

HEALTHY LONGEVITY GLOBAL COMPETITION

2021 Catalyst Awardees

Sponsor: UK Research and Innovation

A Career Pipeline for 50+ Service Leavers

Principal Investigator	Matt Flynn
PI Primary Affiliation	University of Hull
Co-Investigator(s)	None

PROJECT DESCRIPTION

Every year, ~1,200 veterans leave the military after the age of 50 and look for civilian work that they value. However, many struggle to navigate the civilian job market and may spend years in low paid or precarious work before they find a second career. Simultaneously, while employers value the skills and experience that come from long military service, they are often uncertain about how to bring in and develop the talent of 50+ Service leavers. A career pipeline that can better match 50+ Service leavers with employers who can make good use of their skills is therefore urgently needed and will ensure that military-acquired skills continue to contribute to the UK economy.

In partnership with the Officers Association and Forces Employment Charity, I will work with 50+ Service leavers in building a transformative career support service that will help veterans find a 'new mission' in the civilian workforce, delivering an effective solution that allows veterans to gain at least five extra years of healthy and independent living. The project focuses on long-service veterans who have been underemployed since leaving the military and could benefit from personalised and peer-to-peer support like mentoring, job trials and career planning. By tapping into the comradeship and shared experience of military service, 50+ veterans will help one another in building successful civilian careers. More widely, this project will provide a model for supporting older jobseekers in building second careers.

Active Ageing Environments

Principal Investigator	Nick Hamilton
PI Primary Affiliation	Sheffield Hallam University
Co-Investigator(s)	Maxine Gregory

PROJECT DESCRIPTION

Physical activity has been engineered out of our lives; mechanization, automation and digitization have left us sedentary, indoors and tied to our screens. Physical inactivity adversely effects health, mental wellbeing and quality of life at all ages and across all sectors of society. As our population ages the cumulative effects of this lack of physical activity, movement and connection with the outdoors is severely detrimental to average healthy life expectancy. Midlife and older adults represent the most inactive portion of the population.

If people have appropriate information, opportunities and tools at the right time they have higher levels of activation, tend to experience better health and engage in healthier behaviours. The built environment impacts our health and wellbeing as it affords opportunities to be physically active in the spaces between and around

buildings. Good design creates physical activity opportunities through access to green spaces, walking and cycling connections and links to community facilities.

The national housing shortage will be met by developers driven by profit, delivering thousands of houses in the same mould. We intend to show that the return on investment in better design, will increase their profits while also improving health. By creating better, more desirable places to live, the value of land and houses increases. By embedding opportunities for physical activity at the design stage, creating active aging environments, communities grow and grow healthier.

AI-enabled Portable Incontinence Management Device

Principal Investigator	Srinjoy Mitra
PI Primary Affiliation	University of Edinburgh
Co-Investigator(s)	Kianoush Nazarpour; Susan Shenkin

PROJECT DESCRIPTION

An overactive bladder is a common medical condition, particularly among the elderly. It leads to urinary incontinence (UI) and influences the quality of life for around 40% of those above 75 (>6million people in UK). People often consider this as a natural progression to old age and do not actively seek any treatment. However, UI is one of the main factors why the elderly lack confidence and give up their independence to move to care homes.

Conventional approaches to treat UI, e.g., drugs and bladder-catheterisation have several side effects (e.g., dry-mouth, constipation, confusion). Invasive electrical stimulation of the Tibial nerve (around the ankle) is an established alternative treatment. But a needle electrode inserted into the leg can be painful and distressing. Recently, a non-invasive version of this method has been demonstrated to be successful for older adults. However, it comprises multiple hospital visits per week over a duration of 2 months. Such a long treatment process leads to reduced adherence especially for the frail elderly who have already accepted UI to be a part of their life.

We propose an instrumented sock that the user can wear comfortably throughout the day, while electrodes weaved into it will stimulate the tibial nerve when necessary. The stimulation parameters will use an AI-based algorithm (via a smartphone) set by the clinician. The proposed system can be tried by a larger section of the population without surgery or repeated hospital visits. Hence, users will have much greater privacy and flexibility in managing incontinence.

