Surgical management of rotator cuff tears: improving the evidence base

Project team: Jacqueline Murphy, Alastair Gray and the UKUFF trial team

HERC researchers have recently completed a five-year study which aimed to generate better clinical and health economic evidence for shoulder surgery to repair rotator cuff tears. The work revealed that both available techniques (open and arthroscopic surgery) offer comparable clinical benefit in terms of shoulder functionality and quality of life improvement, and are associated with similar economic outcomes for the NHS after surgery.

The rotator cuff is a group of muscles and tendons in the shoulder that control movement, and degenerative tears of the tendons are common in those aged over 50 years. These tears can be repaired surgically, using either arthroscopic (“keyhole”) techniques or traditional “open” surgery, where the joint is accessed through a larger incision in the skin. There is uncertainty around which is the best technique because reliable evidence of the comparative health and cost outcomes associated with these techniques is limited.

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There was insufficient evidence that one surgical management choice was more cost-effective than the other.

High street optometrists and age-related macular degeneration monitoring

**Project team:** Mara Violato, Helen Dakin, Sarah Wordsworth and the ECHoES trial team

Neovascular age-related macular degeneration (nAMD) is a common disorder of the ageing eye and may cause severe sight loss and blindness. After treatment with anti-VEGF therapy, patients are currently monitored regularly at the hospital eye service (HES) in case the disease reactivates, at which point further treatment is needed. Monitoring at the HES is burdensome to patients, their carers and the NHS.

The ECHoES trial was conducted jointly by the Universities of Bristol, Queen’s Belfast and Oxford, and was funded by the NIHR HTA programme (ref 11/129/195). The trial investigated whether high-street optometrists, after appropriate training, can make decisions about disease reactivation that are as accurate as those of hospital-based ophthalmologists, and whether a shared care delivery model between hospital ophthalmologists and community optometrists is cost-effective.

Forty-eight high-street optometrists with no prior experience of retina clinics and 48 ophthalmologists with prior experience were given the same short training. They were then asked to assess 42 real-life vignettes through a virtual internet-based application to establish whether the disease had reactivated or not. Their answers were compared with those of three medical retina experts, who acted as the reference standard. Resource use and cost information were then applied to these reactivation/retreatment decisions.

In the base-case analysis, the differences in mean cost per assessment (£14; £411 for community optometrists and £397 for hospital-based ophthalmologists) and the percentage of correct disease assessments (1%; 84% for optometrists and 85% for ophthalmologists) were not statistically significant. While the base-case analysis nominally favoured hospital-based ophthalmologist services, sensitivity analyses reflecting different practices across eye hospitals suggested that a shared delivery model involving monitoring by community optometrists could be cost-effective for some hospitals/regions. If delivered efficiently, shared care with community optometrists is a promising strategy to meet the challenge of a shortage of ophthalmologists in the HES.

For more information:
Cholesterol- and blood-pressure-lowering medications underused for secondary cardiovascular prevention in Europe

**Project team:** Borislava Mihaylova, Alastair Gray

HERC researchers have previously contributed to the literature on the effectiveness and cost-effectiveness of cholesterol- and blood pressure-lowering medications in a wide range of people at increased cardiovascular disease risk. However, in a recent study carried out in collaboration with Dmitrij Achelrod from the Hamburg Center for Health Economics, and David Preiss from the Nuffield Department of Population Health at the University of Oxford, we find that these drugs are still substantially underused across Europe.

The study, published in the European Journal of Preventive Cardiology, used data from a large longitudinal cohort study in middle-aged and older Europeans (the Survey of Health, Ageing and Retirement in Europe) to investigate trends in cardiovascular drug use in people at high cardiovascular risk due to previous heart attack or stroke.

While cholesterol- and blood pressure-lowering treatment has been recommended for the vast majority of these participants throughout the study period, only 40% and 60% of them, respectively, reported using these medications at study entry, and cross-sectional rates increased only moderately (odds ratios of use in 2013 vs. 2004, 1.6 and 1.5, respectively) with larger increases in higher gross national income countries.

In a further panel data analysis among people who had ever used the medications, controlling for time-invariant patient characteristics, the use of both drug classes declined over time and with increasing duration from the latest acute cardiovascular event. Those who were obese, retired, with hypercholesterolaemia, hypertension, worse self-perceived health, or, in the case of lipid-lowering medication, with diabetes, were more likely to use these medications. Conversely, “healthier” secondary prevention participants were less likely to use such drugs. We conclude that physician- and patient-centred strategies are needed to strengthen use of effective preventive interventions and improve population health.

For more information:

Improving access to malaria treatment in rural communities in Africa

**Project lead:** Borislava Mihaylova

A high burden of malaria persists in many areas of Africa, with timely access to malaria diagnosis and treatment crucial for complete recovery and avoidance of disability and mortality. Increased efforts are, however, needed to improve access to effective care in the typically rural and remote areas of increased malaria incidence. A large study, carried out in 172 villages in Burkina Faso, Nigeria, and Uganda between 2009 and 2015, investigated the feasibility of training and using Community Health Worker (CHW) volunteers to provide rapid malaria diagnosis, oral artemisinin combination therapy and rectal artesunate treatment for children in their communities. The detailed results of this study were published as a supplement in Clinical and Infectious Diseases in December 2016.

HERC Associate Professor Boby Mihaylova collaborated with Joelle Castellani (a PhD-candidate at Maastricht University), Dr Melba Gomes (World Health Organisation), other researchers from WHO and Maastricht University, and local collaborators in Burkina Faso, Nigeria, and Uganda, to evaluate the time that CHWs spent providing health care and the impact of this increased access to care in the community on private household costs. The study found that CHWs provided healthcare for an average of 60 to 80 minutes daily with the total contributed time over a year valued at US Dollars (USD) $52 in Burkina Faso, USD $295 in Nigeria and USD $141 in Uganda. Furthermore, the improved access to care in the study more than halved private household costs per illness episode in each country. Using the most recent population figures for each study district, the intervention was estimated to have saved households a total of USD $29,965, USD $254,268, and USD $303,467, respectively, in the study districts in Burkina Faso, Nigeria, and Uganda.

