

<b>Institution: University of Central Lancashire</b>
<b>Unit of Assessment: 3 Allied Health Professions, Dentistry, Nursing and Pharmacy</b>
<b>Title of case study: Reducing death and disability from stroke by raising awareness and improving emergency and hyperacute care.</b>
<p><b>1. Summary of the impact</b> (indicative maximum 100 words)</p> <p>After the onset of stroke symptoms, much disability and death can be prevented by ensuring immediate access to effective specialist assessment and treatment. Our work on improving pathways of care in acute stroke has included research on raising public awareness of stroke, so that people seek emergency medical advice promptly, and research and development on emergency medical services' skills and practice. The findings of this research have led to impacts on clinical care and health services practice via inclusion in national and international clinical guidelines and training, improvements in the recognition of stroke, and reduced pre-hospital delays and time to emergency department diagnosis. Such improvements are known to reduce death and disability from stroke.</p>
<p><b>2. Underpinning research</b> (indicative maximum 500 words)</p> <p><b>Public awareness – patients at higher risk of stroke (2006-2011)</b></p> <p>We undertook a qualitative study of people's experiences of transient ischaemic attack (Gibson and Watkins, 2011) and an integrative review using PRISMA methodology of public knowledge of stroke symptoms, risk factors and action to take when stroke is suspected (Jones et al., 2010). These identified that public knowledge of stroke recognition and prevention was poor, and that there was a mismatch between the public's stated intentions to contact the EMS at the onset of stroke symptoms and the actions of people at symptom onset. This led to a mixed-methods study on patients' experiences of and decisions about seeking help after stroke and TIA. Information from this study was synthesised with the review results and used to inform a focus group that discussed the best way to inform a stroke information leaflet. This leaflet was tested in patients attending a TIA clinic. This work contributed to the development of training materials in the ESCORTT programme (see below).</p> <p><b>RESPONSE programme (2006- 2009)</b></p> <p>In parallel to our work on public awareness of stroke, we performed a series of systematic reviews on the acute physiological effects of stroke in order to identify whether there was evidence to support changes in paramedic practice (Jones et al., 2007). These reviews underpinned the development of on-line training for paramedics (Jones et al., 2011) and were used to write an addendum on pre-hospital management for the National Clinical Guideline for Stroke (2<sup>nd</sup> edition), in partnership with the Royal College of Physicians Clinical Effectiveness Unit, British Paramedic Association, College of Emergency Medicine, and The Stroke Association.</p> <p><b>Emergency Stroke Calls, Obtaining Rapid Telephone Triage (ESCORTT) (2006-2011)</b></p> <p>This research programme built on our earlier work on public awareness and emergency services response to stroke symptoms. The overall aim of the programme was to facilitate recognition of stroke by frontline health services staff. It consisted of 8 phases including exploration of interaction between the public and the emergency medical services (EMS) during emergency calls for stroke (Jones et al, 2011a; Jones et al., 2011b), development of stroke-specific training for Emergency Medical Dispatchers, and evaluation of the effectiveness of the training package via an interrupted time series analysis (Watkins et al., 2013). The work was conducted in partnership with several NHS organisations: North West Ambulance Service, NHS Direct, and three NHS Foundation Trusts.</p>

**Impact case study (REF3b)****3. References to the research** (indicative maximum of six references)

1. Gibson JME, Watkins CL. People's experiences of the impact of transient ischaemic attack and its consequences: qualitative study. *Journal of Advanced Nursing*. 2011;doi:10.1111/j.1365-2648.2011.05849
2. Jones SP, Leathley MJ, Mcadam JJ, Watkins CL. Physiological monitoring in acute stroke: a literature review. *Journal of Advanced Nursing*. 2007;60(6):577–594.
3. Jones SP, Leathley MJ, Jenkinson M, Watkins C. Stroke knowledge and awareness: an integrative review of the evidence. *Age Ageing*. 2010;39:11-22.
4. Jones SP, Dickinson HA, Ford GA, Gibson JME, Leathley MJ, McAdam JJ, Quinn T, Watkins CL on behalf of the ESCORTT group. Callers' experiences of making emergency calls at the onset of acute stroke: a qualitative study. *Emergency Medical Journal*. 2011a;doi:10.1136/emj.2010.108563.
5. Jones SP, Carter B, Ford GA, Gibson JME, Leathley MJ, McAdam JJ, O'Donnell M, Punekar S, Quinn T, Watkins CL on behalf of the ESCORTT group. The identification of acute stroke: An analysis of emergency calls. *International Journal of Stroke*. 2011b;doi: 10.1111/j.1747-4949.2011.00749.
6. Watkins CL, Leathley MJ, Jones SP, Ford GA, Quinn T, Sutton CJ, On behalf of the Emergency Stroke Calls: Obtaining Rapid Telephone Triage (ESCORTT) Group. Training Emergency Services' Dispatchers to recognise stroke: An interrupted time-series analysis. *BMC Health Services Research*. 2013;13:38: doi:10.1186/1472-6963-13-318.

