>Congenital anomalies</td>
<td>Alzheimer disease</td>
<td>20%</td>
</tr>
<tr>
<td>Self-harm</td>
<td>Breast cancer</td>
<td>-20%</td>
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<tr>
<td>Breast cancer</td>
<td>Congenital anomalies</td>
<td>-43%</td>
</tr>
<tr>
<td>Alzheimer disease</td>
<td>Road injuries</td>
<td>-64%</td>
</tr>
</tbody>
</table>

YLLs are years of life lost due to premature mortality.

Rankings are based on YLLs per 100,000, all ages, not age-standardized.
Stroke Mortality
The Demographic Transition
Figure 2: Discharges from hospital with stroke; age and sex adjusted discharge rates per 100,000 population.
Stroke Chain of Survival

1. Rapid Detection Of Stroke Early Warnings
2. Rapid Paramedic Pre-Hospital Care
3. Rapid Transport And Pre-Alert
4. Rapid Hospital Diagnosis And Treatment
5. Rehab Surgery Tertiary
Advances in Stroke Care

Oxford Textbook of Medicine, 1983

“There is probably little that medical treatment can do to alter the immediate prognosis of stroke. Both fibrinolytic drugs and anticoagulation increase the risk of intracranial bleeding and should usually not be used.”

Research advances

1993  Evidence for Stroke Unit benefits
1994  Carotid Endarterectomy
1997  Aspirin to prevent early recurrent stroke
2003  Alteplase licensed for treatment acute ischaemic stroke, NICE recommended 2007
2004  Outpatient therapy services
2005  Early supported discharge services
2007  Hemicraniectomy for malignant MCA infarction
2009  More protection for patients with atrial fibrillation
2015  ?
Curiously, the paper that changed Geoff Donnan’s practice is the very same one that changed Gord Gubitz’s practice. Maybe this is because both subspecialize in stroke, and because for stroke doctors to come rushing into hospital to give a treatment that might actually work has come as something of a culture shock. Charles Warlow, 2002
Benefits of tissue Plasminogen Activator (tPA) treatment: time is brain

“The typical patient loses 1.9 million neurons each minute in which stroke is untreated”
Relationship of stroke onset to start of treatment with excellent functional outcome

Odds of a favourable outcome drop off by a factor of two in each 90-min period.

Saver J, Levine S, Lancet 375;1667
The German Model

The Future of Emergency Neurology
<table>
<thead>
<tr>
<th></th>
<th>MSU Group</th>
<th>Control Group</th>
<th>P Value</th>
<th>Difference (95%CI)</th>
</tr>
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<tbody>
<tr>
<td><strong>Alarm to therapy Decision (min)</strong></td>
<td>35(31-39)</td>
<td>76(63-94)</td>
<td>&lt;0.0001</td>
<td>41(36-48)</td>
</tr>
<tr>
<td><strong>Symptom onset to therapy decision (min)</strong></td>
<td>56(43-103)</td>
<td>104(80-156)</td>
<td>&lt;0.0001</td>
<td>43(30-58)</td>
</tr>
<tr>
<td><strong>IV tPA rate</strong></td>
<td>12(23%)</td>
<td>8(17%)</td>
<td>0.3</td>
<td></td>
</tr>
<tr>
<td><strong>Alarm to end of CT (min)</strong></td>
<td>34(30-38)</td>
<td>71(62-87)</td>
<td>&lt;0.0001</td>
<td>38(33-43)</td>
</tr>
<tr>
<td><strong>Symptom onset to end of CT (min)</strong></td>
<td>56(43-103)</td>
<td>97(74-156)</td>
<td>&lt;0.0001</td>
<td>39(26-52)</td>
</tr>
</tbody>
</table>

Clot Extraction
A Patient’s Story
ESCAPE
Endovascular treatment for Small Core and Anterior circulation Proximal occlusion with Emphasis on minimizing CT to recanalization times

John Thornton\textsuperscript{1}, David Williams\textsuperscript{1,2} on behalf of the ESCAPE Trial Investigators

Beaumont Hospital\textsuperscript{1}, RCSI\textsuperscript{2}

Principal Investigators:
Michael D Hill
Mayank Goyal
Andrew M Demchuk

ESCAPE Concept

Question: “Do I take this patient for endovascular treatment (thrombectomy)?”