Co-Developing a Peer-to-Peer Mentorship Program (P2MP) for People Living with Dementia

Principal Investigator	Laura Booi
PI Primary Affiliation	Leeds Beckett University
Co-Investigator(s)	None

PROJECT DESCRIPTION

In the UK there are 850,000 people living with dementia (PLWD). Half of all PLWD receive insufficient post-diagnostic support, suffering from high rates of social isolation, loneliness, and low quality of life. With increasing rates of dementia, PLWD have highlighted a need for opportunities to support one another, for sharing information and to foster a sense of hope and resilience. Marginalized and socially disadvantaged individuals, such as members of Black, Asian and Ethnic Minority groups and the LGBTQ community, have both higher risks of developing dementia and then greater difficulties accessing and receiving support post diagnoses.

The proposed project is to co-develop a peer-to-peer mentorship program (P2SP), utilising video-conference technology, with PLWD and their care partners, where appropriate. There will be an emphasis on including those who are experiencing compound marginalization, both living with dementia, as well as being a member of a marginalized group. Collaborations with Volunteer, Community and Social Enterprises will be incorporated into the project design to maximize adoption from marginalized populations. The P2SP will benefit health care providers by offering another option for social prescribing post-dementia diagnoses.

The desirability, feasibility and viability of the P2SP has already been reviewed and is enthusiastically supported by national and international dementia advocacy groups. Led by Dr Laura Booi, a social gerontologist with over a decade of experience co-developing ventures with PLWD and care partners, this project will also work in collaboration with the National Innovation Centre for Ageing and in conjunction with Dementia Alliance International.

Co-developing a sustainable, meaningful, digital platform to enhance mobility and active ageing of community dwelling older adults (>75 years).

Principal Investigator	Khalid Ali
PI Primary Affiliation	University of Sussex
Co-Investigator(s)	Henglin Lisa Chen, Sally Fowler Davis

PROJECT DESCRIPTION

Remaining mobile is important to older people in enabling them to participate in meaningful social, cultural, and physical activities, accessing neighbourhood facilities, and belonging to a community. The adverse impact of limited mobility in old age includes loss of autonomy, social isolation and loneliness, dependency, depression, and even placement in care institutions, with associated cost to society and economy. Following the COVID- 19 Pandemic, older people were predominantly affected by physical de-conditioning during lockdown.

ExtraCare is a UK national supported-living provider committed to improving and sustaining a healthy lifestyle in old age in their villages. We will undertake an exploratory study of the experience of some ExtraCare residents about what is wanted and needed to sustain their mobility using a wearable device. Our technology partner, CUSH company will work with study participants from 2 ExtraCare villages (Birmingham and Sheffield) to understand residents' priorities around mobility. We seek to uncover ways where mobility is fundamentally about all sorts of movement, and not only physical exercise. Our aim is to co-create with older people and their care providers a user-friendly digital platform (application) where individual data can motivate an older person to improve their physical and mental health. We will work closely with people who are less active, over 75 years sharing with us their physical, environmental, and personal preferences.

Our work with village residents and care staff will enable ExtraCare and CUSH company to understand the fundamental requirements of a community-based digital approach supporting a healthier lifestyle in old age.

Counselling People with Dementia: a feasibility study investigating the potential for accessible therapy delivered through a social enterprise model

Principal Investigator	Gillian Mathews
PI Primary Affiliation	University of Edinburgh
Co-Investigator(s)	Heather Wilkinson

PROJECT DESCRIPTION

We want to test an accessible, community-based, counselling model to help meet the emotional health and well-being needs of people with dementia.

There is a clear gap in counselling for people with dementia (PwD) and carers. The people I interviewed spoke about difficult emotional challenges linked to their experience of loss and concerns about the future. Currently, counselling interventions are poorly accessed by PwD and under-researched. Most therapists have no training in this area and typically, those working in dementia services have no counselling skills. Despite support being a Human Right for PwD, many health staff and therapists are not aware of the potential benefits of therapy. It is clear from my interviews that this is not true.

