Institution: Keele University

Unit of Assessment: 2

Title of case study: Optimising clinical outcomes and cost-effectiveness of primary care for patients with back pain

1. Summary of the impact (indicative maximum 100 words)

Our research has produced a paradigm shift in the primary care management for back pain, by expanding traditional diagnostic approaches to attending to physical and psychosocial factors shown to influence future outcome ('prognosis'). We have developed screening tools (freely available, widely accessed, translated and adopted), to distinguish groups at low or high risk of long-term disability, and developed primary care interventions tailored to these groups. Through improved clinical outcomes and cost-effectiveness, we have changed back care at national and international levels, evidenced by inclusion in official guidelines, into training of health professionals, adoption by spine and pain services, and active engagement of health care commissioners, clinicians and educators.

2. Underpinning research (indicative maximum 500 words)

The Global Burden of Disease Project highlighted back pain as the leading cause of years lived with disability. This is strong justification for the focus of our research on the impact, long-term outcomes, and optimal management of back pain, strongly supported by patient and public involvement from our dedicated Research User Group. This research has generated over 190 peer-reviewed publications since 1994. Based on large primary care-based cohort studies funded by Arthritis Research UK, Wellcome Trust and National Institute of Health Research (NIHR), we have improved current understanding of the impact and prognosis of back pain. The research outputs overturned the commonly held belief that back pain patients have a good prognosis and highlighted the multidimensional consequences of pain. Croft (Keele University, Professor of Primary Care Epidemiology, 1995-present) conducted one of the first population-based studies of back pain using linked medical record data, and demonstrated that 75% of patients still experience pain and disability one year after consultation in primary care, with psychological and social factors predicting poor long-term outcome (references 1,2). Using novel statistical approaches to analysing longitudinal data, Dunn (Wellcome Trust Reader in Epidemiology, Keele University, 2008-2014) identified distinct back pain trajectories characterised by increasing psychosocial consequences and risk of poor long-term outcome (reference 3). These insights instigated a shift in the classification of back pain from a focus on current pain duration and diagnosis to a prognostic definition based on assessment of key physical and psychosocial factors to estimate risk of poor outcome, and initiated the development and validation of a brief screening tool for use in clinical practice (STarTBack Tool, reference 4). This research has been pivotal in the development of new approaches to the management of back pain.

In a National Lottery funded randomised trial Hay (Professor in Community Rheumatology, Keele University, 1994-present) demonstrated that appropriately trained physiotherapists can adopt and incorporate psychosocial approaches in the management of back pain, and that such a pain management approach can be delivered in fewer sessions and with equal effectiveness compared to a standard package of physiotherapy (reference 5). Key findings from this trial and our prognostic studies underpinned a new programme of research funded by Arthritis Research UK, the Health Foundation and the NIHR, developing and testing a model of stratified care based on patients' prognosis. In this model, patients at low risk of poor outcome are supported to self-manage, while those at medium and high risk access treatment that target their key physical and psychosocial obstacles to recovery. We provided robust evidence that stratified care is superior to best current care in a large randomised trial (STarTBack trial, reference 6) where subgrouping using the STarTBack screening tool and matched treatments improved patients' clinical and work outcomes with clear cost-savings for the NHS and society. A subsequent impact study (Foster, NIHR Professor of Musculoskeletal Health in Primary Care, Keele University, 2012-17) confirmed

that stratified care can be implemented in primary care, leading to improvements in patient outcomes including disability and days lost from work at similar healthcare costs.

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

[Reference 1]. Croft PR, Macfarlane GJ, Papageorgiou AC, Thomas E, Silman AJ. Outcome of low back pain in general practice: a prospective study. *BMJ* 1998;316(7141):1356-9. (604 citations Google Scholar)

[Reference 2]. Thomas E, Silman AJ, Croft PR, Papageorgiou AC, Jayson MI, Macfarlane G. Predicting who develops chronic low back pain in primary care: a prospective study. BMJ 1999;318(7199):1662-7. (428 citations Google Scholar)

[Reference 3]. Dunn KM, Jordan K, Croft PR. Characterising the course of low back pain: a latent class analysis. *Am J Epidemiol* 2006;163(8):754-61. (119 citations Google Scholar)

