Adherence to the pre-hospital stroke pathway in Greater Manchester: analysis of a large HASU dataset and development of a smartphone app to improve compliance.

Pathway dilemmas and decisions?

**PATHWAY EXCLUSIONS**

**AGE - < 16 years old**

**A** - Airway compromised following basic manoeuvres

**B** - RR - <10 >30
- SpO2 <90% post high flow O2

**C** - BP (systolic) - <90mmHg
- HR - <40bpm or >150bpm

**D** - GCS—7 or less
- Any seizure activity reported during or causing, this incident / 999 call.

**G** - BM < 4.0 mmols post treatment
Pre solution scoping

Users were asked to score their own confidence and knowledge of the GM stroke pathway using a Likert scale (1=poor/10=perfect)

<table>
<thead>
<tr>
<th></th>
<th>Paramedics (28)</th>
<th>Technicians (4)</th>
<th>All (32)</th>
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<tbody>
<tr>
<td>Median</td>
<td>7</td>
<td>4.5</td>
<td>7 (IQR 5-8)</td>
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Pre solution scoping

What are the opening/accepting times for Stepping Hill HASU service and Fairfield General HASU service?

They were given 4 options – 06:00-23:00 / 06:30-22:30 / 06:45-22:45 / 07:00-23:00

44% (14/32) correctly stated 06:45-22:45

How many exclusions does the Greater Manchester Stroke Pathway have?

3% (1/32) correctly stated 9 exclusions
Destination choice

Which hospital would be the correct destination choice for a patient presenting <4 hours onset and with FAST positive symptoms in Clayton Vale, Droylesden, M43?

They were given the 3 HASU options and asked to choose if either confident or a guess

- 19% recorded SRFT confidently
- 28% recorded SRFT as a guess
- 53% recorded the wrong HASU

This was repeated for two more postcodes with identical results.
CHC Dataset – pre-hospital assessment

- 6000+ Included cases
- Salford Royal (SRFT) arrivals only
- Sep 2015 to Feb 2017 (18 months)
- Cases brought by ambulance on the stroke pathway
- All ambulance patient report form (PRF) observations and relevant assessment notes extracted
- Ambulance record cross matched with final hospital diagnosis
- Other SRFT dataset measures recorded and cross matched including LOS, imaging used, treatment received etc......
## Compliance Results

01/09/2015-28/02/2017 (18 months)

<table>
<thead>
<tr>
<th></th>
<th>%</th>
<th>Total</th>
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<tbody>
<tr>
<td>Exclusions</td>
<td>299/3470 (8.6%)</td>
<td>299</td>
</tr>
<tr>
<td>FAST Negative</td>
<td>270/3074 (8%)</td>
<td>270</td>
</tr>
<tr>
<td>Wrong HASU</td>
<td>155/2872 (5%)</td>
<td>155</td>
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</tbody>
</table>

- SRFT attendances only
- Non SRFT catchment area patients only
- Airway compromised not measured
- Pre alert adherence not measured
- >48 hours since onset not measured

- 7 patients in Wrong HASU group repeated in FAST Negative group
- 22 patients in Wrong HASU group repeated in exclusion group
Pre Hospital Pathway Aid (PHPA) app

- Invited as a clinician to an “AHSN Mobilise the NHS hack day”
- The group included the GMSODN Coordinator, a NWAS Paramedic and a SRFT Neurologist
- Partnered and worked with a small SME developer (D2Digital)
- We named it the “Pre Hospital Pathway Aid” (PHPA) app.
PHPA app – Aims

• Reproduce the GM pre-hospital stroke pathway
• Direct to nearest open HASU or ED
• Prompt to pre-alert (< 4 h)
• Nearest hospital finder also embedded
PHPA Menu screen

Pre-hospital Pathway Aid

Stroke Pathway
Currently for operational use only in the Greater Manchester Stroke catchment area – other areas to be included at a later date.

Download Pathway  Educational Videos  Begin
Exclusions

Please select the most appropriate exclusion

Patient <16 years old

Airway compromised following basic manoeuvres

RR - <10 >30

SpO2 <90% post high oxygen

BP (systolic) - <90mmHg

HR - <40bpm or >150bpm

GCS - 7 or less

Any seizure activity reported during, or causing, this incident/999 call

BMI <4.0 mmol/L post treatment

None of these apply
Any seizure activity reported during, or causing, this incident/999 call

BM < 4.0 mmol/L post treatment

None of these apply

Onset Time

< 4 hrs  > 4 hrs but < 48 hrs  > 48 hrs
Onset Time

< 4 hrs  > 4 hrs but < 48 hrs  > 48 hrs

Is patient on anticoagulants?

Direct oral anticoagulants
Apixaban, Rivaroxaban, Dabigatran or Edoxaban

Vitamin K antagonists
Warfarin or Sinthrome

Yes  No
Stroke Pre-Alert

Please remember to:
- Stroke pre alert
- Using the ASHIC mnemonic
- Pass the patients name or NHS number & D.O.B

Salford Royal - 16.8 mi
A & E Open 24 hours  |  Hyper Acute Open 24 hours

Fairfield General Hospital - 19.7 mi
A & E Open 24 hours  |  Hyper Acute Closes in an hour
To aid borderline decisions by paramedics - The hospitals are drawn from a list which includes those within and just outside Greater Manchester borders.

- **Salford Royal** - 16.8 mi
  - A&E Open 24 hours
  - Hyper Acute Open 24 hours

- **Fairfield General Hospital** - 19.7 mi
  - A&E Open 24 hours
  - Hyper Acute Closes in an hour

- **Stepping Hill Hospital** - 29.1 mi
  - A&E Open 24 hours
  - Hyper Acute Closes in an hour
PHPA Pilot data

• Beta version trialed (clinicians volunteered to test the app).
• Phase 1 – 17th July 2017 (2 months)
• Email invite sent to 74 users
• 19 Advanced Paramedics / 55 Paramedics & Technicians
• 44 Registered & actively used the app from 74
• 1300 GM NWAS clinicians (approx. 3.38% piloting)
• Live mode used for true incidents, rather than demo
Green Hexagon = The Number diverted to the nearest appropriate hospital in relation to incident location

Total = 32/74 (43%)
“The app comes across as a brilliant, simple and effective idea that reduces the need for paramedics to carry around pieces of paper and allows them to instantly decide on the most appropriate place of care”

“Having experienced a stroke myself, I vividly remember the paramedic on that day trying to work out and discuss where he should take me. This app would have made that decision clearer and faster ”

Ann Bamford, stroke patient and chair of the (GMSODN) patient and carer group.
Summary

• Our study suggests that pathway breaches occur regularly and that the PHPA app may improve pathway compliance.
• A February launch date has been agreed with NWAS for all GM pre-hospital vehicles & clinicians to have access.
• Measure the assessment of impact on launch.
• Prospectively evaluate the effect on pathway breaches.
• React collaboratively with NWAS and stakeholders when evaluating the impact.
Thank you for listening

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