

NHS Endowment call 2022 – successful applications

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PI	Project Title and Summary
<p>Dr Anastasia Pavlova</p>	<p>Physiotherapists' views on patient handling, work-related musculoskeletal disorders and the potential role of targeted exercise in preparing for occupational demands.</p> <p>During their career, almost 70% of UK physiotherapists experience muscle, joint or bone pain that they believe is caused by their work; these are known as work-related musculoskeletal disorders (WRMSDs). In 2019/2020 WRMSDs cost the NHS approximately £400 million due to 8.9 million workdays lost through staff absence. Work activities that involve moving and handling patients have been linked with the development of WRMSDs. Physiotherapists are at risk due to handling they do during patient treatment sessions.</p> <p>Interventions to reduce WRMSDs, such as manual handling training and providing mechanical lifting aids to move patients, are not significantly reducing WRMSD rates. Evidence from interventions in nursing staff suggests that a tailored approach, involving exercise targeted at job-specific activities, may reduce WRMSDs in physiotherapists. However, developing and implementing an intervention into practice will be more successful if physiotherapists are involved in its development.</p> <p>This study will explore the views of physiotherapists surrounding WRMSDs, moving and handling of patients and the role of targeted exercise in reducing physiotherapist WRMSDs. Interviews and focus groups will be held with NHS physiotherapists in Grampian and across the UK. The results will inform future work aimed at developing a comprehensive intervention to reduce WRMSDs in physiotherapists.</p>
<p>Dr William Ball</p>	<p>Mental Health Crisis Events in Children and Young People in NHS Grampian – analysis of routinely collected data</p> <p>1 in 6 young people (aged between 6 and 19) in the UK has a mental health condition, and the frequency is increasing over time. Many young people struggle to get professional help, with females and those from deprived areas most likely to require support. When this need becomes urgent, often involving attendance at an emergency department and subsequent in-patient care, we define that as a mental health crisis.</p> <p>This study will enable us to research which people have experienced a crisis and how often this occurs. We will examine whether people already making use of other mental health services are more or less likely to have a crisis. We will also consider measures which could reduce the need for emergency attendance. NHS Grampian patient records will be analysed using secure techniques to ensure the protection of patient privacy.</p> <p>Our findings will be discussed with health professionals, academics and the public to assist with our interpretation and to raise awareness. We will share our findings in academic journals, conferences and traditional and social media outlets. Our research will enable NHS Grampian to better plan their support of young people with mental health conditions, in primary and secondary care.</p>

<p>Professor Iain McEwan</p>	<p>The Role of Steroid Hormones in Wound Healing: Friend or Foe?</p> <p>During injury, the body tries to repair the damage. When we have a wound, the tissue goes through several stages of repair, including an inflammatory response and cellular growth. Immune cells, part of our defence against infection, are involved during these phases and are thought to play an important role in supporting wound repair. Although the stages are the same in both men and women, we find that wound healing is different between the sexes. For men, we find that they heal or repair these wounds more slowly than women. The differences we see between men and women are thought to be caused by the different chemical messengers (hormones) within our bodies. Male hormones are considered to reduce the ability of immune cells to support wound healing, whereas female hormones are thought to improve this process. Animal models suggest that male hormones slow down wound repair by altering the function of our immune cells, but it is unclear if this is also true in humans. We aim to address this gap in knowledge using blood samples from healthy volunteers to explore whether male hormones are responsible for slowing down wound healing. The results of this study will allow us to better understand how male hormones affect immune cells important for wound healing and consider how this could be used to help treat people suffering with delayed wound closure.</p>
<p>Dr Carrie Stewart</p>	<p>Evaluating the Impact of Older Peoples PPI contributions</p> <p>Public and patient involvement (PPI) involves lay persons working as partners to researchers. They may be involved in developing ideas, designing studies, and communicating findings. PPI is important for improving research. It can improve the quality of studies and stop studies that were not worthwhile in the first place.</p> <p>In 2019 we established a PPI group that focuses on matters involving older people and their health. Our members have given us their thoughts on research ideas, plain English summaries, and co-developing patient materials. We want to measure the value of our PPI groups' contributions to research. PPI groups are increasingly under pressure to demonstrate benefit, also known as 'impact'. However, there is no agreed approach to doing this.</p> <p>We want to find out what PPI 'impact' means and how it can be measured, in relation to older peoples' health research. This will be explored from different viewpoints, including PPI members, researchers, and funders, as selected by our PPI group. By speaking to these different groups, we can begin to develop a model for structuring how we measure PPI impact. In the future, we will look to test and improve this model with a larger number of people.</p>

