EUROPEAN FALLS FESTIVAL

2nd and 3rd July 2018
Manchester, United Kingdom

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Monday 2\textsuperscript{nd} and Tuesday 3\textsuperscript{rd} July 2018

Manchester, United Kingdom
It is our pleasure to welcome you to the fourth European Falls Festival hosted at the University of Manchester, UK on 2nd and 3rd July 2018.

The 2018 theme is **New Solutions to Old Problems: ensuring sustainability of falls prevention interventions** and includes key note speakers representing the Centre for Disease Control (China), NHS England, Public Health England as well as leading healthcare practitioners and internationally renowned scientists and researchers from across Europe and the rest of the world.

The 2 day programme offers key note addresses on Falls & Cognition, Cochrane Updates and will launch the Chief Medical Officer’s (England) Review of Physical Activity 2018. These sessions will be complemented by plenary discussions, seminars and workshops and a ‘living lab’ during which delegates can visit exhibitors and where possible, test or watch demonstrations of novel technologies.

The Festival will provide an excellent opportunity for scientists, health care professionals, policy makers, organisations and key stakeholders including older people involved in the specialist area of falls prevention research, novel interventions, implementation and technologies to network and discuss current key issues.

As Festival Chairs we would like to take this opportunity to thank members of the European Falls Festival Steering Committee (see below), all of whom contribute time and energy to assisting in the development, organisation and delivery of the programme. We also extend our gratitude to our sponsors along with all the speakers, workshop presenters, exhibitors and poster contributors who will make this year’s Festival undoubtedly a great success.

We hope you enjoy the two days.

Chris Todd, Clemens Becker and Lorenzo Chiari (Festival Chairs)
Jane McDermott (Festival Manager)

**European Falls Festival Steering Committee 2018**

**Chris Todd**, Professor of Primary Care & Community Health, University of Manchester, UK  
**Lorenzo Chiari**, Professor of Biomedical Engineering, University of Bologna, Italy  
**Clemens Becker**, Professor and Head of Department of Geriatric Medicine, Robert-Bosch Krankenhaus, Germany  
**Dawn Skelton**, Professor in Ageing and Health, Glasgow Caledonian University, UK  
**Kim Delbaere**, Associate Professor, Neuroscience Research Australia, Australia  
**Heribert Baldus**, Principal Scientist, Phillips Research Europe, Netherlands  
**Amanda Clifford**, Senior Lecturer Physiotherapy, University of Limerick, Ireland  
**Wim Rogmans**, Advisor to Executive Board, Eurosafe  
**Jane McDermott**, Festival Manager, University of Manchester, UK
REGISTRATION DESK

The Registration Desk is located in the Drum (Ground floor) of University Place (176 Oxford Rd, Manchester M13 9PL) and will be open at the following times:

Monday, 2nd July: 08:30-18:00
Tuesday, 3rd July: 08:00-17:00

NAME BADGES

Monday 2nd July - please arrive at the venue no later than 10:00 to allow time to collect your name badge and for transfer to University Place.

Tuesday 3rd July – please arrive at the venue no later than 8:30. We will commence at 9:00 promptly

Please wear your name badge at all times.

CATERING

Light refreshments and lunch will be served at the programmed times throughout the two-days

SPECIAL DIETARY REQUIREMENTS

If you have requested as special diet (please note ample vegetarian food will be served at the main catering stands) then please ask at the registration desk as a special diets table will be set up for your convenience.

ROOMS FOR SESSIONS

Keynote and Plenary Session - Lecture Theatre A (3rd Floor)

PARALLEL WORKSHOPS

Monday
- Workshop A - Room 2.218 (2nd Floor)
- Workshop B - Lecture Theatre A (3rd Floor)
- Workshop C - Room 2.220 (2nd Floor)

Tuesday
- Workshop A - Room 2.220 (2nd Floor)
- Workshop B - Room 2.218 (2nd Floor)
- Workshop C - Lecture Theatre A (3rd Floor)
PARALLEL WORKSHOPS

Thank you for pre-selecting which workshops you would like to attend during the 2 days. Please see the festival programme for location details of each workshop and kindly stick to your original selection, as rooms have been allocated according to capacity.

EXHIBITION STANDS

We are delighted to welcome a number of organisations to this year’s Festival, and thanks them for their ongoing support:

MICRA  https://www.micra.manchester.ac.uk/
Northern Health Science Alliance  http://www.thenhsa.co.uk/
Manchester City Council  http://www.manchester.gov.uk/
British Society of Gerontology  https://www.britishgerontology.org/
Manchester Marketing  http://www.marketingmanchester.com/
Later Life Training  https://www.laterlifetraining.co.uk/
PAL technologies  http://www.palt.com/
Kinesis Health Technologies  https://www.kinesis.ie/
Gait Up  https://gaitup.com/
Turun UK LTD  http://turun.co.uk/

Please see floor plan of the Drum for reference

POSTERS FROM SHOWCASE YOUR WORK

The poster displays will be located in the Drum. Please take the time to visit the poster displays as a lot of time and effort goes into their creation.

WELCOME RECEPTION

Monday 2nd July - Lord Mayor's Reception

An evening reception hosted by the Lord Mayor of the City of Manchester, Councillor June Hitchen, will take place at Manchester City Art Gallery (Mosley Street, M2 3JL) from 18.00 – 19.00.

TICKETS

You will receive a ticket specifically to access this evening reception at registration. Manchester City Art Gallery is a 20-minute walk / 5 minute bus ride from the main conference venue.