1. Sequential patient randomization
2. Fast and simple imaging paradigm
3. Quick workflow – parallel processing
4. Effective technology & technique to get TICI 2b/3 reperfusion

Methods

- 22 centres in Canada (11), US (6), Korea (3), UK (1), Ireland (1)
- tPA given when patient eligible (no waiting for tPA response)
- Imaging must have shown: small core, proximal intracranial artery occlusion, moderate-good collaterals using CT, mCTA (use of MRI discouraged)
- Intensive quality improvement program with personalized site visits

ESCAPE Recruitment Dublin Site

34 Patients recruited in Ireland

ESCAPE Outcomes

MEDICAL TREATMENT
(No endovascular treatment)

29% Positive Outcome
52% Disability
19% Death

ENDOVASCULAR TREATMENT
(With medical treatment)

53% Positive Outcome
37% Disability
10% Death

Randomized Assessment of Rapid Endovascular Treatment of Ischemic Stroke

ABSTRACT

OBJECTIVES

To determine whether rapid treatment with a single pass through the arterial circulation improves the outcome in patients with acute ischemic stroke caused by a proximal arterial occlusion who present within 6 hours after symptom onset. The primary outcome was the modified Rankin scale score at 90 days, compared with the baseline neurological function at time of symptom onset.

METHODS

We randomly assigned eligible patients to either standard treatment (intravenous administration of tissue plasminogen activator within 4.5 hours after symptom onset) or the study treatment (single pass through the arterial circulation with mechanical thrombectomy within 6 hours after symptom onset). The primary outcome was the modified Rankin scale score at 90 days, compared with the baseline neurological function at time of symptom onset. The treatment effect was measured with odds ratios expressed as a common odds ratio, adjusted for preprotocol variables that were found to influence the likelihood that the treatment to be studied had an effect on outcome.

RESULTS

We included 194 patients in the trial. In the standard treatment group, 45.4% of patients had a modified Rankin scale score of 0 to 2 at 90 days, compared with 53.8% in the study treatment group. The absolute risk difference was 8.4% (95% CI, 0.3 to 16.5), and the number needed to treat was 12 (95% CI, 5 to 25). The difference between the two groups was statistically significant (P = 0.04).

CONCLUSIONS

The study treatment was associated with a lower risk of death or dependency, regardless of the site of the occlusion. The results suggest that this treatment may be a promising approach for patients with acute ischemic stroke who present within 6 hours after symptom onset.

Endovascular Therapy for Ischemic Stroke with Perfusion-Imaging Selection

ABSTRACT

OBJECTIVES

To determine whether endovascular therapy for ischemic stroke in patients with acute ischemic stroke caused by a proximal arterial occlusion who present within 6 hours after symptom onset can improve the outcome in patients with acute ischemic stroke caused by a proximal arterial occlusion who present within 6 hours after symptom onset. The primary outcome was the modified Rankin scale score at 90 days, compared with the baseline neurological function at time of symptom onset. The treatment effect was measured with odds ratios expressed as a common odds ratio, adjusted for preprotocol variables that were found to influence the likelihood that the treatment to be studied had an effect on outcome.