<p>Professor Kay Cooper</p>	<p>Resistance exercise prescription for tendinopathy: a qualitative exploratory study of patients' and physiotherapists' experiences</p> <p>Tendons are cords of strong, flexible tissue that attach muscles to bones, allowing joints to move. Tendinopathy is a common condition that can affect any tendon in the body, causing pain and limiting function. Common tendinopathies include the Achilles (calf), knee (patellar), elbow (e.g., tennis elbow) and shoulder (formerly called impingement). People with tendinopathy are often seen by physiotherapists, with exercise being the mainstay of treatment.</p> <p>We know that exercise is safe and beneficial for tendinopathy, and that strengthening exercise is most often prescribed for people with tendinopathy. However, we also know that strengthening exercise is not always prescribed at the best dosage, and that sticking to an exercise programme for tendinopathy can be challenging.</p> <p>In this project we will interview people with tendinopathy about their experiences of physiotherapist-prescribed strengthening exercises, to understand the difficulties experienced by people with tendinopathy and potential solutions for overcoming these difficulties. We will also interview physiotherapists to understand how they prescribe strengthening exercise for tendinopathy, and why their prescription may not always be at the best dosage for recovery.</p> <p>The findings will address a gap in the evidence on exercise for tendinopathy and will support the development of patient-centred exercise interventions.</p>
<p>Professor Lesley Anderson</p>	<p>Investigating the incidence, prevalence and outcomes of myeloproliferative neoplasms to aid service planning and delivery in NHS Grampian</p> <p>Myeloproliferative neoplasms (MPNs) are a rare group of blood cancers that affect almost 8 people in every 100,000 within the UK. There is little known about the causes of these cancers, but it has been found that most MPN patients acquired a genetic mutation (or change) at some point during their life. These genetic mutations are used to confirm diagnosis. Due to its rare occurrence, there is limited information about the number of patients living with MPN in Scotland. This could impact the service provided by the NHS and negatively affect the service that patients with MPNs should receive. Therefore, we aim to determine the accurate number of MPN patients in NHS Grampian, understand more about the number of people living with MPN and listen to what they need from to improve the quality of care they receive.</p>

<p>Amelia Rudd</p>	<p>ConstAnt POver Testing – an alteRnative To maximal cardiopulmOnary exercISe tEsting (The Tortoise Study)</p> <p>Cardiopulmonary exercise tests are routinely used in clinical setting to determine the peak oxygen consumption (VO₂), the parameter considered the metric that defines physical performance limits of the cardiovascular system. Peak oxygen consumption is used to predict survival in several conditions such as heart failure and congenital heart disease. However, peak oxygen consumption has limitations as it is heavily influenced by the patient's ability and motivation to complete a maximal exercise test. In a clinical setting where the majority of patients are limited by cardiac or other co-morbidities, a maximal test is frequently not achieved. Therefore, this is precluding widespread use of peak oxygen consumption as an outcome measure in both routine practice and clinical trials.</p> <p>Critical Power is a suitable alternative parameter derived from Constant Power Exercise Testing, an alternative method for use with exercise validated so far only on a cycle ergometer – however, the cycle ergometer is less representative of daily activity than the treadmill. Constant Power Exercise Testing is easier for a patient to complete and could provide a more accurate estimation of the increase or decrease in exercise endurance. The purpose of this study is to establish and implement this novel parameter using the treadmill.</p>
<p>Professor Martin Collinson</p>	<p>A sight for sore eyes – antioxidant therapy for the blinding eye condition, aniridic keratitis</p> <p>Aniridia-associated keratopathy (AAK) is a potentially blinding corneal opacity caused by mutation in the eye 'master regulator' gene, PAX6. It is an unmet clinical need in that patients lose vision progressively, largely during later childhood and early life, with no cure for the corneal opacity. We want to develop eyedrop therapies that can halt or reverse the corneal degeneration. We are taking an approach to directly tackle the damage caused because the AAK cornea is fragile and loses barrier function, leading to inflammation, tissue stress and loss of corneal transparency. We have previously shown in vitro that an antioxidant, L-glutathione can reduce stress in AAK cells in tissue culture. The objective of this project is to incorporate glutathione into eyedrops and test it on the eyes of <i>Pax6</i>-mutant mice, that are excellent models of human AAK. If the experiments show evidence that vision improves after glutathione treatment, then antioxidant therapy can be trialled for human aniridia patients.</p>