CONTACT

Please direct any enquiries to:
Jane Mcdermott (Conference Manager)
j.mcdermott@manchester.ac.uk
(+44) 0161 306 7797
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<tr>
<td>9:30</td>
<td>Registration Opens / Exhibitors</td>
<td>The Drum</td>
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<td>10:30</td>
<td>Conference Welcome &amp; Opening Remarks</td>
<td>Theatre A</td>
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<td>Festival Chairs: Prof Chris Todd, Prof Lorenzo Chiari, Prof Clemens Becker</td>
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<td>10:45</td>
<td>Keynote</td>
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<td></td>
<td>Falls &amp; Cognition: new technologies to engage older people with dementia in falls prevention</td>
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<td></td>
<td>Prof Jacqui Close, NeuRA, Australia</td>
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<td>11:15</td>
<td>Cochrane Update (Plenary)</td>
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<td>Invited Speakers</td>
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<td></td>
<td>Interventions for preventing falls in older people in care facilities and hospitals</td>
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<td></td>
<td>Prof Ngaire Kerse, University of Auckland, New Zealand</td>
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<td>MFFP Multifactorial Interventions</td>
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<td>Prof Sarah Lamb, Oxford Clinical Trials Research Unit, UK</td>
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<td>Selected from Showcase</td>
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<td></td>
<td>Systematic Review with Network Meta-Analysis</td>
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<td>Assoc. Prof Kathryn M. Sibley, University of Manitoba, Canada</td>
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<td>Economic evaluations of falls prevention programmes among older adults: A systematic review</td>
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<td></td>
<td>Dr Branko Olij, University Medical Centre Rotterdam, Netherlands</td>
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<tr>
<td>12:30</td>
<td>Lunch</td>
<td>The Drum</td>
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<td>Exhibitors, Networking, Posters</td>
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<tr>
<td>13:30</td>
<td>Parallel Sessions: Workshops (preselected)</td>
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<td>See Next Page for Details</td>
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<tr>
<td>14:45</td>
<td>The Living Lab &amp; Posters Session</td>
<td>The Drum</td>
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<td></td>
<td>Active demonstrations of a range of novel technologies and interventions for falls prevention best practice in the Drum; light refreshments will be available</td>
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<td>15:00</td>
<td>Parallel Workshop: The FARSEEING Dataset</td>
<td>Theatre A</td>
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<td></td>
<td>Prof Lorenzo Chiari, University of Bologna, Italy &amp; Dr Jochen Klenk, Robert-Bosch-Krankenhaus, Germany</td>
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<td>15:45</td>
<td>Keynote</td>
<td>Theatre A</td>
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<td></td>
<td>NHS RightCare – the power of variation</td>
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<td>Prof Matthew Cripps, NHS RightCare, England, UK</td>
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<td>Falls as a public health issue</td>
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<td>Dr Raymond Jankowski, Public Health England, UK</td>
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<tr>
<td>16:15</td>
<td>The Debate – The Wrong Trousers; Exoskeletons For/Against</td>
<td>Theatre A</td>
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<td>Chair: Prof Feathers McGraw</td>
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<td>Prof Clemens Becker, Robert-Bosch-Krankenhaus, Germany</td>
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<td></td>
<td>Prof Ngaire Kerse, University of Auckland, New Zealand</td>
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<td>17:00</td>
<td>Day One closes</td>
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<td>18:00</td>
<td>Drinks Reception</td>
<td>Manchester Art gallery, Mosley Street (M2 3JL)</td>
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<td>Hosted by The Lord Mayor of the City of Manchester, Councillor June Hitchen</td>
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<tr>
<td>13:30</td>
<td>Monday 2nd July – Parallel Workshops</td>
<td>Location:</td>
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<tr>
<td><strong>Workshop A: Exoskeleton / Prosthetics</strong>&lt;br&gt;Chair: Prof Lorenzo Chiari, University of Bologna, Italy</td>
<td><strong>Room 2.218</strong></td>
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<tr>
<td><strong>Counteracting balance loss by using wearable robotics</strong>&lt;br&gt;Dr Vito Monaco, The BioRobotics Institute of the Scuola Superiore Sant’Anna, Italy <em>(Invited Speaker)</em></td>
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<td><strong>User-centred design of wearable robotics – challenges and opportunities</strong>&lt;br&gt;Dr Valerie Power, University of Limerick, Ireland <em>(Invited Speaker)</em></td>
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<tr>
<th><strong>Workshop B: Lifestyle Integrated Exercise Interventions</strong>&lt;br&gt;Chair: Prof Clemens Becker, Robert-Bosch-Krankenhaus, Germany</th>
<th><strong>Theatre A</strong></th>
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<tr>
<td><strong>Using mHealth technology to support intervention delivery and support behavioural change</strong>&lt;br&gt;Dr Stefanie Mikolaizak, Robert-Bosch-Krankenhaus, Germany &amp; Dr Lis Boulton, University of Manchester, UK <em>(Invited Speakers)</em></td>
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<tr>
<td><strong>Selected from Showcase</strong> &lt;br&gt;<strong>Developing and testing Lifestyle-integrated Functional Exercise interventions delivered by use of ICT or an instructor</strong>&lt;br&gt;Prof Beatrix Vereijken, NTNU, Norway</td>
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<td><strong>Lessons learned from undertaking a feasibility RCT to test Lifestyle-integrated Functional Exercise</strong>&lt;br&gt;Dr Kristin Taraldsen, NTNU, Norway</td>
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<td><strong>Feasibility of the Adapted Lifestyle-integrated Functional Exercise (aLiFE) Programme for older adults in Thailand</strong>&lt;br&gt;Sasiporn Ounjaichon, University of Manchester, UK</td>
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<td><strong>“LiFE goes on”: Translating a proven functional exercise programme (LiFE) for different populations and settings</strong>&lt;br&gt;Dr Michael Schwenk, Robert-Bosch-Krankenhaus, Germany</td>
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<th><strong>Workshop C: Public Health &amp; Epidemiology</strong>&lt;br&gt;Chair: Prof Dawn Skelton, Glasgow Caledonian University, UK</th>
<th><strong>Room 2.220</strong></th>
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<tr>
<td><strong>Prevention - health system / whole system approaches</strong>&lt;br&gt;Daniel McIntyre, Public Health England, UK <em>(Invited Speaker)</em></td>
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<td><strong>Selected from Showcase</strong> &lt;br&gt;<strong>Predicting the onset of functional decline in people aged 65-75 years old: pooled analysis of four European cohort studies</strong>&lt;br&gt;Dr Marco Colpo, Local Health Tuscany Centre, Firenze, Italy</td>
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<td><strong>A Societal Cost-Benefit Analysis of Fall Prevention</strong>&lt;br&gt;Martien Panneman, VeiligheidNL, Netherlands</td>
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<td><strong>Trends in fall-related injury and mortality among older adults in the Netherlands</strong>&lt;br&gt;Dr Branko Olij, University Medical Centre Rotterdam, Netherlands</td>
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<td><strong>Accuracy of screening methods to predict falls in nursing homes: a prospective multi-centre cohort study with six months follow-up</strong>&lt;br&gt;Dr Ellen Vlaeyen, KU Leuven, Belgium</td>
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<td>8:00</td>
<td>Registration Opens / Exhibitors</td>
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<td>9:00</td>
<td>Day 2 Opening &amp; Welcome</td>
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<td>Festival Chairs: Prof Chris Todd, Prof Lorenzo Chiari, Prof Clemens Becker</td>
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<td>9:15</td>
<td>Keynote</td>
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<td>Chair: Jane Mcdermott, Festival Manager, University of Manchester, UK</td>
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<tr>
<td>9:15</td>
<td>Prevention interventions: Asian Perspectives</td>
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<td>Baduanjin ‘qigong’ - Chinese approaches to improve balance and prevent falls amongst older adults</td>
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<td>Dr Leilei Duan, Director Injury Prevention Division, CDC, China</td>
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<td>Focussing on Prevention; the Japanese approach to prevention</td>
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<td>Dr Natasha Curry, Senior Research Fellow, Nuffield Trust, UK</td>
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<tr>
<td>10:15</td>
<td>Implementing Research into Practice (Plenary)</td>
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<td>Chair: Prof Dawn Skelton, Glasgow Caledonian University, UK</td>
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<td>An Implementation toolkit for the Falls Management Exercise (FaME) programme</td>
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<td>Dr Elizabeth Orton, University of Nottingham</td>
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<td>PrefIT Results</td>
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<td>Prof Sarah Lamb, Oxford Clinical Trials Research Unit, UK</td>
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<td>11:00</td>
<td>Refreshments</td>
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<td>14:15</td>
<td>Chief Medical Officer’s (England) Review of Physical Activity</td>
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<td>Chair: Prof Chris Todd, University of Manchester, UK</td>
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<td>Chief Medical Officer’s (England) Review of Physical Activity</td>
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<td>Dr Charlie Foster, Chair of Chief Medical Officer’s (England) Review of Physical Activity, University of Bristol, UK</td>
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<td>14:45</td>
<td>Sarcopenia &amp; Frailty (Plenary)</td>
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<td>Chair: Prof Beatrix Vereijken, NTNU, Norway</td>
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<td>Diagnosing sarcopenia – does it add anything?</td>
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<td>Prof Avan Sayer, National Institute for Health Research, Newcastle Biomedical Research Centre &amp; Prof of Geriatric Medicine, UK</td>
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<td>Frailty, Opportunities and Challenges</td>
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<td>Prof Dawn Skelton, Glasgow Caledonian University, UK</td>
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<tr>
<td>16:00</td>
<td>Closing Address &amp; Festival End</td>
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<td>Festival Chairs: Prof Chris Todd, Prof Lorenzo Chiari, Prof Clemens Becker</td>
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Prevention of falls in older people with visual impairment - the VIP2UK feasibility study  
Prof Heather Waterman, Cardiff University, UK (Invited speaker)