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<table>
<thead>
<tr>
<th>Study Characteristics</th>
<th>MR CLEAN</th>
<th>EXTEND IA</th>
<th>ESCAPE</th>
<th>SWIFT-PRIME</th>
<th>REVASCAT</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Sample Size</strong></td>
<td>500</td>
<td>70 (100 Planned)</td>
<td>315 (500 planned)</td>
<td>196 (833 estimated)</td>
<td>206 (690 planned)</td>
</tr>
<tr>
<td><strong>Study Characteristics</strong></td>
<td>Endovascular treatment vs best medical mgt, +/- IV tPA</td>
<td>Mechanical clot retrieval after IV tPA vs IV tPA</td>
<td>Mechanical Thrombectomy +/- IVtPA vs best medical Mgt +/- tPA</td>
<td>IV tPA + mechanical clot retrieval vs IV tPA</td>
<td>Mechanical thrombectomy + best medical mgt vs best medical Mgt</td>
</tr>
<tr>
<td><strong>OTT</strong></td>
<td>6hrs</td>
<td>6hrs</td>
<td>12hrs</td>
<td>6hrs</td>
<td>8hrs</td>
</tr>
<tr>
<td><strong>Primary Outcome</strong></td>
<td>Significant shift towards more favourable mRS (OR 1.67, 95% CI 1.21-2.3)</td>
<td>Higher Median Perfusion (100% vs 37%, p&lt;0.001) Early Neurological improvement (80% vs 37%, p&lt;0.001)</td>
<td>Odds of improvement in mRS score by 1 point (OR 3.2, 95% CI 2.0-4.7)</td>
<td>Significant shift in mRS scores towards lower scores in intervention group (p=0.0002)</td>
<td>Odds for improvement by 1 point in mRS at 90d were significantly improved in the intervention group (OR=1.7, 95% CI 1.05-2.8)</td>
</tr>
<tr>
<td><strong>Safety</strong></td>
<td>No difference in mean number of serious adverse events</td>
<td>No significant difference between groups in any of the safety outcomes (death, symptomatic ICH or parenchymal haematoma)</td>
<td>Lower risk of death (adj RR=0.5, 95%CI 0.3-0.8) or malignant stroke (adj RR=0.3, 95% CI 0.1-0.8) lower in intervention group with no increase in risk of symptomatic ICH (adj RR=1.2, 95% CI 0.3-4.6) in intervention group</td>
<td>No increased risk of serious adverse events, including symptomatic ICH, parenchymal haematoma and SAH with intervention.</td>
<td>At 90days, the rates of death (18.4% vs 15.5%) and symptomatic ICH (1.9% vs 1.9%) were similar between groups.</td>
</tr>
<tr>
<td><strong>NNT</strong></td>
<td>7.4</td>
<td>3.2</td>
<td>4</td>
<td>4</td>
<td>6.5</td>
</tr>
</tbody>
</table>
NNT in context

- RCTs: relatively large treatment effect
- Compares favourably with:
  - Other stroke therapies
  - Established coronary interventions
Further Options for Acute Stroke Management

• Increase the time window for treatment
• Better Patient Selection for acute treatment
• Neuroprotection
• Better Systems of Care
• Acute treatment of TIA/Minor Stroke
A New DAWN

Thrombectomy 6 to 24 Hours after Stroke with a Mismatch between Deficit and Infarct


ABSTRACT

BACKGROUND
The effect of endovascular thrombectomy that is performed more than 6 hours after the onset of ischemic stroke is uncertain. Patients with a clinical deficit that is disproportionately severe relative to the infarct volume may benefit from late thrombectomy.

METHODS
We enrolled patients with occlusion of the intracranial internal carotid artery or proximal middle cerebral artery who had last been known to be well 6 to 24 hours earlier and who had a mismatch between the severity of the clinical deficit and the infarct volume, with mismatch criteria defined according to age (80 years or 2/3 years). Patients were randomly assigned to thrombectomy plus standard care (the thrombectomy group) or to standard care alone (the control group). The coprimary end points were the mean score for disability on the utility-weighted modified Rankin scale (which ranges from 0 [death] to 10 [symptoms or disability]) and the rate of functional independence (a score of 0, 1, or 2 on the modified Rankin scale, which ranges from 0 to 6, with higher scores indicating more severe disability) at 90 days.

RESULTS
A total of 206 patients were enrolled; 107 were assigned to the thrombectomy group and 99 to the control group. At 31 months, enrollment in the trial was stopped because of the results of a prespecified interim analysis. The mean score on the utility-weighted modified Rankin scale at 90 days was 5.5 in the thrombectomy group as compared with 3.4 in the control group (adjusted difference, 2.1 points; 95% credible interval, 1.1 to 3.0; posterior probability of superiority, 0.999), and the rate of functional independence at 90 days was 24% in the thrombectomy group as compared with 13% in the control group (adjusted difference, 10 percentage points; 95% credible interval, 24 to 44; posterior probability of superiority, 0.999). The rate of symptomatic intracranial hemorrhage did not differ significantly between the two groups (6% in the thrombectomy group and 3% in the control group, P=0.908), nor did 90-day mortality (23% and 18%, respectively; P=0.168).

CONCLUSIONS

mRS at 90 days was 5.5 in the thrombectomy group compared with 3.4 in the control group

Rate of functional independence at 90 days was 49% in the thrombectomy group compared with 13% in the control group

Rate of SICH and mortality did not differ between both groups
NHS thrombectomy plan needs more doctors, say stroke experts

Anne Gulland

Stroke experts have warned that not enough doctors are trained to carry out mechanical thrombectomy, after NHS England announced that the procedure will be performed on all patients who have had strokes within six hours.

NHS England said that the procedure, which involves removing clots directly from the brain using a catheter, would be introduced at 24 specialist neurovascular centres throughout the country from the summer, eventually treating around 8,000 patients a year.