I want to work with Zinc, PwD, carers and counsellors to develop an accessible counselling model that can significantly improve the mental health of PwD and others. Firstly, we need to test the research methods. and then test the dementia-friendly counselling model.

Success means that a) PLwD, carers and counsellors are involved in the research process ensuring our ideas and methods are ethical, creative and fit for purpose; b) Using the findings from testing the methods, counselling process, and potential investor feedback, we co-create a tiered counselling training and delivery package for use across different public services, the third sector, community groups and businesses; c) Sale and delivery of the package enables accessible and tailored counselling opportunities, helping to tackle loneliness and stigma; d) PwD and carers can choose how and where they access therapeutic support.

Developing an online support platform for unpaid carers

Principal Investigator	Philipp Friemann
PI Primary Affiliation	London School of Economics (LSE)
Co-Investigator(s)	None

PROJECT DESCRIPTION

In the UK there are over 7 million unpaid carers who provide vital support to relatives, partners or friends who require help with daily living. Unfortunately, many of them feel lonely, unsupported and are lacking information on how to best manage their role in the long term. The most common support available are peer support groups. These are attended by some carers, but others struggle to leave their homes or do not feel comfortable opening up face to face with strangers. What might more accessible support for those carers look like?

I propose to develop an online platform that will allow unpaid carers of older adults to join a chat group with peers and a support worker where they will receive guidance and emotional support. They will also have access to information to support them in their role and exercises to help them manage their wellbeing. The chat-based format will not be attractive for everybody, but for some people this medium really works. It is also attractive for providers as it could allow them to reach greater numbers of carers at reasonable cost. Of course, such a platform needs to be designed carefully to ensure that carers feel comfortable chatting and receive the information and support they would like. I will develop the solution in close collaboration with carers while also drawing on the latest insights from social psychology and wellbeing research.

Development of an Intelligent Robotic Knee Device to Support and Monitor Rehabilitation Therapy for the Ageing Population with Knee Osteoarthritis

Principal Investigator	Aiqin Liu,
PI Primary Affiliation	University of Leeds
Co-Investigator(s)	Shane Xi Louise Jennings

PROJECT DESCRIPTION

Knee osteoarthritis is one of the leading causes of chronic pain and disability in older people. Rehabilitation exercise is an essential treatment to reduce osteoarthritis pain, improve knee function and increase mobility. It is important for clinicians to be able to monitor certain signals such as load (weight) and motion during the exercise, so that they can develop a personalised rehabilitation plan for each patient. Currently, clinicians have no access to these signals and they have to use questionnaires and simple functional tests to evaluate the effect of the exercises. This relies heavily on individual experience rather than personalised monitoring, so patients often do not receive the best treatment to meet their needs.

This project will develop a knee device to support and monitor rehabilitation and provide scientific evidence for clinicians to evaluate the rehabilitation progress for their patients. This will ensure that patients get the best rehabilitation treatment which will relieve pain, improve overall physical knee function and prevent disability.

Patients will wear the device during their rehabilitation exercises and daily activities. Real-time feedback from the device will enable patients to monitor and manage their rehabilitation progress. Physiotherapists can adjust the exercise programme remotely to meet the patients' individual needs by analysing signals collected from the device. Patients will also get real-time muscle support from the device to help them achieve exercise goals or do daily activities such as walking, gardening or climbing stairs. With this device, older people can enjoy physical activities, living longer and more fulfilling lives.

Development of the WESTERN plan for supporting active ageing in retirement and care facilities

Principal Investigator	Max Western
PI Primary Affiliation	University of Bath
Co-Investigator(s)	Ross Watkins

PROJECT DESCRIPTION

This research aims to address the problem of maintaining mobility, wellbeing, and quality of life in older adults in sheltered accommodation, assisted living, care homes and people who require outreach care. In other words, this project will aim to provide a personalized programme that transforms these settings into ones that facilitate rather than impeded active ageing.