Preventing Falls in Parkinson’s  
Assoc. Prof Vicki Goodwin, (MBE), Exeter University, UK (Invited speaker)

Underwater movement and aquatic therapy for people with Parkinson’s  
Prof Meg Morris, La Trobe University, Australia (Invited speaker)

Selected from Showcase  
FallRiskPD: Assessment of gait pattern as predictors of fall risk in Parkinson’s disease  
Till Gladow, Friedrich-Alexander University Erlangen-Nürnberg, Germany

FallRiskPD: Long-term fall risk classification for Parkinson’s disease via intelligent sensor-based gait analysis in the home environment  
Martin Ullrich, Friedrich-Alexander-University Erlangen-Nürnberg, Germany

A Feasibility Randomised Controlled Trial of the ESCAPE-pain Programme among Patients with Knee Osteoarthritis in Malaysia  
Muhammad Kamil Che Hasan, University of Manchester, UK

Workshop B: Technology & Gaming  
Chair: Prof Stephen Lord, NeuRA, Australia  
Room 2.218

The Together Trial: Using smartphones to support adherence to evidence based strength and balance training  
Dr Helen Hawley-Hague, University of Manchester, UK (Invited speaker)

Selected from showcase  
The development of a gamified digital health application to improve knowledge and influence behaviour to prevent falls, increase exercise levels and improve bone health in older people  
Dr Emma Stanmore & Dr Paul Dewick, University of Manchester, UK

Development of a smartphone application for self-assessment of physical function  
Ronny Bergquist, NTNU, Norway

Cognitive activity as indicated by cortical processing during exergame play  
Dr Nina Skjæret Maroni, NTNU, Norway

The influence of exergame elements on movement characteristics in older adults  
Phillipp Anders, NTNU, Norway

Workshop C: Implementing Falls Prevention in Practice  
Chair: Nicola Wilson, Northern Health Science Alliance, UK  
Theatre A

Selected From Showcase  
Stand Up Stay Up –Taking the rise out of falls  
Ashley Martin, The Royal Society for the Prevention of Accidents, UK