The Royal College of Physicians first recommended mechanical thrombectomy for patients with acute ischaemic stroke in guidelines published last year. A systematic review and meta-analysis in The BMJ found that the procedure, if performed within six to eight hours of a stroke, leads to a reduced risk of death or disability.

Mark Barrow, associate director of the Royal College of Physicians’ stroke programme, said that the plans were “very welcome indeed”. He added: “There remain substantial challenges to its implementation, including the ability of the doctors required to perform the procedure, which is not enough in the UK.”

“What we urgently need now is for NHS England to take the lead and invest in the additional capacity of doctors and centres estimated 8,000 [people] to receive this treatment in coming years.”

NHS England confirmed that there were currently 19,370 doctors working in acute internal medicine in England, with at least 700 working in the neurovascular centres.

NHS England also announced that the departments of health in England, Wales and Northern Ireland would work together to support the development of the six-hour window for mechanical thrombectomy, which is expected to have a “major impact”. The service will be rolled out in eight stages by April 2018.

Clinical Commissioning Policy Proposition: Mechanical thrombectomy for acute ischaemic stroke

Mechanical thrombectomy services: can the UK meet the challenge?

Andrew Clifton

In this issue, Werring et al1 have set out the evidence, patient selection and criteria for one of the most effective new treatments in stroke medicine, a ‘visibly reduced risk of death or disability from mechanical thrombectomy. These are key aspects of the UK’s National Institute for Health and Care Excellence (NICE) (February 2014) and the Royal College of Physicians of London (October 2013) guidance, but these are also key challenges. The service will be delivered to the patient safely and effectively, with the involvement of doctors, nurses, radiographers and other staff in the neurovascular centres.

The challenge will be to deliver the service to one patient safely and effectively. It will need to be a major undertaking to provide the additional doctors, nurses, radiographers and other staff to be involved in the neurovascular centres for the six-hour window. The service will also need to be coordinated across the different hospitals where the patients are treated.

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‘Mothership’ vs ‘Drip and Ship’
Drip ‘N Ship Versus Direct to Thrombectomy Centre Conditional Probability Modelling In Ireland

Jessalyn K. Holodinsky, MSc, Alka B. Patel, MGIS PhD, John Thornton, MB FFR RCSI, Noreen Kamal, PhD, Lauren R. Jewett, BSc, Peter J. Kelly, MD MS, Sean Murphy, MD, Ronan Collins, MD, Thomas Walsh, MB BCh, Simon Cronin, MB PhD, Sarah Power, MB PhD, Paul Brennan MRCPI FRCR FFRRCSI MSc, Alan O’Hare MB BCh BAO. MRCPI, MSc, FFRI(RCSI), Dominick J H McCabe PhD, FRCPI, Barry Moynihan, MD, Seamus Looby, MRCPI FFR RCSI, Gerald Wyse, MB BCh BAO MRCPI FRR RCSI, Joan McCormack, RGN MSc, Paul Marsden, BSc, Joseph Harbison, MD, Michael D. Hill, MD MSc, David Williams, MB PhD
Background

- Endovascular therapy has revolutionized ischemic stroke care
- EVT centers tend to be located in urban areas so quick access isn’t available for all patients
- For patients outside EVT centre catchment areas there are two transport options
  - Drip ‘n ship (solid line)
  - Mothership (dashed line)

Objective

• To apply a previously published conditional probability modelling framework to a defined geographic area in order to predict the best transport option for patients with known large vessel occlusion
Results: Real Treatment Times

**DTN:** actual hospital median, ranges from 52 – 137 mins (Irish National Stroke Register)

**DIDO:** DTN + 60 mins (Irish National Stroke Register and Beaumont Hospital Thrombectomy Registry)

**DTP mothership:** 100 mins
**DTP drip and ship:** 10 mins (Beaumont Hospital Thrombectomy Registry)
Results: Real Treatment Times

- Why are there isolated regions where mothership is the best option?
- In the drip and ship model patients are transported first to their nearest thrombolysis centre.
- In some cases this involves travel in the opposite direction from the thrombectomy centre.
- This “doubling back” never produces the greatest probability of good outcome.
Results: What if the Thrombectomy Centre was faster?