Often when individuals reside in such facilities there is a tendency to succumb to an ageing stereotype characterized by a detachment from the wider social community, a reduction in physical activity, apathy towards cooking and eating healthy, balanced meals, and feelings of helplessness. Consequently, age-associated conditions such as cognitive impairment, loss of physical function, frailty and poor mental health are highly prevalent within this population.

Fortunately, many of these issues are preventable (or at the very least, can be decelerated) through simple lifestyle behaviors. Providing a system to motivate, prompt and support older adults to include health-enhancing 'self-care' behaviors into their daily routines can promote active ageing, and curb any preventable mental, physical, and emotional decline.

The WESTERN plan (Walking, Exercise Snacking, Tai-chi, Edification, Relationships, Nutrition) aims to provide a simple, personalized programme that is rooted in behavioral science to optimize motivation, engagement, and acceptability. The plan, which will be provided on a target-user informed digital platform for integration of behavior change techniques, scalability and dissemination, will provide structure for users, care staff and family members and act as a basis for continued growth, value, belongingness and thriving health and wellbeing in residents.

Exploring How to Use Mixed Reality and Telepresence to Tackle Loneliness and Reduce Feelings of Social Isolation

Principal Investigator	Daniel Finnegan
PI Primary Affiliation	Cardiff University
Co-Investigator(s)	None

PROJECT DESCRIPTION

In the UK, it is estimated that around 1.5 million aged 50 and over suffer from chronic loneliness, and 40% of older people say the television is their only company. These numbers are continually rising, putting a strain on social services such as the NHS, as well as other relatives who want the best for their loved ones. How is loneliness still a problem today, in a world dominated by 'social' media, where we have so many tools and technologies to connect with one another? The answer may lie in the shallow experience of connectedness these technologies provide. Connectedness is more than just being connected. It requires a shared understanding, the chance to socialize, agency and independence, and to share meaningful experiences and interact with other human beings. Through co-design workshops, low-fi prototypes, and user studies, I will explore how mixed reality—technology which lets us combine the real and digital worlds—may help establish deep relationships to relieve loneliness. We can chat and gossip with friends and family as if they are in the same room with us, and even host events from our own living room. The benefits greatly outweigh the costs: for example, the devices necessary to fulfill my vision of tackling loneliness by connecting people through mixed reality would cost less than a branded refrigerator. As a researcher and co-director of a community interest company, I bring a unique set of skills and intrinsic motivation to work on projects with tangible benefits for ordinary people.

Improving Quality of Life for Older Autistic People

Principal Investigator	Marion Hersh
PI Primary Affiliation	University of Glasgow
Co-Investigator(s)	Michael Dawson, University of Glasgow Panda Mery, University of Glasgow

PROJECT DESCRIPTION

The Problem: Exclusion and isolation of autistic people; Lack of knowledge and understanding of the needs of older autistics; Barriers to contributing to society (right not privilege), though (older) autistics have a lot to offer; Experience and expertise of (older) autistic people undervalued.

Proposed Solution: Autistic people will have a major role in developing it. The following scenarios illustrate what it will look like.

Scenario 1: Older autistic person living with their parents; Unnecessarily dependent; Parents getting older and contacted charities whose solutions continue dependence.

Using the solution: Tools and information about confidence building and assertiveness; Links to groups of autistic people to discuss problem and possible solutions and for companionship; Tools to structure thinking about options and work out what is best. E.g. mindmapping tools; Links to advocates who can help them.

Benefits: Able to plan for changing living situation; Increased control of own life, independence, self-confidence and assertiveness; Increased opportunities for relationships and activities; Improved health.

Scenario 2: Frustrated older autistic person; other people take advantage of them and put them down at work; no opportunities to use or develop their skills; Not given the training that leads to opportunities; Age discrimination

Using the Solution: Confidence building and assertiveness tools; Tools and information to identify new options; Links to advocates: guidance in completing applications for new job or college/university or talking to employer about training and a better job.