Delivering evidenced falls exercise programmes; FaME (PSI) Instructor skills and evidence based implementation.  
Bex Townley, Later Life Training, UK

Preliminary results of an implementation intervention for fall prevention show improved attitudes, norms, self-efficacy, knowledge and intention in nursing home staff  
Joris Poels, KU Leuven, Belgium

Sub-stratifying needs of frail patients using innovative solutions  
Dr Saif Ahmed, Health Innovation Manchester, UK

East Lancashire Falls Response Service (FRS)  
Rachel Gilmore & Gail Smith, East Lancashire Hospitals NHS Trust, UK

Optimising implementation of a multifactorial approach to prevent falls and improve autonomy in community-dwelling elderly  
Rozan van der Veen, VeiligheidNL, Netherlands
Professor CHRIS TODD

Professor of Primary Care & Community Health in School of Health Sciences at the University of Manchester. Chris is currently work package lead on the PreventIT project.

Professor LORENZO CHIARI

Professor of Rehabilitation Engineering & Biomedical Signal Processing at the University of Bologna, Cesena Campus. He is also the director of the Health Sciences and Technologies - Interdepartmental Center for Industrial Research (HST-ICIR) at the University of Bologna. His main research activity is in the area of ICT for ageing and wellbeing, personal health systems, translational research on neuro-motor assessment and rehabilitation.

Professor CLEMENS BECKER

Head of Clinical Gerontology and Rehabilitation at RBK where he is also Director of the Competence Centre for Clinical Gerontology overseeing 14 research staff. He is currently a work package leader for the PreventIT project.
Dr **Lis Boulton** moved into behaviour change research following a successful career in management in the health and social care sector, working for local government and various charities, as both a service provider and commissioner. As a commissioner, she sought to involve community members in developing services. Her PhD considered the involvement of older adults in designing and implementing interventions to promote physical activity. Lis currently works on the EC PreventIT project, designing and evaluating an App-based behavioural intervention, promoting physical activity in daily life. Lis has a particular interest in the translation of evidence into practice.

Professor **Jacqui Close** is a consultant Geriatrician at the Prince of Wales Hospital in Sydney and Clinical Director of the Falls, Balance and Injury Research Centre at Neuroscience Research Australia. Her primary research area is falls in people with cognitive impairment and dementia and particularly the relationship of cognitive function to postural stability, falls and fractures. She has an interest in the impact of falls and injury to health service use and the way in which health services are designed to prevent and manage falls and injury in older people. She is Co-Chair of the ANZ Hip Fracture Registry, and the Immediate Past-President of the Australian and New Zealand Society for Geriatric Medicine.

Professor **Matthew Cripps** is National Director of NHS RightCare, a national programme of NHS England focusing on population healthcare improvement to deliver the best care to patients, making the NHS’s money go as far as possible and improving patient outcomes by tackling health inequalities. Matthew is a chartered accountant and was an NHS Director of Finance before he moved into change management. Professor Cripps also leads the NHS RightCare Intelligence programme for NHS England, in partnership with Public Health England.
Dr **Natasha Curry** joined the Nuffield Trust in 2011 as a Senior Fellow in Health Policy. Prior to joining the Trust, she worked as a Fellow in Health Policy at the King’s Fund. Natasha has researched and published on a range of topics, including clinical commissioning, integrated care, primary care, risk prediction and NHS reform. She has a particular interest in the management of long-term conditions and the care of older people. She has recently visited Japan to study their long-term care insurance system for older people. Previously, Natasha has worked as a consultant and as an evaluations officer at the Chinese National Healthy Living Centre.

Dr **Leilei Duan** is the Director of the Injury Prevention Division of the National Centre for Chronic and non-communicable disease control and prevention in China. Dr Duan’s major achievements include involvement in the establishment of the National Injury Surveillance System (NISS) in China and leading on the improvement and the expansion of the NISS in 2014, currently the only surveillance system for injury in China working within 252 surveillance hospitals. She has organised two round national injury prevention pilot programmes and is currently delivering the third round 2017 - 2020 which has included 34 provinces and 36 projects focussing on road safety, elderly falls prevention, drowning prevention, and so on.

Dr **Charlie Foster** is a global leader in systematic reviews and meta-analysis of the evidence base for physical activity, with reviews on epidemiology, correlates, interventions and evaluation of natural experiments. With over one hundred research publications including the Lancet, BMJ, and Cochrane Collaboration, he was asked to co-author the 2011 UK Chief Medical Officer physical activity guidelines. Charlie is a leader of physical activity and public health in the UK and was asked to present his research to the UK Parliament’s 2014 All-Party Commission on Physical Activity. He has global policy and advocacy experience working with WHO, EC, and CDC USA.
Dr Vicki Goodwin (MBE) is a community physiotherapist by background and is Associate Professor of Ageing and Rehabilitation at the University of Exeter Medical School. Her research interests are around falls, fractures and frailty and has successfully collaborated in securing around £10 million in research grant funding. She is an Associate Editor for the Physiotherapy journal. In 2015 she was made a Fellow of the CSP for contribution to the development of the profession and services for older people. She was made an MBE in the New Year Honours in 2017 for services to physiotherapy.