**DTN:** actual hospital median (ranges from 52 – 137 mins)

**DIDO:** DTN + 60 mins

**DTP mothership:** 60 mins

**DTP drip and ship:** 10 mins
Results: What if the Thrombolysis Centre was faster?

**DTN:** 30 mins

**DIDO:** DTN + 60 mins

**DTP mothership:** 100 mins

**DTP drip and ship:** 10 mins
Results: What if the Transfer System was faster?

**DTN:** actual hospital median (ranges from 52 – 137 mins)

**DIDO:** DTN + 30 mins

**DTP mothership:** 100 mins

**DTP drip and ship:** 10 mins
Results: What if all systems were faster?

- **DTN**: 30 mins
- **DIDO**: DTN + 30 mins
- **DTP mothership**: 60 mins
- **DTP drip and ship**: 10 mins
Conclusions

- Conditional probability modelling can be used in a defined geographic area to predict the best transport decisions for patients
- Modelling transport is sensitive to treatment times both at the thrombolysis centre and the thrombectomy centre
- However, other factors such as economics, staffing, and other resources need to be considered as well
No Difference in median onset-CT and CT-Phone times

CT-arrival time (121(IQR 108-134)min for ‘D+D’ vs 181(157-219)min for ‘D+S’; P<0.001)

Time difference between the groups increased to more than 2hrs for median CT-Angio times (median 123(IQR 93-147)min vs 252 (228-275)min;P<0.001)
Conclusions

• Time intervals for the ’D+D group’ were not inferior to those of the ’D+S group’.

• Moreover, under certain conditions, the ’drip-and-drive’ concept might even be superior.
‘Mothership’ vs ‘Drip and Ship’
‘Drip and Drive’
National Thrombectomy Service

• 2018
  – Beaumont Hospital Dublin (331)
    263 Thrombectomies
    68 referred but not treated
  – Cork University Hospital (69)
    54 Thrombectomies
    15 referred but not treated
2018 Patient Outcomes

90-Day mRS

![mRS Bar Chart]

22% 17% 7% 15% 12% 7% 20%
## Increasing Referral Rate

<table>
<thead>
<tr>
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<th>2017</th>
<th>2018</th>
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<tr>
<td>Procedures</td>
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</tr>
<tr>
<td>Beaumont Hospital</td>
<td>247</td>
<td>263</td>
</tr>
<tr>
<td>Cork University Hospital</td>
<td>31</td>
<td>54</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Transferred but unsuitable</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Beaumont Hospital</td>
<td>34</td>
<td>68</td>
</tr>
<tr>
<td>Cork University Hospital</td>
<td>2</td>
<td>15</td>
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</tbody>
</table>
Health technology assessment of a national emergency endovascular service for mechanical thrombectomy in the management of acute ischaemic stroke

25 January 2017
A health technology assessment (HTA) by HIQA recommends a national emergency service providing next generation stroke therapy be established in two hospital sites in Ireland.

### Burden of ischaemic stroke

- **Approximately 4,300 people are admitted to hospital following an acute ischaemic stroke each year.**

### Mechanical thrombectomy

- On average, 12.3% of patients hospitalised with acute ischaemic stroke receive clot-busting therapy (thrombolysis).

### If introduced

- **Each year an estimated 268 thrombectomy procedures in Ireland.**
  - 57 more patients would regain functional independence after 90 days.
  - 982 ambulance hours transferring patients.

### Five-year budget impact of a national service is estimated at:

- **€7.2 million**
  - **€3.3 million** in the first year (Estimated €1.3 million in the first year)
  - **€1.0 million** annual running costs afterwards estimated at €0.8 to €1.2 million
  - **268 patients** based on treating 268 patients each year.
Save The Brain Campaign
Beaumont Hospital, Dublin
International Recommendations

• Traditionally
  – Door to CT ASAP and within 25 minutes
  – Door to needle ASAP and within 60 minutes

• AHA Door to Needle 45 minutes

• QUICR Door to Needle 30 minutes

October 2016, Beaumont Hospital = 120 minutes
Project Background

Aim
Reduce the door to CT times for possible strokes presenting within 12 hours of onset or unknown onset to *less than 25 minutes* during normal working hours

- Restructuring of the stroke department
- New stroke consultant
- New more ambitious international door to TPA targets
- Door to CT and door to needle times a high priority for department

Method:

1. 360 degree process mapping
2. Issues log
3. Benchmarking
360 Degree Process Mapping

- Clear picture of current practice
- Identify duplicate steps
- Identify unnecessary steps
- Reorder process to improve efficiency
Issue Log