These results indicate that CHW-based provision of care is a feasible, effective and efficient way to improve malaria management in high burden rural communities. However, the CHWs in this study were volunteers, and it is likely that an effective reward system is needed for sustainable community care provision.

For more information:

...among people who had ever used the medications...the use of both drug classes declined over time
The introduction of orthogeriatric and nurse-led fracture liaison services was not cost-saving relative to usual care.

Cost-effectiveness of models of hip fracture care

**Project team:** José Leal, Alastair Gray

Hip fractures are a major public health problem, with high morbidity, mortality, and health and social care costs. Hip fractures usually occur as a result of a low-impact falls in individuals with underlying bone fragility due to osteoporosis. HERC researchers previously estimated that hip fractures account for £1.2 billion per year in UK primary and hospital care costs.

The recommended model of hip fracture management focuses on optimal recovery and secondary fracture prevention. However, clinical practice varies considerably across the NHS as robust evidence of effectiveness and cost-effectiveness is lacking for the different care models.

To address this uncertainty, we recently completed an economic evaluation to estimate the 'real-world' impact of different care models in the NHS in England. This was part of a larger mixed-methods project combining qualitative research with statistical and health economic analysis using large routinely collected datasets from primary and secondary care. The work was funded by the NIHR Health Services and Delivery Research Programme.

The economic evaluation utilised data from the Hospital Episode Statistics and Clinical Practice Research Database datasets, a systematic review of utility data, and a detailed evaluation of hospital hip fracture services in a UK region. A Markov model was then constructed to evaluate the lifetime costs and life expectancy of different models of care. The model structure was defined using an iterative process involving discussions with clinical experts and epidemiologists, and was supplemented by a literature review of economic models in this disease area.

We found that the introduction and/or expansion of orthogeriatric and nurse-led fracture liaison services was more effective and cost-effective than usual care, and was associated with reductions in mortality rates. However, the introduction of these services was not cost-saving relative to usual care as the benefits in terms of longevity translate into higher costs and re-fractures. We also noted the need for further research to reduce decision uncertainty, which would require clinical trials performing unbiased comparisons of the different care models.

For more information:

Reforms at the Scottish Medicines Consortium: making better decisions for cancer drugs?

**Project team:** Liz Morrell (CASMi), Sarah Wordsworth

The Scottish Medicines Consortium’s 2014 reforms aimed to increase patient access to new drugs for end-of-life and rare conditions. A key feature is the introduction of a Patient and Clinical Engagement (PACE) meeting, to identify any additional value not captured by QALY’s. With other HTA agencies interested in the effectiveness of these reforms, HERC and the Centre for the Advancement of Sustainable Medical Innovation (CASMi) have recently collaborated to evaluate the new process and its access outcomes.

We found that the greatest impact of the reforms was in cancer. Reviewing all decisions since the reforms, we identified 38 cancer drugs that were at risk of rejection under the standard process, but with the new route, had gained some level of market access. Although this is probably an overestimate, the reforms appear to have achieved their aim of funding more new drugs.

But were these drugs value for money? The PACE meeting focuses on a new drug’s additional benefits, implying that the comparator has no additional benefits that should also be given weight in the decision. This might be appropriate in some cases, but becomes problematic in areas of high innovation: last year’s new drug becomes next year’s comparator, when its unique non-QALY benefits are no longer discussed. The non-QALY benefits of the marginal displaced health are also ignored. So the PACE process risks bias in favour of “new” – a choice reflected in the name of its funding mechanism (the New Medicines Fund).

Analysis of the PACE discussions found that whilst some of the main themes are explicitly part of cost-effectiveness analysis (e.g. overall survival), some are not (e.g. effect on the family) and many are indirectly covered (e.g. severity, unmet need). Furthermore, the topics overlap with the ideas considered by NICE in 2010 for value-based pricing. It is perhaps reassuring that these preferences remain stable, and suggests that value-based pricing might need dusting off and reconsidering in order to consistently reflect these concerns in decision-making.

For more information: please contact Liz Morrell at liz.morrell@casmi.org.uk
Spotlight on DAVID JONES

I joined HERC as a Researcher in October 2016. My current work focuses on the disease and economic modelling of non-alcoholic fatty liver disease, a rapidly emerging condition associated with obesity and metabolic syndrome. I will be working primarily alongside the RADIcAL trial which is funded by the EU Horizon 2020 programme. This randomised controlled trial will explore the impact of introducing multi-parametric MRI for the diagnosis and staging of non-alcoholic fatty liver disease compared to current clinical practice across multiple centres in Europe.

My academic background is in Economics, receiving my Bachelor’s Degree in the subject from the University of York. I continued at the University, completing a Master’s Degree in Health Economics with support from a NIHR studentship. Prior to joining HERC I worked as a Health Economist Intern at The Global Fund in Geneva. My research estimated the effect of human rights interventions on the health and behaviour of marginal population groups in low and middle income countries. I also participated in a WHO conference on the development of official guidance to help countries, such as those introducing universal health care, build suitable HTA mechanisms to inform their healthcare decision making.

Despite being at HERC for a relatively short time, the centre has already provided me with excellent training opportunities and are very supportive of my development as a health economist. I am currently interested in the use of Bayesian methods for the evaluation of disease areas with limited data and knowledge of natural history, such as non-alcoholic fatty liver disease. I also remain interested in global health issues.
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