Dr Helen Hawley–Hague has worked in the field of Public Health, research, falls prevention and older people for the last 17 years. Helen has work on the FARSEEING Project and ProFouND- The Prevention of Falls Network for Dissemination. She is currently an NIHR Research Fellow and is running a feasibility randomised control trial focused on smartphone technology and delivery of evidence based strength and balance for falls prevention within health services. She is also Co-Applicant on the PreventIT EC project looking at early risk detection and prevention on functional decline using smartphones and smart

Dr Raymond Jankowski is the National Lead for Population Healthcare at Public Health England (PHE) where he leads and on a number of strategic areas including the prevention agenda of STPs, the NHS Rightcare programme and specialised services commissioning. In his role as Director of Public Health for Hertfordshire Dr Jankowski delivered a major falls prevention programme. He was a founding executive member of the National Falls and Fracture Alliance (FFA) and a member of NICE falls prevention Guidelines Development Group. He is currently the senior PHE lead on the National Falls Prevention Coordination Group which published the ‘Falls and fracture consensus statement’ in January 2017. Raymond is currently a member of the National Right Care Oversight Group (RCOG)
Professor **Ngaire Kerse** is a GP Professor and Head of the School of Population Health at the University of Auckland. She runs a programme of gerontological research including falls prevention and health in advanced age. She is recognised as an international expert in interrelated areas of research, and currently leads several research teams, each engaged in a number of research projects.

Professor **Sarah Lamb** works with clinicians from a variety of backgrounds to develop pragmatic clinical trial designs to capture the effectiveness and cost-effectiveness of a variety of health technologies. She is the Chief Investigator for a number of trials of rehabilitation interventions, and Head of the Centre for Rehabilitation Research in the Nuffield Department of Orthopaedics, Rheumatology and Musculo-skeletal Sciences at the University of Oxford. She to working as a Co-Director of OCTRU, Professor Lamb was the Foundation Director of the Warwick Clinical Trials Unit at the University of Warwick. Prof Lamb has served as a member of the American Geriatric Society/ British Geriatric Society Fall Guideline Panel, and more recently, as a member of the NICE guideline panel of hip fracture management.

**Daniel MacIntyre** is based in the national Healthcare Public Health team at Public Health England where he is a national policy / technical lead for falls and fracture prevention and chair of the National Falls Prevention Coordination Group. Daniel led on the production of the ‘Falls and fracture consensus statement’ and associated resource pack and has advised ministers, health economists, and his mum’s yoga group on falls prevention. Daniel has worked in population health roles for the last fifteen years.
Dr Stefanie Mikolaizak is a postdoctoral research fellow at Robert Bosch Krankenhaus (Hospital) in Germany. She is coordinating the German clinical site of a large multi-centre intervention trial (PreventIT). Stefanie is a physiotherapist and holds current registrations in Germany and Australia. She obtained her PhD in public health and community medicine from UNSW Sydney in 2016 is an honorary staff member within the Falls, Balance and Injury Research Centre at NeuRA, Australia. Previous work included coordinating a large multi-disciplinary randomised trial (iPREFER) where Stefanie worked with paramedics, allied health, GPs and geriatricians to offer older fallers follow-up care.

Dr. Vito Monaco is Assistant Professor at The BioRobotics Institute of the Scuola Superiore Sant’Anna (Pisa, Italy), where he leads the Locomotion Biomechanics Laboratory. He received his PhD in “Biorobotics, Science and Engineering” at the IMT Lucca (Lucca, Italy) in 2008 after spending a 6-month period at the Massachusetts Institute of Technology (USA). His main scientific interests concern the effects of aging and neuro-musculo-skeletal diseases on human locomotion and balance control, the design of novel strategies to prevent falling, and the development of robotic platforms for neuro-rehabilitative purposes.

Professor Meg E. Morris is a world leader in falls and movement disorders research and internationally recognised as an expert in exercise and physical activity for older people. Her recommendations regarding movement rehabilitation and falls prevention strategies in older people and Parkinson’s disease have impacted allied health clinical practice world-wide. Professor Morris uses the principles of implementation science to promote evidence based clinical practice for people with movement disorders locally, nationally and internationally, with a focus on falls prevention in hospitals.
Dr Elizabeth Orton is a Consultant in Public Health in Leicestershire County Council and an Associate Professor in Public Health at the University of Nottingham. In the County Council she is responsible for commissioning physical activity programmes targeted at those who are most inactive, and supports the commissioning services for frail older people. In her academic role she is part of the Injury Epidemiology and Prevention Group in the Division of Primary Care. In this role she is the Principal Investigator for the PhISICAL study (Physical activity Implementation Study In Community-dwelling Adults).

Dr Valerie Power is a Postdoctoral Researcher in the Design Factors Research Group, based in the School of Design, Faculty of Science & Engineering, University of Limerick, Ireland. Valerie holds a BSc (Hons) in Physiotherapy from the University of Limerick (2010), and completed her PhD at the same institution in 2014, examining the clinical application of wearable inertial sensors to assess gait, balance and fall-risk among community-dwelling older adults. Valerie’s current research interests include user-centred design of wearable assistive technologies, and the application of human movement sciences in exoskeleton design.

Professor Avan Sayer is the Director of the NIHR Newcastle Biomedical Research Centre, an NIHR Senior Investigator, and Professor of Geriatric Medicine at Newcastle University. She is also an Honorary Consultant in Geriatric Medicine at the Newcastle upon Tyne Hospitals NHS Foundation Trust. She leads an internationally recognised research programme on sarcopenia and frailty with particular focus on how to translate understanding about mechanisms into improved diagnosis, treatment and prevention across the life course.
Professor **Dawn Skelton** is an exercise physiologist with a scientific research background. She is Professor in Ageing and Health at Glasgow Caledonian University. She currently chairs a review on guidelines for exercise for the UKs National Osteoporosis Society and the Older People panel for the UK’s update of the Physical Activity for Health Guidelines. She is a Director of Later Life Training Ltd, a not-for profit company, which trains health and fitness professionals to work with effective physical activity and exercise with older people and stroke survivors. Later Life Training ran Cascade Training in the Otago programme within the Prevention of Falls Network for Dissemination (ProFouND) project.

Professor **Heather Waterman** is a Professor of Nursing and Ophthalmology, former Dean and Head of School of Healthcare Sciences, Cardiff University, is a health services researcher with 25 years experience, over 60 publications and PGR supervision experience (18 PhD/MPhil completions). Coming with a clinical background of ophthalmic nursing, she has research interests in promoting self-care of patients with long term conditions especially those concerning loss of sight. Her methodological expertise lies in action research with a current focus on translating research into practice.