Benefits: Awareness of range of options; Able to determine and implement changes; Greater satisfaction and feeling of worth.

It Takes a Community to Prevent a Fall

Principal Investigator	Susan Dewhurst
PI Primary Affiliation	Bournemouth University
Co-Investigator(s)	None

PROJECT DESCRIPTION

Aim: To develop a community based, easily accessible self-referral tool to identify individuals in the community who are at risk of a fall and/or a fracture.

Vision: For each community to host self-service screening kiosks located with GP surgeries, pharmacies, libraries etc. Older adults, or their friends or family, would answer a series of questions taken from a previously validated questionnaire and be classified as Low, Moderate or High risk of a fall or fracture. All users irrespective of classification will be offered a resource package containing information and activities to maintain good balance and bone strength.

Individuals identified as moderate to high risk of a fall, will be invited to a full fall and fracture prevention health check. This assessment will be by a trained fall prevention specialist. This will include muscles strength and balance assessments, bone fracture risk assessment, eyes, ears and feet assessment. Following this assessment, specific recommendations will be made as to how to lower fall and fracture risk.

Where appropriate, interventions will be offered to help to prevent a future fall and fracture. This may include an invitation to our strength and balance class and/or referral to an optician, audiologist, pharmacist or podiatrist. Where necessary, we will liaise with the health service for referral to specialist services such as home hazard assessment or the fall prevention clinic at the local day hospital or equivalent.

Leveraging digital phenotyping to monitor and support patients with vision loss beyond the clinic

Principal Investigator	Lee Jones
PI Primary Affiliation	University College London (UCL)
Co-Investigator(s)	Kishan Devraj

PROJECT DESCRIPTION

Glaucoma is among the top three causes of irreversible visual impairment in the UK and Worldwide. The impact of sight loss in glaucoma is complex, affecting aspects of daily functioning, mobility, and quality of life. Glaucoma cannot be cured; treatments are designed to slow or halt disease progression, necessitating lifelong hospital monitoring. There is growing difficulty for the hospital eye services to effectively monitor the glaucoma patient caseload. Indeed, people with glaucoma are losing their sight due to lack of timely monitoring. There is a need for innovative changes in the current glaucoma patient pathway in order to achieve better patient outcomes and higher quality care.

Smartphones are increasingly being used to collect health information. Digital phenotyping refers to using smartphone generated data to build a picture about an individual's lifestyle and health state. There is scope for

this data to be translated into indicators of clinically symptomatic behaviour. For example, these data could aid clinical decision-making as reduced mobility may indicate a decline in visual functioning and progression of glaucoma. Care providers can be alerted by these digital signals and schedule a clinical assessment and intervention, such as treatment augmentation, provision of visual aids, or counselling support.

Combined with routine clinical data, digital phenotyping could emerge as a powerful tool to establish the real-world impact of glaucoma and help to prevent avoidable sight loss. This approach may ultimately facilitate a more sustainable approach to glaucoma care by measuring outcomes which are relevant and meaningful to the patients themselves.

Making Reading Real

Principal Investigator	Aida Suárez-González
PI Primary Affiliation	University College London (UCL)
Co-Investigator(s)	None

PROJECT DESCRIPTION

What is the problem I am solving?

How would you feel if, while reading this text, letters and words started merging or disappearing, making your reading impossible, and you knew there was nothing you could do to recover your reading ability? Frightening. Devastating. That is precisely the experience of millions of people in the world who have had a stroke or live with neurodegenerative conditions affecting the back of the brain – the area that controls vision.

Science cannot repair a damaged brain, but in my research, I found a way to manipulate the text displayed in a reader device to compensate for this brain damage and make reading possible again. My idea is to convert these manipulation techniques into a commercially viable app to bring reading back to the lives of people with brain injury.

What are the key benefits of this innovation?