<p>Kirstyn Anderson</p>	<p>Perceptions of an educational approach to transformative and sustainable practice for health and social care practitioners.</p> <p>Robert Gordon University (RGU), in collaboration with NHS Grampian, developed a unique course for health care support workers (HCSWs), the Diploma of Higher Education in Wellbeing and Enablement (DipHE). It is a 2-year, part-time, work-based learning course. It focusses on developing HCSWs' knowledge and skills in the areas of preventative approaches, health inequalities, person-centred care, and enhancing quality of life. It aims to transform the knowledge, skills and practice of HCSWs, so that this important subgroup of the healthcare workforce is well-equipped for supporting the wellbeing and enablement needs of the population that they serve.</p> <p>This project will explore the knowledge, views and experiences of HCSWs who are beginning the course, and those who have completed it, in order to find out how they are using the learning in their day-to-day work. It will also explore the views and experiences of other key stakeholders on what they think of this new learning and its impact on HCSWs practice and the wider team. These stakeholders are line-managers and colleagues of the HCSWs, and service users. The findings will provide initial evidence of the impact of this type of learning and inform future delivery of the course.</p>
<p>Dr Ekta Gupta</p>	<p>Co-production of resources with older adults for improving oral health literacy and awareness of the links between oral and general health in Grampian</p> <p>Healthy teeth and mouth (oral health) are important for overall health and well-being. As well as causing problems with eating and speaking, poor oral health increases the chances of developing conditions such as diabetes and, heart and breathing problems. If someone already has one of these health problems, poor oral health can make their condition harder to look after.</p> <p>A recent survey in Grampian highlighted that many older people do not know about these risks, and that information about oral health is not always provided. It was also highlighted that to successfully self-manage their health, this information and appropriate advice on how to look after their teeth and mouth needs to be provided in easy-to-understand formats that they can understand.</p> <p>We would like to engage with established PPI (public and patient involvement) groups and members of the public (no previous PPI involvement) interested in oral health to help us co-develop informative materials (for example, leaflets, short video etc.). These resources will aim to improve older people's understanding of oral health and provide information as to what they can do to improve their oral health. These materials will be valuable for improving both oral and general health of older people.</p>

<p>Prof Simon Parson</p>	<p>Is the blood-spinal cord barrier compromised in patients with Spinal muscular atrophy?</p> <p>Spinal muscular atrophy (SMA) is a childhood motor neuron disease. It targets the nerve cells (motor neurons) found in the spinal cord, which are the key link between the brain (where we plan and decide on movements) and the muscles (which produce the movements). Affected children lose or do not develop basic muscle control. If untreated, most children will not survive to their 3rd birthday. We have pioneered research showing that SMA also affects other body systems including the blood vessels which oxygenate the body. Blood vessels are especially important in the spinal cord where they form an essential barrier, controlling what can enter and exit the brain and spinal cord. We have experimental evidence suggesting this barrier is leaky and could further harm spinal cord motor neurons. We have a unique opportunity to determine if this barrier is leaky in living patients in Grampian region, because to receive treatment, some of the fluid that surrounds the spinal cord is taken from patients before treatment. This fluid is currently disposed of, but we could use it to test if the barrier is leaky. These findings will help understanding and may help to improve future SMA therapies.</p>
<p>Connor Bowbeer</p>	<p>Implementation of a Patient Management Pathway and a Rapid Point-Of Care Test for Group A Streptococcus to Improve Management of Paediatric Sore Throat</p> <p>Tonsillitis, also known as pharyngitis, in children is most often due to viral throat infections, which do not require antibiotics and usually recover without treatment. Less often, it is caused by bacteria called Group A Streptococcus (GAS), which is infectious and can lead to more significant conditions such as Scarlet Fever and Rheumatic Heart Disease. Also, there has recently been an increase in the number of GAS infections in the Scottish children's population. If GAS is suspected, a course of oral antibiotics is normally prescribed. A throat swab for confirmation of the bacteria may be sent to help decide whether antibiotics should be started or stopped, and this takes approximately 48-hours to perform. However, rapid point-of-care testing for GAS is available. This project aims to introduce a patient management pathway involving rapid testing into RACH Unscheduled Care areas, to assist clinicians assessing children with possible symptoms of GAS tonsillitis/pharyngitis. This will allow earlier diagnosis, appropriate antibiotics, and discharge advice if the test is positive. If the test is negative, then unnecessary antibiotics are avoided, reducing parental anxiety about administering medication, and reducing risk of antibiotic resistance developing.</p>