**Funding that has supported the research**

Rapid Emergency Stroke Pathways: Organised Systems and Education (RESPONSE). Cumbria and Lancashire Workforce Development Confederation.

Applicants: Watkins C, Jones S, Leathley M. Awarded £145,030. 2003. Awarded: October 2003; Start: 01/11/2003; End: 30/04/2008

Emergency Stroke Calls: Obtaining Rapid Telephone Triage (ESCORTT). NIHR. Applicants: Watkins C, Ford G, Cooke M, Durham S, Fairhurst R, Quinn T, Rose M, Mitchell D, Leathley M, Morris S, Jones S, Mackway-Jones K. Awarded £1,064,124. 2007. Awarded: August 2007; Start: 01/09/2007; End: 31/12/2011

Senior Investigator Award. NIHR. Applicant: Watkins CL. Awarded total £60,000. 2009-2013. Awarded: 27 Feb 2009; Start: 01/04/2009; End: 31/03/2013.

**4. Details of the impact** (indicative maximum 750 words)**Public awareness – patients at higher risk of stroke**

The integrative review was cited in: the 4<sup>th</sup> edition of the National Clinical Guideline for Stroke (Intercollegiate Stroke Working Party, 2012); the Australian National Guidelines for Stroke Management (National Stroke Foundation, 2010); and the New Zealand Clinical Guidelines for Stroke Management (Stroke Foundation of New Zealand, 2010).

The review also identified that people from minority ethnic groups were less likely to have knowledge of stroke risk factors and symptoms, yet often had a higher risk of stroke. To address this lack of knowledge in the local South East Asian community in north west England, we conducted a collaborative project. This involved training people from those communities in interview techniques in order to enable interviews in the participants' first language. A DVD was then developed with local service users from South Asian communities. This was a short 'soap opera' style film in Hindi with English subtitles about someone having a stroke, and included information on risk factors, action to take when stroke is suspected, acute care, rehabilitation and secondary prevention. Making and refining the DVD involved the co-operation of 20 local community groups. Subsequent evaluation indicated a significant increase in knowledge of stroke in the short and medium term, and an associated positive increase in health behaviours.

**Impact case study (REF3b)**

Further testing in different populations is underway. This work has been cited as an example of good practice in Patient and Public Engagement by NHS Improvement. The DVD has been widely disseminated including free distribution of 7000 copies with Asian Image newspaper.

**RESPONSE programme**

Our systematic review (Jones et al., 2007) identified that routine oxygen supplementation via facemask was not based on evidence, yet this was common practice. This led to consultation with the Joint Royal Colleges Ambulance Liaison Committee and subsequent amendment to their guideline for pre-hospital care in suspected stroke. Other systematic reviews undertaken to underpin the RESPONSE course were incorporated in pre-hospital guidelines which were initially an addendum to, now incorporated in, the National Clinical Guideline for Stroke. The work of setting up the pre-hospital guideline group was initiated by Watkins and Jones and the team further collaborated with the Royal College of Paramedics in updating the pre-hospital guidelines for the 4<sup>th</sup> edition of National Clinical Guideline for Stroke.

The RESPONSE online training has been undertaken by over 3000 health care staff worldwide, including Australia, Jamaica and Canada. An evaluation of the course conducted with UK participants found that participants were either very satisfied or satisfied with it and reported an increased knowledge in the management of acute stroke. They especially welcomed its usability, interactive nature, and flexibility (Jones et al., 2011c). The RESPONSE programme has been further developed to provide training for staff working in A&E, care homes, and primary care.