This app will:

- 1) fill a global gap in healthcare, since no other assistive readers exist for people with neurological conditions,
- 2) be universally available, free of charge, across all operating systems and web-browsers so no one with access to the internet will face barriers to use it,
- 3) have customized settings to suit the type and severity of neurological impairment,
- 4) operate in any language, that is, give millions of people in the world the opportunity to read again, and
- 5) my international implementation plan will make the reading app widely recognised in healthcare and rehabilitation settings worldwide.

Precision Medicine in the Home for Real-Time Zero-Effort Monitoring of Health

Principal Investigator	Ali Salehi-Reyhani
PI Primary Affiliation	Imperial College of Science, Technology and Medicine
Co-Investigator(s)	None

PROJECT DESCRIPTION

Our existing approach to healthcare is reactive and based on limited physiological information, collected months, years or even decades apart. Digital health technologies propose to solve this but often requires individuals to

actively administer self-testing. This is a daunting prospect for any individual, particularly for the elderly. We propose to overcome this with the development of a toilet-based precision healthcare platform deployed in the home to measure urinary biomarkers of disease. It is zero-effort taking samples autonomously without user intervention and can measure biomolecular signatures of health from urine over time. The aim is to take a personalised medicine approach to detecting disease early at the population scale. I lead the Analytical Systems Research group at Imperial College London, miniaturising the technology that is used conventionally to test patient samples in centralised facilities today. We are developing methods to detect urinary biomarkers for cancer, diabetes and heart disease and there is a growing body of literature reporting biomarkers for the early detection of Alzheimer's disease and dementia. While the core technology is well-developed, there are significant, largely non-technical, barriers to the adoption of 'big-tech' precision health solutions by the general population, which we will explore and investigate strategies to solve as part of this project: we will research the barriers to adoption by users and stakeholders, how the molecular data generated can and should be used, as well as conducting pilot projects focussed on the user interaction and engagement elements of the system.

Preventing avoidable blindness through smart home-monitoring of vision

Principal Investigator	Pete Jones
PI Primary Affiliation	University of London
Co-Investigator(s)	None

PROJECT DESCRIPTION

Glaucoma is the second leading cause of irreversible blindness. It affects 1 in 50 people over 40 years old, all of whom must currently travel to hospital once or twice a year for vision checks. Over 1M such "monitoring" assessments are carried out by the NHS every year.

These hospital visits are not only inconvenient: they are unsustainable. Even before COVID, NHS backlogs meant that twenty patients a month were going blind due to delayed glaucoma appointments, and patient numbers are expected to double by 2030. Hospital-only monitoring is also insufficient for the 1 in 23 people with the most aggressive form of glaucoma. Such individuals are liable to experience sudden, irreversible sight loss between hospital appointments.

The solution is home-monitoring. If people could check their own vision at home, then sight loss could be detected more quickly, conveniently, and cheaply. People could choose to test their vision more frequently, or when they started to notice a change: allowing sight loss to be flagged and treated sooner. Lower risk patients could attend fewer hospital appointments: reducing unnecessary travel, and freeing up resources to focus on those most in need. And by testing vision at home, more time in the clinic could be spent talking to the doctor face-to-face.

That is why over the last eight years we have developed Eyecatcher: the world's first validated vision test for glaucoma home-monitoring. The challenge now is to scale up Eyecatcher, and get it into the hands of patients, in a sustainable, cost-effective way.

Re-dressing Ageism in Fashion

Principal Investigator	Hannah Swift
PI Primary Affiliation	University of Kent
Co-Investigator(s)	None

