

<b>Institution: University of Winchester</b>		
<b>Unit of Assessment: C24 Sport and Exercise Sciences, Leisure and Tourism</b>		
<b>Title of case study: Exercise participation following stroke or transient ischaemic attack: Informing the implementation and delivery of the HELP Hampshire Stroke Clinic</b>		
<b>Period when the underpinning research was undertaken: 2013-2017</b>		
<b>Details of staff conducting the underpinning research from the submitting unit:</b>		
<b>Name(s):</b> Dr James Faulkner	<b>Role(s) (e.g. job title):</b> Reader in Sport & Exercise Physiology	<b>Period(s) employed by submitting HEI:</b> 2015 to the present
<b>Period when the claimed impact occurred: 2019 to the present</b>		
<b>Is this case study continued from a case study submitted in 2014? N</b>		
<b>1. Summary of the impact</b> (indicative maximum 100 words)		
<p>Evaluations that have demonstrated improvements in outcomes following post-stroke exercise programmes have guided the development of the HELP (Health Enhancing Lifestyle Programme) Hampshire Stroke Clinic, a community-based collaboration between the University of Winchester, Hampshire Hospitals NHS Foundation Trust (HHFT), and Hobbs Rehabilitation (independent neuro-rehabilitation service). The clinic shifts focus from General Practice identifying and recruiting patients to exercise referral schemes to HHFT and their acute stroke unit, Transient Ischaemic Attack (TIA) clinic and Early Supportive Discharge (ESD). The evidence highlighted in this case study illustrates how our research has impacted on the stroke care pathway of HHFT. Such impact has national relevance as this is similar to other NHS trusts.</p>		
<b>2. Underpinning research</b> (indicative maximum 500 words)		
<p>In the UK, there are over 100,000 strokes each year, and over 1.2 million stroke survivors. Once a stroke patient has been discharged from the care of the NHS, there are limited opportunities for people to engage in accessible and affordable lifestyle behaviour change initiatives in the community, despite robust evidence supporting the benefits of post-stroke exercise participation, as demonstrated by <b>Faulkner</b> and colleagues <b>(3.1-3.4)</b>.</p> <p>Faulkner has undertaken randomized controlled trials, in collaboration with local healthcare providers, that have demonstrated: 1) the short- and long-term benefit of stroke/TIA patients engaging in exercise programmes soon after diagnosis; 2) the economic importance of secondary stroke prevention programmes; and 3) optimal blood pressure assessment procedures for stroke survivors.</p>		
<b>1. Research evidence regarding the benefit of exercise soon after stroke/TIA</b>		
<p>Faulkner and colleagues have provided evidence that 8- to 12-weeks of at least twice weekly aerobic and/or resistance training can improve cardiovascular disease risk profile <b>(3.1-3.2)</b> and quality of life <b>(3.3)</b> when engaging stroke/TIA patients in exercise programmes within seven days of diagnosis. Faulkner's research showed large reductions in blood pressure (BP) <b>(3.1-3.2)</b>, and improvements in blood lipid profile and measures of body composition <b>(3.1)</b>. The benefits reported immediately following the intervention were maintained up to 12-months after the exercise programme <b>(3.1)</b>. These individuals were also shown to have fewer hospital admissions and strokes, and reduced risk of total mortality, when compared to those individuals who did not engage in such a programme, within three and a half years of stroke diagnosis <b>(3.4)</b>.</p>		

**2. Research into economic impact of secondary stroke prevention programmes**

Faulkner demonstrated the economic benefit of secondary prevention exercise and education programmes on stroke/TIA patient hospital costs (3.4). The study was the first to demonstrate that over a three-and-a-half-year follow-up period, the costs associated with stroke/TIA patient hospital admissions were 141% higher in those individuals who did not participate in an exercise and education programme soon after stroke/TIA diagnosis.

**3. Winchester's research into optimal BP assessment procedures**

Faulkner and colleagues assessed the short- and longer-term changes in BP with stroke patients lying down and in a fasted-state (3.1-3.2). However, BP is measured in differing postures and fasting states within clinical settings (hospitals, GP practices) according to a variety of environmental and situational factors. Mitchelmore (PhD student, University of Winchester; 2015-2019), **Faulkner** and **Jobson** demonstrated that when measuring BP in stroke patients and an older, healthy population group, it should be assessed in a fasted state, regardless of posture (seated/supine), to optimise the accuracy and reproducibility of collected data (3.5, 3.6). Accordingly, the HELP Hampshire Stroke Clinic assesses patients at screening and follow-up assessments in a fasted state.