**Emergency Stroke Calls: Obtaining Rapid Telephone Triage (ESCORTT)**

The impact of the stroke-specific training package which was based on earlier phases of this programme (Jones et al., 2011a; Jones et al 2011b) on the recognition of stroke by Emergency Medical Dispatchers has been evaluated over 8 months with 488 patients, using an interrupted time series analysis (Watkins et al., 2013). The percentages of those with final diagnosis of stroke who were correctly dispatched by EMS were 63.0% in the pre-implementation phase, rising to 87.5% during implementation, and remaining higher than baseline at 79.7% post-implementation. The training package also improved aspects of pre-hospital delay, amounting to a mean overall reduction of more than 10 minutes from time of call to emergency department diagnosis. It has been estimated that a typical patient loses 1.9 million neurons each minute in which stroke is untreated (Saver, 2006) and the benefits of rapid diagnosis of stroke on improving both mortality and morbidity are well-recognised.

Our work in this field contributed to a successful application for NIHR Research for Patient Benefit project funding on the development and evaluation of training in a telemedicine system for acute stroke in A&E: Acute Stroke Telemedicine: Utility, Training and Evaluation (ASTUTE). In the ASTUTE programme we are exploring how standardisation of procedures and training can facilitate the effective use of telemedicine in stroke in order to benefit patient care. The research programme was developed in collaboration with the introduction in 2011 of a Telestroke service throughout Cumbria and Lancashire across nine NHS Trusts. A Standardised Telemedicine Toolkit has been developed (<http://www.astute-telestroke.org.uk>) to support individuals or organisations that want to set up a telemedicine system.

**5. Sources to corroborate the impact** (indicative maximum of 10 references)**Public awareness – patients at higher risk of stroke**

Citation in: Intercollegiate Stroke Working Party. National Clinical Guideline for Stroke 4<sup>th</sup> edition 2012. London; Royal College of Physicians. Section 3.17 Improving public awareness of stroke. <http://www.rcplondon.ac.uk/sites/default/files/national-clinical-guidelines-for-stroke-fourth-edition.pdf> .Section 3.17 p35.

Citation in: National Stroke Foundation. Clinical Guidelines for Stroke Management 2010. Melbourne, Australia, National Stroke Foundation. Section 4 Acute stroke management. <http://www.nhmrc.gov.au/files/nhmrc/publications/attachments/cp126.pdf>

**Impact case study (REF3b)**

Citation in: Stroke Foundation of New Zealand and New Zealand Guidelines Group. Clinical Guidelines for Stroke Management 2010. Wellington: Stroke Foundation of New Zealand. Section 2.1 Stroke recognition and pre-hospital care.  
<http://www.stroke.org.nz/resources/NZClinicalGuidelinesStrokeManagement2010ActiveContents.pdf>

*Reference supporting these sections*

Jones SP, Leathley MJ, Jenkinson M, Watkins C. Stroke knowledge and awareness: an integrative review of the evidence. Age Ageing. 2010;39:11-22.

South Asian DVD project:

<http://www.improvement.nhs.uk/stroke/CommunityStrokeResource/CSRPatientandPublicEngagementPPE/CSRPEexamples/tabid/240/Default.aspx>  
[http://www.asianimage.co.uk/news/9377143.Free\\_DVD\\_with\\_Asian\\_Image/](http://www.asianimage.co.uk/news/9377143.Free_DVD_with_Asian_Image/)

**RESPONSE programme**

National Pre-hospital Guidelines Group. The recognition and emergency management of suspected stroke and TIA: Guidelines Supplement. 2007.

RESPONSE on-line training (2005) was cited in the National Stroke Strategy (2007) as a marker of success for Quality Marker 18. <http://ukfst.org/courses/50/>

Citation in: Canadian Stroke Strategy. Canadian Best Practice Recommendations for Stroke Care, Update 2010. Section 4.0 Acute stroke management.

*Reference supporting this section*

Jones SP, Leathley MJ, McAdam JJ, et al. Physiological monitoring in acute stroke: a literature review. J Adv Nurs 2007;60:577-94.

The RESPONSE initiative was a finalist in NHS Northwest Innovation Awards for 2007.

**Emergency Stroke Calls, Obtaining Rapid Telephone Triage (ESCORTT)**

The Standardised Telemedicine Toolkit is available at: <http://www.astute-telestroke.org.uk>