**Nicki Wilson** originally trained in mental health and psychological interventions and is a qualified CBT practitioner. In 2016, Nicki was recruited by the Northern Health Science Alliance (NHSA) to apply her experience and expertise in building pan-regional collaborations, research partnerships and operational management, leading to her appointment as their full-time Chief of Staff in September 2017. Within her remit Nicki is responsible for leading the NHSA’s ageing health activity and coordination of the ‘Active and Healthy Ageing North’ network, created to maximise on the existing pan-regional expertise in older adults’ health and to collectively tackle common challenges of a rapidly expanding ageing demographic.
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Sub-stratifying needs of frail patients using innovative solutions

Farah Irfan-Khan, Dr Dai Roberts, Dr Saif Ahmed
Health Innovation Manchester

Providing better care and support for people living with frailty is both a key challenge and opportunity for the NHS, as recognised in the NHS Five Year Forward View and is also one of the initiatives of the Tameside and Glossop Care Together Transformation Programme.

The development of Integrated Neighbourhood Teams is one of the initiatives of the Tameside & Glossop Care Together Transformation Programme with a specific focus on Frailty. The Dunkinfield, Mossley and Stalybridge Neighbourhood Frailty MDT has been set up as vehicle to support the identification, review and management of severely frail patients using IT toolkits and systems. It has been designed to meet the new frailty requirements in the 2017/18 GP contract with routine frailty identification and management of patients who are 65 and over from 1 July 2017 using the electronic Frailty Index calculator. Patients are then sub-stratified using the Falls Risk Assessment Toolkit (FRAT) developed by Keele University and Fracture Risk Assessment Tool (FRAX) developed by University of Sheffield.

The MDT is led by the practice GP and involves several health and care practitioners from various organisations including adult social care, district nursing, Community Response Service, physiotherapy, integrated urgent care teams, as well as others.

The MDT, launched on 31 January 2018, rotates across the Neighbourhood. The MDT reviews severely frail patients from each practice with the view to improve the journey and experience for patients by considering a range of interventions and facilitating successful integrated care planning suited to their needs.

The overall aim is to ensure standardised care for people with frailty, prevent frailty progression and poor outcomes and reduce non-elective admissions to hospitals related to falls and fractures and frailty related attendances at GP practices. Eservice modelling and emerging data on case finding and interventions referred to will be presented.
The influence of exergame elements on movement characteristics in older adults

Phillipp Anders, Espen Ingvald Bengtson, Karoline Blix Grønvik, Nina Skjæret-Maroni, Beatrix Vereijken
Norwegian University of Science and Technology

Background

Exergames are increasingly used to train balance and executive functions in older adults. However, there is sparse knowledge regarding how game characteristics affect how older adults play exergames. In the current study, we investigated how speed of exergaming and the presence of obstacles to be avoided influenced movement characteristics.

Methods

Fifteen participants (74 ± 4.4 yrs.) played a step-based exergame (“The Fox” from Silverfit BV, NL) for eight trials with and without obstacles in two speed settings, in counterbalanced order. The task consisted of catching grapes by moving sideways and chickens by raising the arms, while avoiding falling branches if present. A 3D-motion capture system (Oqus, Qualisys, SE) was used to capture 19 reflective markers fixed to upper and lower body. Calculated variables included step length, step frequency, single leg support, arm lift frequency, and elbow angle. The effect of speed, obstacles and trial repetition on the variables were tested using 3-way repeated measures ANOVAs.

Results

Preliminary analyses revealed a significant effect of game speed (p = .009) and obstacles (p<.001) on step frequency, with no effect of trial repetition (p = .364). Step frequency increased in the faster game, but decreased when obstacles were present. The number of arm lifts significantly decreased with increased game speed (p = .036) and trial (p = .048) but were not affected by obstacles (p = .152). Neither speed (p = .738) nor obstacles (p = .594) affected average step length. However, average step length significantly increased with trial repetition (p = .01).

Conclusion

Both game speed and the presence of obstacles influence players’ movement characteristics. In order to achieve the desired movements relevant for exercise or rehabilitation, game characteristics such as exergame speed and cognitive elements such as objects to be avoided need to be taken into account.
Development of a smartphone application for self-assessment of physical function

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\textsuperscript{1}Norwegian University of Science and Technology, \textsuperscript{2}University of Bologna

Background

Instrumented Timed Up and Go (TUG) and timed Standing Tandem (ST) provide more information about test performance than traditional versions. A self-test application (app) makes it possible for people to assess their performance by using a smartphone. The aim of this ongoing project is to develop and assess the usability of a self-test app of TUG and ST in older adults.

Method

As part of the PreventIT-study, home-dwelling, young seniors (60-70 years old) performed the TUG and ST (eyes closed, 15 sec duration), using a prototype self-test app on a smartphone and a sheet of written instructions, without any assistance. In this first step of the development process, we observed the proportion of participants able/not able to perform the tests correctly, and the number and type of errors.

Results

Of a total of 189 participants (66.3 ± 2.5 years), 42 (22\%) and 107 (57\%) participants were able to self-administer TUG and ST, respectively. Only 52 participants were able to keep the ST position for 15 seconds. Common sources of errors were ‘hesitation during the task’, ‘failed or forgot to start the test in the app’, and ‘got up from the chair before start signal’ for TUG, and ‘failed to initiate correct starting position’ and ‘did not close eyes’ for ST.