PROJECT DESCRIPTION

Ageism in the fashion industry is widespread and costly to businesses, consumers and wider society. Consumers feel excluded from mainstream fashion because ageing is not reflected positively, if at all, in the

industry or in the imagery we see in magazines and adverts. The industry defines what we should wear by shaping what we think and feel is age appropriate. This restricts people's choices and makes it hard for people to express themselves through mediums of fashion (clothing, dress, hairstyles & make up) in a way that makes them feel good about their age. Businesses lose out by failing to cater to the aesthetic needs and desires of an ageing population who want to look and feel good. This project wants to re-dress ageism in fashion by, 1) raising awareness with fashion brands and wider industry businesses of ageism, and the ways it manifests in the industry; 2) understanding and providing innovative solutions to the challenges businesses face in addressing ageism, such as how to diversify imagery by using older models in a way that retains a brand's image and appeal, and doesn't alienate younger consumers. This will benefit consumers by increasing choice and freedom to express who they are, and crucially, feel good about it, no matter what their age. It will benefit businesses by opening up to new markets and customers, and it will benefit wider society by reducing anti-ageing narratives and imagery, which perpetuate negative attitudes and stereotypes that underpin ageism in society.

ReViewing Physical Activity in Older Adulthood

Principal Investigator	Fiona Gillison
PI Primary Affiliation	University of Bath
Co-Investigator(s)	Elisabeth Grey; Julie Barnett,

PROJECT DESCRIPTION

Increasing physical activity in older age helps to reduce, delay or even reverse the development of chronic diseases, and can improve mobility, enhance wellbeing and reduce social isolation. However, most older adults don't get enough physical activity to benefit. Some of this may be due to negative social stereotypes about what older adults can and cannot do, and depictions of older people as frail and incapable. Negative stereotypes make older adults feel less welcome or accepted in the spaces where activity happens, deter physical activity and reduce social support. They can also deter the providers of products and services that promote physical activity from catering for older adults.

This project aims to challenge and reverse negative stereotyping of ageing and physical activity through creating 'trigger films' to spark a societal shift in opinions and attitudes, prompting people to see things differently. This needs action at a whole-society level. Cultural and social changes in attitudes and norms in other stigmatised groups have been influenced by specific, memorable moments that caught public attention. For example, TV shows with provocative storylines about homophobia and mental health, or David Attenborough's Blue Planet triggering combined public, policy and industry action to reduce plastic use.

I will bring expertise in communication theory and behavioural science to harness this approach and apply it to the portrayal of physical activity in later life, working with creative industries and older adults themselves. We will co-create attention-grabbing and attitude-shifting video resources and test their effects on reducing stereotypes across society.

Storytelling games for social connection and reminiscing by older people

Principal Investigator	Sarah Campbell
PI Primary Affiliation	University of Surrey
Co-Investigator(s)	David Frohlich

PROJECT DESCRIPTION

As people live longer, the number of older adults globally is growing. This presents a growing problem: the number of older adults experiencing loneliness. Currently, over a quarter of adults over 65 are socially isolated. In the UK alone, over a million older adults go more than a month without speaking to friends, family or

neighbours, and 1.4 million are chronically lonely. Loneliness is associated with increased risk of dementia, heart disease, poor mental health and early death. The risk loneliness poses to public health explains why addressing loneliness for older adults is a key priority for the UK government and the UN.

Our project aims to reduce loneliness in older adults. We propose a novel, enjoyable and engaging way for older adults to get to know new people easily within their community, as well as build and deepen relationships with each other, their families, friends and wider society. Our solution is particularly relevant for when older adults have had to move, often due to bereavement, downsizing or requiring additional support or care needs.

We are proposing an augmented reality board game that facilitates storytelling, reminiscing, and capturing and celebrating lives. This creates quality connection and is a social experience played in-person or remotely. Most importantly, this is an experience initiated and directed by older adults themselves. We are co-designing this game with older adults of low socioeconomic status, ensuring an accessible, low cost and inclusive solution.

