A New Era for Stroke: Where Next?

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The Medical Director’s Pet Hates

- People who just ask for more money
- The phrase ‘postcode lottery’
- The Daily Mail
- Single-issue pressure groups with no appreciation of the unprecedented financial and efficiency challenges facing the English NHS
- Er...
- ...that’s it
What are the priorities for the NHS?

The three ‘gaps’:
1. The finance and efficiency gap
2. And the other two
3.
Reduction in 30-day mortality from acute stroke 1998-2014

50%
Reduction in hospital length of stay for acute stroke 2001-2014

49%
Decline in institutionalisation for acute stroke 2004-2013

46%
NHS Continuing Healthcare

- £2.5bn annual cost (2.3% NHS budget)
- 60,000 current claimants
- 30% of institutional placements are attributable to stroke
- 5-year healthcare cost per institutionalised person with stroke: £100K at 2008 prices (OXVASC data)
- Projected to increase to £3.2bn by 2022 (Nuffield Trust)
Using SSNAP data to estimate the costs of stroke

Bray et al, 2016
Thrombectomy: the game changer

Stent retriever (Solitaire)

**A** Overall

<table>
<thead>
<tr>
<th>Control population (n=645)</th>
<th>5.0</th>
<th>7.9</th>
<th>13.6</th>
<th>16.4</th>
<th>24.7</th>
<th>13.5</th>
<th>18.9</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intervention population (n=633)</td>
<td>10.0</td>
<td>16.9</td>
<td>19.1</td>
<td>16.9</td>
<td>15.6</td>
<td>6.2</td>
<td>15.3</td>
</tr>
</tbody>
</table>

**B** Ineligible for alteplase

<table>
<thead>
<tr>
<th>Control population (n=80)</th>
<th>3.6</th>
<th>6.2</th>
<th>12.5</th>
<th>8.7</th>
<th>31.2</th>
<th>15.0</th>
<th>22.5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intervention population (n=108)</td>
<td>10.2</td>
<td>15.7</td>
<td>17.6</td>
<td>18.5</td>
<td>7.4</td>
<td>7.4</td>
<td>23.1</td>
</tr>
</tbody>
</table>

**Received alteplase**

<table>
<thead>
<tr>
<th>Control population (n=565)</th>
<th>5.1</th>
<th>8.1</th>
<th>13.8</th>
<th>17.5</th>
<th>23.7</th>
<th>13.3</th>
<th>18.4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intervention population (n=525)</td>
<td>9.9</td>
<td>17.1</td>
<td>19.4</td>
<td>16.6</td>
<td>17.3</td>
<td>5.9</td>
<td>13.7</td>
</tr>
</tbody>
</table>

43%
But will thrombectomy be cost-effective?

- Cost per Quality-Adjusted Life Year (QALY)
  - Alteplase within 4.5 hours £4451
  - Mechanical thrombectomy £6954-7061
  - Primary PCI for STEMI £9241
  - Mechanical thrombectomy in the US £10,885
  - Average for the NHS £13,000
  - Cancer Drugs Fund £68,326
Time to treatment effect in MR CLEAN

B Effect of time on achieving mRS score of 0-2: all participants

$P = .04$ for interaction

Fransen et al, JAMA 2016
What are your chances of getting admitted to a stroke unit within 4 hours?

84%

22%

206 out of 211 CCGs (5 removed due to small numbers)

NHS Atlas of Variation 2015
Stroke unit access – our very own postcode lottery

A (90+)
B (80-89)
C (70-79)
D (60-69)
E (<60)
Insufficient records
Source: SSNAP Apr-June 2014 (Team Centred)

Source: SSNAP Jan-Mar 2015 (Team Centred)
Acute hospitals with at least one vacant stroke consultant post

40% of acute stroke sites now have at least one vacancy, up from 25% in two years

Source: SSNAP Acute Organisational Audit 2016
What’s so Special about Stroke?

• STEMI: NNT for primary PCI v. thrombolysis for one additional patient to survive – 23-44
• Stroke: NNT for thrombectomy up to 6 hours after onset for one additional patient to survive free of disability – 3 -7

• STEMI: National Infarct Angioplasty Project → £9M/yr for 5 years to implement PPCI to save 237 lives/year at £9241 per QALY
• Stroke?
Decline in institutionalisation for acute stroke 2004-2013
Despite a steady fall in age-specific incidence, stroke remains the third largest cause of DALYs.