**3. References to the research** (indicative maximum of six references)

- 3.1 **Faulkner**, J., Lambrick, D., Woolley, B., Stoner, L., Wong, L., McGonigal, G. (2014). The long-term effect of exercise on vascular risk factors and aerobic fitness in those with TIA; A randomized controlled trial. *Journal of Hypertension*, 32, 2064-70. doi:[10.1097/HJH.000000000000283](https://doi.org/10.1097/HJH.000000000000283).
- 3.2 **Faulkner**, J., Tzeng, Y.C., Lambrick, D., Woolley, B., Allan, P.D., O'Donnell, T., Lanford, J., Wong, L., Stoner, L. (2017a). A randomized controlled trial to assess the central hemodynamic response to exercise in patients with transient ischaemic attack and minor stroke. *Journal of Human Hypertension*, 31, 172-177. doi: [10.1038/jhh.2016.72](https://doi.org/10.1038/jhh.2016.72)
- 3.3 **Faulkner**, J., McGonigal, G., Woolley, B., Stoner, L., Wong, L., Lambrick, D. (2015). A randomized controlled trial to assess the psychosocial effects of early exercise engagement in patients diagnosed with transient ischaemic attack and mild, non-disabling stroke. *Clinical Rehabilitation*, 29, 783-94. doi: [10.1177/0269215514555729](https://doi.org/10.1177/0269215514555729)
- 3.4 **Faulkner**, J., Stoner, L., Lanford, J., Jolliffe, E., Mitchelmore, A., Lambrick, D. (2017b). Long-term effect of participation in an early exercise and education program on clinical outcomes and cost implications, in patients with TIA and minor, non-disabling stroke. *Translational Stroke Research*, 8, 220-227. doi: [10.1007/s12975-016-0510-6](https://doi.org/10.1007/s12975-016-0510-6)
- 3.5 Mitchelmore, A., Stoner, L., Lambrick, D., Sykes, L., Eglinton, C., **Jobson, S., Faulkner, J.** (2018) Oscillometric central blood pressure and central systolic loading in stroke patients: Short-term reproducibility and effects of posture and fasting state. *PLoS ONE* 13(11): e0206329. doi: [10.1371/journal.pone.0206329](https://doi.org/10.1371/journal.pone.0206329)
- 3.6 Mitchelmore, A., Stoner, L., Lambrick, D., **Jobson, S., Faulkner, J.** (2018). Reliability of oscillometric central blood pressure and central systolic loading in individuals over 50 years: effects of posture and fasting, *Atherosclerosis*, 238, 79-85. <https://doi.org/10.1016/j.atherosclerosis.2017.12.030>

**4. Details of the impact** (indicative maximum 750 words)

The research of **Faulkner** and colleagues (3.1 to 3.6) has underpinned the creation of the **HELP (Health Enhancing Lifestyle Programme) Hampshire Stroke Clinic**; an accessible, low-cost service to community-dwelling individuals living with stroke (5.1) which has had a substantial impact on: i) people, by improving health outcomes for stroke patients and facilitating greater opportunities for volunteers, ii) reconfiguring the pathway for stroke referrals within the NHS (HHFT), and iii) practice services (e.g., Hobbs rehabilitation processes and research focus).

**Impact on patient beneficiaries**

The HELP Hampshire Stroke Clinic is recognised as one of the top 100 University programmes that are 'saving lives and keeping us healthy' (5.2). The HELP Hampshire Stroke Clinic collects robust data on stroke outcomes. Substantial improvements in BP have been evidenced, with attendees to the clinic experiencing meaningful reductions in BP from when they start (146/82 mmHg) to when they complete the programme (135/79 mmHg) (5.3). This is impactful when considering that a BP  $\leq$ 140/85 mmHg is associated with up to a 41% reduction in experiencing future strokes (Weiss et al., 2017, doi:10.7326/M16-1754). Engagement with the exercise programme has resulted in attendees showing improvements in their functional abilities (e.g., balance, walking), psychosocial outcomes (anxiety, depression, confidence) and quality of life have also been reported (5.3). In support of these positive impacts, the Stroke Association have reported that:

*'The programme is having a real impact on the lives of our service users and has both physical and psychosocial health outcomes. They feel that the support from ward to the clinic is 'seamless' and for service users whose strokes were a few years ago, this new programme has given a renewed boost to their recovery and a feeling that they can continue to make improvements.'* (5.4)