[Reference 4]. Hill JC, Dunn KM, Lewis M, Mullis R, Main CJ, Foster NE, Hay EM. A primary care back pain screening tool: identifying patient subgroups for initial treatment. Arthritis Rheum 2008;59(5):632-41. DOI:10.1002/art.23563 (117 citations Google Scholar)

[Reference 5]. Hay EM, Mullis R, Lewis M, Vohora K, Main CJ, Watson P, Dziedzic KS, Sim J, Minns Lowe C, Croft PR. Comparison of physical treatment versus a brief pain management programme for back pain in primary care: a randomised clinical trial in physiotherapy practice. Lancet 2005;365(9476):2023-30. (129 citations Google Scholar)

[Reference 6]. Hill JC, Whitehurst DG, Lewis M, Bryan S, Dunn KM, Foster NE, Konstantinou K, Main CJ, Mason E, Somerville S, Sowden G, Vohora K, Hay EM. Comparison of stratified primary care management for low back pain with current best practice (STarT Back): a randomised controlled trial. Lancet 2011;378(9802):1560-71. DOI: 10.1016/S0140-6736(11)60937-9. (110 citations Google Scholar)

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

Key impact: Incorporating prognostic information in clinical care for back pain

The prognostic information identified by our research, particularly information about the course of back pain and key predictors of poor outcome, has been incorporated into Evidence Based Medicine resources: BMJ Best Practice, e-Guidelines; UpToDate; and NICE Clinical Knowledge Summaries in the UK [1] and internationally.[e.g. 2] Our novel approach to bringing together key predictors of outcome in a brief prognostic screening tool (STarTBack Tool) has been adopted by at least 85 clinical services across the world to classify and inform patients regarding the likely course of their symptoms.[e.g. 3,4] We have developed a website (www.keele.ac.uk/sbst/) including free and open access to the tool, and information to encourage implementation into clinical practice. The website has been accessed by 30,000 unique visitors since inception in 2009. Research groups in Denmark, Sweden and the USA are collaborating with our team to test its generalizability to other patient populations and healthcare settings, and its use in children with back pain. Use of the tool to identify high-risk patients has been recommended by key professional groups; the Royal College of General Practitioners (RCGP Online MSK Module) [5]; Department of Health National Spinal Taskforce [6]; British Pain Society (2013); and other national guidelines**.**

Key impact: Implementing psychosocial approaches in primary care for back pain

We pioneered the application of psychosocial approaches to chronic pain management, on the basis of our findings that psychosocial factors are predictors and consequences of chronic pain. These approaches were developed by specialist teams of psychologists and physiotherapists, and applied more broadly to primary care. Our back pain trial (Hay et al. 2005) showed that our training and mentoring programme enable primary care physiotherapists to successfully deliver psychologically informed physiotherapy, encouraging patients to alter unhelpful attitudes and pain-related fears, increasing activity, and supporting self-management and return-to-work. By integrating these research findings into routine health services, we have ensured more immediate

improvements in the care provided for back pain patients. Our staff have led and collaborated on the development of back pain and chronic pain management ('IMPACT') services, which continue to offer enhanced approaches to pain management. In 2013 the IMPACT service won the national Care Integration Award for pain management. Since 2007 we have trained over 230 healthcare professionals from the UK, Denmark, Australia, Germany, USA and Ireland to adopt and deliver psychologically informed physiotherapy, and have developed a cascade training model for wider dissemination. Healthcare services [e.g. 7] now incorporate such models of care. This pioneering work contributed substantially to the Centre's receipt of the Queen's Anniversary Prize (2009).

Key impact: Providing a novel cost-effective model of stratified care for back pain