<p>Anita Laidlaw</p>	<p>What are the benefits and challenges of inter-sector collaboration to enhance the employability of school leavers to enter the health and social care workforce: a case study approach</p> <p>NHS Grampian and social care in Aberdeen, Aberdeenshire and Moray have lots of empty posts. Not having enough staff puts strain on those who are working. It also puts strain on services. There is no easy way to fill these posts. The problem can't be solved by one sector alone. This research will help us understand how different sectors such as schools and health boards can work together to help fill empty posts. We will look very closely at a local example of a project which brings together schools, NHS Grampian and local government to help fill the empty posts in health and social care. The project is run by the NHS Scotland Youth Academy. We will try to understand how different sectors can best work together. We will speak with all the different people involved as they develop the project. This will mean we understand how they go about finding ways to work well together. We will develop some recommendations with those involved in the project to help others in the same situation in the future. Lessons learned in this research can be applied to future NHS Scotland Youth Academy work here and across Scotland.</p>
<p>Professor Paul Fowler</p>	<p>Proof of concept: associating the presence of nanoparticles with localised gene expression changes in the human fetal lung</p> <p>Air pollution causes many problems for pregnancy, including higher risk of stillbirth or the baby being born small for its age. Air pollution includes very small particles, called nanoparticles, produced by incomplete combustion from sources like fires and fossil fuel engines. This year we showed that air pollution nanoparticles travel from the mother's lungs into her baby during pregnancy, meaning babies are born with air pollution in their lungs before they take a breath. We do not know whether nanoparticles cause direct damage to fetal organs, and it is technically difficult to find out. One approach is to image nanoparticles in slices of human fetal lungs, then use advanced techniques to investigate whether important genes change in nearby cells. The distribution of nanoparticles within the lungs means we can study 16,000 genes in groups of over 100 cells, comparing genes between cells near and far away from nanoparticles. Male and female fetuses will be studied separately to uncover sex differences. If this works, we will be able to perform large scale studies to understand health damage caused by air pollution nanoparticles and inform air quality regulators, pregnancy charities, and government about the risks to health of the next generation.</p>

<p>Dr Arnab Rana</p>	<p>Non-invasive in-vivo characterisation of postoperative low grade gliomas using Field Cycling Imaging</p> <p>Astrocytomas and oligodendrogliomas are tumours that insidiously infiltrate the brain, often causing surprisingly few symptoms when they are discovered as relatively large lesions from imaging. Magnetic Resonance Imaging (MRI) is a common way of taking pictures of brain tumours that offers many advantages but currently does not systematically detect glioma invasion and cannot differentiate certain sub-types of glioma.</p> <p>Aberdeen University is exploring a new MRI technology, Field-Cycling Imaging (FCI), that shows excellent potential for the detection of cancers using low magnetic fields. Our lab has the only human-size FCI scanners in the world and has been conducting successful clinical trials over a variety of diseases, discovering new biomarkers in stroke, cancer or fibrosis. Additionally, recent results from laboratory studies show that FCI is sensitive to glioma invasion and growth and the five pilot scans of glioma patient scans that we have performed all show the lesion accurately.</p> <p>This project builds on these exciting results to advance our study of brain glioma imaging by FCI. In particular, we want to know if this scanner can shed new light on the different types of brain tumour and whether it can differentiate between the sub-types of brain tumour which conventional MRI cannot.</p>
<p>Dr Edwin Amalraj Raja</p>	<p>The impact of duration of freezing of IVF embryos on pregnancy and perinatal outcomes – analysis of U.K. national data</p> <p>IVF (in-vitro fertilisation) involves mixing eggs and sperm together to create embryos which are then cultured in the laboratory. Usually, the best embryo is put back in the womb, while others can be frozen for future use.</p> <p>The use of frozen embryos has become popular in the UK, accounting for 41% of all IVF treatments in 2019. Although many embryos are frozen for short durations, others can be used after many years in the freezer, it is believed that patients can use them at any time without affecting their chances of pregnancy rates or the health of their babies. While earlier research has supported this view, more recent studies have challenged it.</p> <p>It is, therefore, really important that we explore whether the length embryos have been frozen can affect pregnancy rates as well as outcomes at birth in babies conceived from them.</p> <p>In this study, we will use the national Human Fertilisation Embryology (HFEA) database which collects all IVF data in the UK, to explore the impact of the duration of embryo freezing on pregnancy and outcomes in the babies. This research is timely as new UK legislation in 2022 has extended the storage of IVF embryos from 10 to 55 years and it is critical that patients and clinicians have the necessary facts so that they can make informed choices.</p>