<table>
<thead>
<tr>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>Ischaemic heart disease</td>
<td>1</td>
<td>2</td>
<td>Ischaemic heart disease</td>
<td>1.1</td>
<td>10% (3 to 15%)</td>
<td>2.1</td>
<td>10% (3 to 15%)</td>
</tr>
<tr>
<td>2</td>
<td>Low back and neck pain</td>
<td>2</td>
<td>2</td>
<td>Low back and neck pain</td>
<td>1.9</td>
<td>-20% (-24 to -15%)</td>
<td>2.9</td>
<td>-20% (-24 to -15%)</td>
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<tr>
<td>3</td>
<td>Cerebrovascular disease</td>
<td>3</td>
<td>3</td>
<td>Cerebrovascular disease</td>
<td>3.9</td>
<td>-12% (-17 to -7%)</td>
<td>3.9</td>
<td>-12% (-17 to -7%)</td>
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<tr>
<td>4</td>
<td>COPD</td>
<td>4</td>
<td>4</td>
<td>COPD</td>
<td>4.3</td>
<td>1% (-5 to 8%)</td>
<td>4.3</td>
<td>1% (-5 to 8%)</td>
</tr>
<tr>
<td>5</td>
<td>Lung cancer</td>
<td>5</td>
<td>5</td>
<td>Lung cancer</td>
<td>4.9</td>
<td>0% (-7 to 7%)</td>
<td>4.9</td>
<td>0% (-7 to 7%)</td>
</tr>
<tr>
<td>6</td>
<td>Falls</td>
<td>6</td>
<td>6</td>
<td>Falls</td>
<td>6.7</td>
<td>11% (2 to 20%)</td>
<td>6.7</td>
<td>11% (2 to 20%)</td>
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<tr>
<td>7</td>
<td>Alzheimer's disease</td>
<td>7</td>
<td>7</td>
<td>Alzheimer's disease</td>
<td>6.8</td>
<td>9% (5 to 12%)</td>
<td>6.8</td>
<td>9% (5 to 12%)</td>
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<tr>
<td>8</td>
<td>Sense organ diseases</td>
<td>8</td>
<td>8</td>
<td>Sense organ diseases</td>
<td>8.8</td>
<td>9% (4 to 12%)</td>
<td>8.8</td>
<td>9% (4 to 12%)</td>
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<tr>
<td>9</td>
<td>Skin diseases</td>
<td>9</td>
<td>9</td>
<td>Skin diseases</td>
<td>9.9</td>
<td>-11% (-17 to -4%)</td>
<td>9.9</td>
<td>-11% (-17 to -4%)</td>
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<tr>
<td>10</td>
<td>Depressive disorders</td>
<td>10</td>
<td>10</td>
<td>Depressive disorders</td>
<td>9.3</td>
<td>-1% (-5 to 5%)</td>
<td>9.3</td>
<td>-1% (-5 to 5%)</td>
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<tr>
<td>11</td>
<td>Lower respiratory infections</td>
<td>11</td>
<td>11</td>
<td>Lower respiratory infections</td>
<td>10.6</td>
<td>16% (7 to 27%)</td>
<td>10.6</td>
<td>16% (7 to 27%)</td>
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<tr>
<td>12</td>
<td>Colorectal cancer</td>
<td>12</td>
<td>12</td>
<td>Colorectal cancer</td>
<td>12.5</td>
<td>-15% (-20 to -5%)</td>
<td>12.5</td>
<td>-15% (-20 to -5%)</td>
</tr>
<tr>
<td>13</td>
<td>Breast cancer</td>
<td>13</td>
<td>13</td>
<td>Breast cancer</td>
<td>14.0</td>
<td>8% (4 to 10%)</td>
<td>14.0</td>
<td>8% (4 to 10%)</td>
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<tr>
<td>14</td>
<td>Chronic kidney disease</td>
<td>14</td>
<td>14</td>
<td>Chronic kidney disease</td>
<td>15.1</td>
<td>0% (-6 to 6%)</td>
<td>15.1</td>
<td>0% (-6 to 6%)</td>
</tr>