In a randomised trial and impact study, we combined our expertise in prognostic stratification with matched interventions to produce a new model of stratified care for back pain. This demonstrated improved patient outcomes and reduced work loss compared to current best care, together with cost savings for the NHS. Public and professional awareness of the benefits of stratified care has been increased via radio and patient magazines (BBC Health News Sept 2011, Arthritis Today October 2011) and professional forums (Frontline CSP Sept 2011, RCGP Conference 2012, RCGP on line training). We held workshops with leading UK musculoskeletal clinicians in November 2009 and June 2012, plus a conference in April 2012 with >120 delegates, including representatives from the Department of Health, professional bodies and key charities, leading to adoption of the StarTBack approach in at least 23 healthcare organisations. Change in healthcare delivery and patient outcome has been achieved through our team working with expert groups to revise the Department of Health's Any Qualified Provider documentation (March 2012) and the Map of Medicine care pathway for back pain (April 2012)[8], which provide evidence-based guidance and clinical decision support at the point of care, and enable commissioners to develop efficient and effective development of new services. Through the Keele Primary Care Musculoskeletal Research Consortium, considered a national exemplar model for academic-healthcare collaboration, we have facilitated implementation of the stratified care model within community physiotherapy services in Cheshire and Staffordshire. It has been incorporated into commissioning plans for Vale Royal, South Cheshire, North Staffordshire and Stoke Clinical Commissioning Groups, as part of General Practice QP plans, service providers QiPP initiatives and commissioning CQUIN targets [9], which allows for the new approach to become sustainable and serve as good practice model for the wider NHS. Multiple services in the UK have changed their clinical pathways to implement stratified care [e.g. 4,7]. Internationally, prognostic stratification in patients with back pain has been advocated on government websites, recommended in international guidelines [e.g. 10], and several healthcare organisations are adopting stratified care for back pain (e.g. Fairview Healthcare, Minnesota and Intermountain Healthcare, Utah).

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

[Source 1]: National Institute for Health and Clinical Excellence (NICE) Clinical Knowledge Summaries (CKS). Back Pain – low (without radiculopathy). November 2009. http://cks.nice.org.uk/back-pain-low-without-radiculopathy (Last accessed 17-Oct-13)

[Source 2]: Therapeutic Guidelines: Rheumatology (revised October 2010, Key References – non-specific low back pain). In: eTG complete [Internet]. Melbourne: Therapeutic Guidelines Limited (Last accessed 17-Oct-13) http://www.tg.org.au/etg_demo/desktop/tgc/rhg/rheumatology,_version_2.htm

[Source 3]: STarTBack Tool implemented in Region of Southern Denmark (STarT skema in Danish): since June 2012. Available at http://www.regionsyddanmark.dk/wm370018 (Last accessed 17-Oct-13)

[Source 4]: Sheffield back pain services: http://www.sheffieldbackpain.com/professional-resources/resources/keele-start. (Last accessed 17-Oct-13)

[Source 5]: Royal College of General Practitioners (RCGP) Musculoskeletal online module and 2012 Curriculum for Care of People with for Musculoskeletal Problems, page 8 (http://www.rcgp.org.uk/gp-training-and-exams/gp-curriculum-overview.aspx) (Last

accessed 17-Oct-13)

[Source 6]: National Spinal Taskforce January 2013: Commissioning Spinal Services: Getting the service back on track: a guide for commissioners of spinal services (page 15, 16). Available at http://www.nationalspinaltaskforce.co.uk/ (Last accessed 17-Oct-13)

[Source 7]: Back Rehabilitation Programme in Department of Physiotherapy, Ipswich Hospital. Available at http://www2.ipswichhospital.net/microsites/physiotherapy/gp_backrehab.asp (Last accessed 17-Oct-13)

[Source 8]: Map of Medicine: Low back and radicular pain: a pathway for care developed by the British Pain Society. Lee J, Gupta S, Price C, Baranowski AP. Br J Anaesthesia 2013; 111: 112-120. http://healthguides.mapofmedicine.com/choices/map/low_back_and_radicular_pain1.html (Last accessed 17-Oct-13)

[Source 9]: CQUIN and AHP Musculoskeletal Care Toolkit, March 2012. Quality and Productivity (QP) indicator by the North Staffordshire CCG, used in 36 practices covering a population of 220,000. Available at http://www.networks.nhs.uk/nhs-networks/ahp-networks/ahp-qipp-toolkits (Last accessed 17-Oct-13)

[Source 10]:Goertz M, Thorson D, Bonsell J, Bonte B, Campbell R, Haake B, Johnson K, Kramer C, Mueller B, Peterson S, Setterlund L, Timming R. Adult acute and subacute low back pain. Bloomington (MN): Institute for Clinical Systems Improvement (ICSI); Nov 2012. https://www.icsi.org/_asset/bjvqrj/LBP.pdf (page 25-26 and Appendix E) (Last accessed 17-Oct-13)