Conclusions

Based on these results from the first prototype versions, we have included instructional videos in both apps, changed the smartphone placement in TUG, and changed the ST to an ‘open eyes’-version. The next step is to evaluate the new versions with simultaneous recording of movement with a second smartphone attached to the participants back. We will evaluate usability aspects in focus groups with the end-users to learn more about their needs and preferences.
Predicting the onset of functional decline in people aged 65-75 years old: pooled analysis of four European cohort studies

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¹Vrije Universiteit Amsterdam, ²LHTC Local Health Tuscany Center, ³Ulm University, ⁴University of Manchester, ⁵University of Bologna, ⁶Norwegian University of Science and Technology, ⁷University of Melbourne

Background

Identifying people at risk of early functional decline in activities of daily living (ADL) is essential for initiating targeted preventive interventions. The aim of this study is to develop and validate a prediction model for the onset of functional decline in three-year follow-up in young older adults aged 65-75 years.

Methods

We conducted a pooled analysis of four population-based cohorts, including participants of 65-75 years old who reported no functional limitations at baseline. Functional decline was assessed with two items on basic ADL and three items on instrumental ADL. Participants who reported at least some limitations at three-year follow-up on any of the five items were classified as experiencing functional decline. Potential predictors were socio-demographic, behavioral, physical, and clinical variables, including easy-to-measure physical performance measures. Multiple logistic regression analysis was used to develop a prediction model, with subsequent bootstrapping for optimism-correction. We applied internal-external cross-validation to assess model discrimination and calibration across the cohorts.

Results

2560 people were included (mean age 69.7±3.0 years, 47.4% female) of whom 572 (22.3%) reported functional decline at three-year follow-up. The final prediction model contained 10 out of 22 predictors: age, handgrip strength, gait speed, five-repeated chair stands time (non-linear association), body mass index, cardiovascular disease, diabetes, chronic obstructive pulmonary disease, arthritis, and depressive symptoms. The optimism-corrected model showed good discrimination with a C statistic of 0.72. Calibration intercept was 0.06 and calibration slope was 1.05. Internal-external cross-validation showed consistent performance of the model across the four cohorts.

Conclusions

Based on pooled cohort data analyses we showed that the onset of functional decline in ADL in three years in people aged 65-75 years can be predicted by specific physical performance measures, age, body mass index, depressive symptoms, and chronic conditions.
The Falls Response Service (FRS) is collaboration between an acute occupational therapy and an ambulance service. The primary aim is to rapidly assess patients in their own homes to avoid conveyance to hospital. The combined skills of the clinicians have proved to be successful in keeping people out of hospital. Working out of Burnley Ambulance station, FRS respond to 999/111 calls triaged by the North West Ambulance Service (NWAS) control as low risk – falls with no apparent injury. The service aims to reduce unnecessary hospital admission due to social or non-medical factors, reduce the number of older people presenting at A&E following a fall, and reduce demand for Paramedic Emergency Service.

FRS is one Paramedic and one Occupational Therapist and operates from an unmarked car, freeing up the ambulance. The car is equipped with basic paramedic kit, manual handling and therapy equipment. The response to every incident is led by the Paramedic assessment which followed the NWAS Pathfinder tool. The therapy assessment only begins when the patient is deemed to have satisfactory observations and no injury. Together the team review balance, mobility and muscle weakness, evidence of UTI or chest infection, indicators of visual or cognitive impairment. The Therapist reviews the person’s functional ability and fear of falling. Intervention primarily includes review of the person’s functional ability, advice on falls prevention, provision of equipment and liaison with community services.

There are a number of financial benefits that can be attributed to FRS, these are around the reduced costs of the paramedic emergency conveyance, and being treated in the emergency department along with the additional costs in the patient is subsequently admitted to hospital. Since the start of the service in January 2015, the service has been able to retain over 70% of cases that they pick up at home, rather that 70% be taken to hospital which was the situation prior to the commencement of the service.
FallRiskPD: Assessment of gait pattern as predictors of fall risk in Parkinson's disease

Friedrich-Alexander-Universität

Background

Recurrent falls are a major problem for numerous people with Parkinson’s disease (PD). Frequency of falls (FoF) ranges from once a year to several times per day. A reliable fall risk prediction under daily living conditions can enhance clinical decisions; prevent fall events; and increases patients’ quality of life. Therefore, the goal of this project is to develop a continuous long-term monitoring system that is able to identify disease specific changes of gait in order to determine the fall risk of PD patients.

Method

Fall events and gait parameters of a PD cohort were routinely recorded during clinical visits. The Erlanger FoF-Questionnaire classifies patients into daily, weekly, quarterly and yearly fallers. Gait parameters were captured by a mobile gait analysis system while patients performed a standardized 4x10-Meter-Test and the 2-Minute-Walking-Test. Group differences between the frequency of falls in the last year and spatiotemporal gait parameters (e.g. stride length, stride time) were analyzed.

Results

In our presentation we will demonstrate preliminary results of pilot data from 101 PD patients. This includes the variation in gait patterns from fallers with diverse frequencies of fall events per year (n=38) and non-fallers (n=63). Furthermore, we will compare effects on short walking bouts with longer walking bouts segmented from the standardized gait tests (4x10-Meter and 2-Minute-Walk).

Conclusions

Instrumented gait analysis in short and long walking bouts substantially supports the understanding of gait and balance difficulties in frequent PD fallers. Validation of gait parameters and patterns from at-home monitoring concepts as targets predicting the individual fall risk will support clinical decision making and complement precision medicine approaches in digital health.
A Feasibility Randomised Controlled Trial of ESCAPE-pain Programme among Patients with Knee Osteoarthritis in Malaysia

Muhammad Kamil Che Hasan¹, Emma Stanmore², Chris Todd²

1International Islamic University Malaysia, 2The University of Manchester.

Background

In Malaysia, around one in ten older people are diagnosed with osteoarthritis (OA). The most common form is knee OA. This can lead to functional limitations, impaired activities of daily living, reduced quality-of-life and increased risk of falls. Our systematic review of the literature concludes that a programme integrating exercise, education and active coping strategies (Enabling Self-management and Coping with Arthritic Pain using Exercise (ESCAPE-pain)) provides the best evidence for implementation. Thus, this study aims to evaluate the feasibility of ESCAPE-pain programme among patients with knee OA in Malaysian healthcare context.