1. Stroke team not aware of stroke until after ED assessment
2. Duplicate handovers and assessments
3. Difficulty with communication between Resus and CT
4. Multiple phone calls required to assemble full team
5. Complex CT request process
   a) Full history and NIHSS usually required prior to request
   b) Multiple contacts required to transfer to CT
6. Team approach needed refinement

Benchmarking

- Target: Stroke SM campaign
- QuICR campaign Ontario
- Mater Hospital
## Action Taken

<table>
<thead>
<tr>
<th>Change</th>
<th>Result</th>
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<tbody>
<tr>
<td><strong>Early stroke team involvement</strong></td>
<td>Multiple handovers eradicated Duplicate assessments eradicated</td>
</tr>
<tr>
<td>- Patient en-route = pre alert</td>
<td></td>
</tr>
<tr>
<td>- Front door assessment</td>
<td></td>
</tr>
<tr>
<td><strong>Communication</strong></td>
<td>No delay in contact</td>
</tr>
<tr>
<td>- Direct phone line CT and Stroke</td>
<td></td>
</tr>
<tr>
<td><strong>Single alert nurse</strong></td>
<td>4 less calls made per patient</td>
</tr>
<tr>
<td>- One alert to Stroke Reg, Nurse, Porter and CT</td>
<td>CT on alert and ready for patient</td>
</tr>
<tr>
<td><strong>CT request process</strong></td>
<td>5 steps reduced to 2</td>
</tr>
<tr>
<td>- Streamline &amp; simplify</td>
<td></td>
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<tr>
<td><strong>Improve teamwork</strong></td>
<td>Teams working in parallel rather than in series</td>
</tr>
<tr>
<td>- One morning briefing together</td>
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<tr>
<td>- Assignment of roles</td>
<td></td>
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<tr>
<td><strong>Awareness &amp; education</strong></td>
<td>Improved awareness by all teams</td>
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<tr>
<td>- Pathway posters</td>
<td></td>
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<tr>
<td>- Display of charts to track progress</td>
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RESULTS – February 2017

RECORD TIME = 6 MINUTES!

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<td>October 6</td>
<td>November 6</td>
<td>December 7</td>
<td>January 16</td>
<td>February 5</td>
</tr>
<tr>
<td>120 minutes</td>
<td>35 minutes</td>
<td>71 minutes</td>
<td>21.5 minutes</td>
<td>11 minutes</td>
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DOOR TO DECISION IN UNDER 30!!
A National Quality Improvement Project for the care of Patients with Acute Ischaemic Stroke (AIS)

Despite the fact that IV Thrombolysis and Thrombectomy are now standard of care, we have not managed to achieve optimal rates of door to needle times & door to decision times throughout Ireland.

There is a gap between what we know and what we do.

Treatment within a shorter timeframe, improves patient outcomes!!

Act FAST | Time is Brain
GOAL: To provide maximum availability and efficiency in achieving recanalization, in as rapid a timeframe as possible, in all patients presenting with AIS throughout the country.
DOOR TO DECISION IN UNDER 30!

The first round of this collaborative training programme ran from Jan to Oct 2018, with 10 hospitals from across Ireland (QI1).

Round two ran from Oct – June 2019, with another 12 hospitals (QI2).

Each hospital sends a 3-4 member team, to attend the learning sessions in Dublin, supported by a local steering group.
Pre alert the hospital
Pt direct to CT
Pre order Bloods/imaging
Use of a ‘stroke box’
Administer tPA in CT – Give the Juice!
Assign duties to staff
Keep ambulance in place until decision is made
Having decision makers in place to review scans
Simulation training
Page relevant staff
Pre register pt
Keep pt on Ambulance trolley
FAST + DATA
QI2 teams...

Door to Decision 80% ↓ reduced - 8 hospitals median of under 40 mins

Door to iv tPA – 60% ↓ reduced

Door to CT – 60% ↓ reduced the time
Door to CTA – 60% ↓ reduced

459 pt data sets
Conclusion

• Endovascular thrombectomy is a safe, highly effective and cost-effective procedure that saves lives and dramatically reduces disability WHEN:
  – Patients are carefully selected by imaging to identify proximal occlusions, and exclude large core and exclude patients with absent collaterals
  – Treatment is extremely fast with target first slice
    • imaging $\rightarrow$ to groin puncture $<$ 60 min and
    • imaging $\rightarrow$ to reperfusion $<$ 90 min
  – Safe effective technology (retrievable stents) is used