The gut-sleep-brain axis: Targeting the gut microbiota and sleep quality by individualized non-pharmaceutical approaches to promote healthy ageing

Principal Investigator	Alpar Lazar,
PI Primary Affiliation	The University of East Anglia (UEA)
Co-Investigator(s)	D Vauzour

PROJECT DESCRIPTION

We live in an ageing society struck by cognitive decline and high prevalence of dementia. With the numbers continuously increasing, it is estimated that dementia will triple by 2035. Besides its detrimental impact on healthy longevity and quality of life, this will lead to substantial economic and societal burden. To make matters worse, one third of the UK adult population presents disordered sleep and the prevalence further increases with ageing. This is alarming provided the amounting evidence establishing sleep problems as causal predictors of age dependent cognitive impairment and dementia. Unfortunately, sleep problems in ageing are complex, often with multiple causes in an individual with no one-size-fits-all treatment approach. Thus, there is a lack of effective treatments of sleep problems. The available pharmaceutical means have significant side effects, can be used for a limited time only and the cognitive benefits of drug induced sleep are minimal or lacking. Furthermore, sleep problems are commonly overlooked and/or ineffectively addressed in both the primary and secondary healthcare system. The potential solution requires a range of options to support individually tailored interventions addressing the specific needs. Our proposal builds on emerging evidence showing a reciprocal relationship between gut health, sleep and brain functions. We aim to develop effective, low cost, individually tailored and broadly accessible intervention alternatives with no side effects using a range of innovative non-pharmaceutical methods including brief behaviour therapy, auditory closed loop stimulation of deep sleep and dietary supplements to improve sleep quality, brain function and gut health in older people.

The Oxford CLEAR Pathway

Principal Investigator	Sheera Sutherland
PI Primary Affiliation	Oxford University Hospitals NHS Trust
Co-Investigator(s)	Andy Meaney; Patrick Doherty; Helen Dawes

PROJECT DESCRIPTION

For older adults, exercise improves fitness and health, maximises participation, increases functional independence and enhances quality of life. Higher fitness-levels are linked to lower levels of emotional distress and depression, improved mobility, functionality and independence encouraging a higher level of behavioural activation and social inclusion.

Adherence and compliance with recommended exercise guidelines remains poor amongst ageing adults who frequently avoid participation for fear of falling, exacerbating symptoms or provoking pain or fatigue. The shortage of appropriately qualified trainers means some institutionalised elderly are sedentary for over 12 hours a day, their only energy expenditure being when getting in and out of bed.

We have created a series of bed and chair-based programs for older adults, some of whom may be resistant to exercise, providing a graduated course of physical activity suitable for everyone, from the very frail to the healthy agile.

We will engage older adults who may be isolated, bedbound, frail, have multiple health conditions, physical disabilities, learning difficulties or mental health issues, and lead them through specialised bed and chair-based exercises given remotely, linked by a live-stream platform such as Webinar or Zoom, presented on large-screen TV, through their own smartphone, tablet or laptop enabling everyone to work in a group. The sessions will be supplemented by videos and an App.

During the next 12 months we will complete the filming, select the live-stream platform and test the system in community settings with the aim of producing a solution ready to roll out to the Care Home sector.

Upstream Strength Training Interventions to Improve the Ageing Trajectory of Women in Midlife

Principal Investigator	Anna Lowe
PI Primary Affiliation	Sheffield Hallam University
Co-Investigator(s)	Helen Humphreys Rebecca Partridge

PROJECT DESCRIPTION

Falls in later life are a major threat to healthy ageing. They can lead to pain, injury, and loss of independence. Falls have a significant impact on health services, both immediate hospital care and long-term aftercare.

The 60+ age group is growing faster than any other age group, therefore problems related to falls will increase. Women express fear of falling more than men and they sustain more hip fractures from falls. Current approaches focus on older people who have had a fall or are at risk of falling. More proactive approaches are needed earlier in life.

Muscle strength is an essential 'building block' for healthy ageing. Strength declines as we age but it can be maintained through exercise. Approximately half of all women aged 45 years and over, do no regular strength exercises.

The aim of this project is to find ways to make it easier for women in midlife to do regular muscle strength training. This would enable them to arrive at the 'start line' of later life in better health and with greater physical reserves.

We would work closely with women in midlife to understand their thoughts and opinions about strength training. We want to understand what makes it harder for them and what might make it easier. We will co-create a range of potential ideas and solutions, these will be tested out with other women and with key partners including healthcare professionals, academics, designers, fitness professionals and people who influence policy.