<tr>
<td>15</td>
<td>Migraine</td>
<td>15</td>
<td>15</td>
<td>Migraine</td>
<td>15.5</td>
<td>-6% (8 to 31%)</td>
<td>15.5</td>
<td>-6% (8 to 31%)</td>
</tr>
<tr>
<td>16</td>
<td>Other musculoskeletal</td>
<td>16</td>
<td>16</td>
<td>Other musculoskeletal</td>
<td>16.4</td>
<td>10% (6 to 13%)</td>
<td>16.4</td>
<td>10% (6 to 13%)</td>
</tr>
<tr>
<td>17</td>
<td>Anxiety disorders</td>
<td>17</td>
<td>17</td>
<td>Anxiety disorders</td>
<td>16.8</td>
<td>7% (4 to 8%)</td>
<td>16.8</td>
<td>7% (4 to 8%)</td>
</tr>
<tr>
<td>18</td>
<td>Breast cancer</td>
<td>18</td>
<td>18</td>
<td>Breast cancer</td>
<td>17.0</td>
<td>-11% (-17 to 0%)</td>
<td>17.0</td>
<td>-11% (-17 to 0%)</td>
</tr>
<tr>
<td>19</td>
<td>Other cardiovascular</td>
<td>19</td>
<td>19</td>
<td>Other cardiovascular</td>
<td>18.2</td>
<td>-5% (-9 to 2%)</td>
<td>18.2</td>
<td>-5% (-9 to 2%)</td>
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<tr>
<td>20</td>
<td>Drug use disorders</td>
<td>20</td>
<td>20</td>
<td>Drug use disorders</td>
<td>20.2</td>
<td>-6% (-5 to 6%)</td>
<td>20.2</td>
<td>-6% (-5 to 6%)</td>
</tr>
<tr>
<td>21</td>
<td>Neonatal preterm birth</td>
<td>21</td>
<td>21</td>
<td>Neonatal preterm birth</td>
<td>20.5</td>
<td>7% (-2 to 13%)</td>
<td>20.5</td>
<td>7% (-2 to 13%)</td>
</tr>
<tr>
<td>22</td>
<td>Oral disorders</td>
<td>22</td>
<td>22</td>
<td>Oral disorders</td>
<td>20.8</td>
<td>11% (8 to 15%)</td>
<td>20.8</td>
<td>11% (8 to 15%)</td>
</tr>
<tr>
<td>23</td>
<td>Iron-deficiency anaemia</td>
<td>23</td>
<td>23</td>
<td>Iron-deficiency anaemia</td>
<td>21.5</td>
<td>-3% (-15 to 14%)</td>
<td>21.5</td>
<td>-3% (-15 to 14%)</td>
</tr>
<tr>
<td>24</td>
<td>Self-harm</td>
<td>24</td>
<td>24</td>
<td>Self-harm</td>
<td>24.5</td>
<td>-12% (-23 to -3%)</td>
<td>24.5</td>
<td>-12% (-23 to -3%)</td>
</tr>
<tr>
<td>25</td>
<td>Drug use disorders</td>
<td>25</td>
<td>25</td>
<td>Drug use disorders</td>
<td>25.5</td>
<td>3% (-3 to 5%)</td>
<td>25.5</td>
<td>3% (-3 to 5%)</td>
</tr>
</tbody>
</table>

*Figure 4: The 25 leading GBD level 3 causes of disability-adjusted life years (DALYs) in England, both sexes combined, 1990, 2005, and 2013, with age-standardised median percent change.

Ranks are based on the number of DALYs. 95% UIs for mean rank are from 1000 draws of DALYs. UI=uncertainty interval. COPD=chronic obstructive pulmonary disease.*

Age-Specific Incidence, Outcome, Cost, and Projected Future Burden of Atrial Fibrillation–Related Embolic Vascular Events
A Population-Based Study
Gabriel S.C. Yiin, Dominic P.J. Howard, Nicola L.M. Paul, Linxin Li, Ramon Luengo-Fernandez, Linda M. Bull, Sarah J.V. Welch, Sergei A. Gutnikov, Ziyah Mehta and Peter M. Rothwell and on behalf of the Oxford Vascular Study
Circulation, 2014
What are the NHS priorities for stroke?

How can stroke bridge the three gaps:

1. The Health and Wellbeing gap?
2. The Care and Quality gap?
3. The Finance and Efficiency gap?