The impact of this clinic on the quality of life of service users and their families has also been significant, as evidenced through patient testimonials. For example, this patient highlighted numerous positive impacts:

*'When I first started attending, I was barely out of my wheelchair. Afraid to walk, as I was not at all confident to walk. But now with exercises for core muscles, co-ordination, agility, balance, strength, making us more aware, I'm able to walk with my own two legs with a lot more confidence'* (5.5)

**Impact on referral configuration**

Prior to the commencement of the HELP Hampshire Stroke Clinic, the referral of stroke patients to Winchester City Council's Active Lifestyle's Exercise Referral Scheme, primarily from GP practices, was limited, with approximately 20 patients being referred annually to community, leisure-centre based exercise programmes. The HELP Hampshire Stroke Clinic has instigated significant service reconfiguration for the referral of patients to community stroke rehabilitation programmes by developing a new pathway of secondary care via HHFT, and in particular the Hyper-acute stroke unit, TIA clinic and ESD team (5.6, 5.7). Although the Clinic also receives referrals from GP practices, with 16 GP practices referring patients to the clinic in the first year of the Clinic (March 2019 to March 2020), the programme quadrupled (n = 80 patients) the number of annual stroke survivors engaging in community exercise. As of June 2020, and due to COVID-19, the HELP Hampshire Stroke Clinic commenced the delivery of virtual online, practitioner led exercise classes. Accordingly, individuals newly diagnosed with stroke during COVID-19 are also able to access the services of the HELP Hampshire Stroke Clinic.

**Impact on voluntary sector**

Based on the success of recruiting local stroke patients to the HELP Hampshire Stroke Clinic, the Stroke Association approached the University of Winchester to create a new stroke support group (5.4). Accordingly, in November 2019, the HELP Hampshire Stroke Clinic and Stroke Association started to provide additional opportunities for community-dwelling stroke survivors (approx. 20-30 people) to help improve patients' communication, rebuild confidence and independence, and help people rebuild their life after stroke. Students (Sports Science, Physiotherapy) from the University of Winchester and other Higher Education Institutions (Solent University; University of Portsmouth) are afforded opportunities to enhance their learning whilst supporting the HELP Hampshire Stroke Clinic. Their involvement provides an opportunity to foster the application of knowledge and aids in developing and applying their learned skills, whilst facilitating confidence-building and an opportunity to improve communication skills when dealing with members of the public (5.8). In addition to enhancing learning opportunities, this link is shaping the views of future generation allied health practitioners on after stroke care. Impacting upon the Physiological Society and Guild

HE report on 'Sport & Exercise Science Education: Impact on the UK Economy' (5.9), the HELP Hampshire Stroke Clinic was one of only three (of 29) University case studies that was deemed to provide 'benefits to the public purse'.

#### **Impact on independent neuro-physiotherapy provider**

Hobbs Rehabilitation is the largest independent rehabilitation provider in the UK. The HELP Hampshire Stroke Clinic has influenced Hobbs' activity by: i) facilitating opportunities for them to deliver group-based exercise classes in the community as a part of a collaborative programme, and ii) encouraging them to engage in research activities to help further their knowledge, understanding and application of physical therapy for patients with neurological conditions (5.10).

#### **5. Sources to corroborate the impact** (indicative maximum of 10 references)

5.1 HELP Hampshire website; [www.helphamshire.co.uk](http://www.helphamshire.co.uk)

5.2 <https://madeatuni.org.uk/university-winchester/helping-stroke-survivors-through-exercise>

5.3 HELP Hampshire annual report; [Report | HELP HAMPSHIRE](#)

5.4 Stroke Association Support Co-ordinator testimonial

5.5 Stroke patient testimonials; [Testimonials | HELP HAMPSHIRE](#)

5.6 Hampshire Hospitals NHS Foundation Trust testimonial; Stroke Consultant, Hampshire Hospitals NHS Foundation Trust, Twyford Ward (Stroke Unit)

5.7 Winchester City Council Active Lifestyle Programme Letter of Support

5.8 Higher Education Student Testimonials

5.9 [https://static.physoc.org/app/uploads/2019/05/30115957/SES\\_Key-findings.pdf](https://static.physoc.org/app/uploads/2019/05/30115957/SES_Key-findings.pdf)

5.10 Hobbs Rehabilitation testimonial; senior representative, Hobbs Rehabilitation, Letter of Support.