Method

A pragmatic feasibility randomised controlled trial was conducted recruiting from two hospitals in Malaysia. OA knee patients were randomised to ESCAPE-pain intervention (n=36) or control (n=36) groups using an independent online randomisation service (www.sealedenvelope.com). Outcomes were measured for physical function (TUG), knee injury and osteoarthritis outcome scores (KOOS), mental wellbeing (Short-WEMWBS), exercise health beliefs (ExBeliefs) and fear of falling (Short-FES-I) at baseline, six-week and after 12-week of intervention.

Results

Attendance at ≥10 out of 12 sessions was 82.4%. Retention rate at 12-week was 87.5% (63/72). Repeated measures MANOVA shows that no significant changes (p>0.05) for TUG or KOOS between intervention and control groups. However, better outcomes (p<0.05) were reported for health belief, mental wellbeing, and fear of falling efficacy among patients in intervention group.

Conclusions

The findings of this study indicate that the ESCAPE-pain programme may be feasible for patients with knee OA in Malaysia. As a feasibility study this is not powered to detect significant differences on primary KOOS outcomes, nonetheless participants reported positive views towards exercise with significant improvements in belief in performing activities, and reduced fear of falling.
Cognitive activity as indicated by cortical processing during exergame play

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1Norwegian University of Science and Technology, 2Paderborn University

Background

Exergames are progressively used to increase physical activity and may offer a novel strategy to improve cognitive functioning. However, there is limited knowledge whether exergames inherently require cortical processing and whether there are differences in demands for young and older adults. The current aims were to assess whether electrophysiological measurements during exergaming are feasible and if so, whether cortical activity changes with additional cognitive elements and age.

Methods

Two studies were performed. In study 1, 24 young adults (24.6 ± 2.1 yrs.) performed self-paced sideways leaning movements, followed by a puzzle exergame at two difficulty levels in which participants leaned left or right to select the correct piece. Brain activity was recorded using a 64-channel passive EEG system. In study 2, 16 young (25 ± 2.1 yrs.) and 16 older (76.5 ± 4.5 yrs.) adults played a step-based exergame on three difficulty levels. Brain activity was recorded with a 64-channel active EEG system.

Results

Results in study 1 indicated that it is feasible to record brain activity in young adults while playing exergames. This was supported by study 2 that showed that it is also feasible to record brain activity in older adults, even during a more vigorous exergame. The first study identified five spatially clusters located frontal, bilateral central, and bilateral parietal. With increasing cognitive demands from self-paced to the two exergame conditions, the frontal cluster showed a significant increase in absolute theta power while both central clusters showed a significant increase in absolute alpha-2 power. Preliminary results in study 2 also show a difference between difficulty levels as well as a difference in cognitive activity between young and older adults. Final results will be presented at the EU Falls Festival.

Conclusions

Exergames inherently require cognitive processing, and cognitive demands change with game, difficulty level, and age.
Local falls prevention requires a multi-faceted approach involving a range of professions within the NHS working alongside local authorities, public health, housing agencies, exercise professionals, third sector organisations, the fire service and others. The Stand Up Stay Up programme is working with 10 local partner areas across England to put falls prevention at the heart of strategic development as a key to delivering long-term change. Each area is also delivering a community intervention designed to test and disseminate best practice. Early results will be presented from these initiatives, which include;

- Raising awareness in the local community with “the pop-up assessor” – (Blackburn-with-Darwen)
- The use of QTUG in a variety of settings to measure progress in strength and balance (Sandwell, Birmingham, Southend)
- Using video as a launch pad for bringing together community exercise groups and increasing strength and balance provision (Brighton)
- Using libraries and leisure services to increase opportunities for falls prevention (Birmingham and Bristol)
- Improving homes to reduce falls and developing countywide strategic approaches (Northamptonshire, Cumbria)

As well as the local partners, over 300 organisations and individuals have registered to join a national network which gives access to newsletters, links, web resources about best practice, learning exchange events and discounts on home safety training.

City and Guilds accredited Older People Home Safety training has been delivered to staff or volunteers who have day to day contact with older people or their families to increase the number and range of people with the skills and knowledge to recognise the main risk factors for falls and provide advice and support. Evidence will be presented on the impact of the training in improving practice.

The presentation will include findings from the interim independent evaluation.

The programme supports the work of the National Falls Prevention Co-ordination Group of which RoSPA is a member.
Background

Falls among older adults have a large impact on their health. We aim to provide a comprehensive overview of economic evaluations of falls prevention programs and to evaluate the methodology and quality of these studies.

Method

We performed a systematic review of economic evaluations on adults aged 60 years and older. Clinical and health-economic databases were systematically searched. We included studies on community-dwelling older adults and on older adults living in residential care facilities, published until April 2017. Study characteristics and health economic data were collected. The study quality was appraised using the Consensus on Health Economic Criteria consisting of 20 items.

Results

Economic evaluations of falls prevention through exercise (n=9), home assessment (n=6), medication adjustment (n=4), multifactorial programs (n=11), and various other programs (n=13) were identified. The majority of the falls prevention programs, both for community-dwelling older adults and for older adults living in residential care facilities, were cost-effective. About two-thirds of all reported incremental cost-effectiveness ratios (ICERs) with quality adjusted life-years (QALYs) as outcome were below the willingness-to-pay threshold of $50,000 per QALY. All studies on home assessment and medication adjustment programs reported favorable ICERs, whereas the results of studies on exercise and multifactorial programs were inconsistent. The methodological quality of the studies was good, although variation existed between studies.

Conclusions

The majority of the ICERs indicated that falls prevention programs were cost-effective, but direct comparison of the cost-effectiveness between program types was hampered by methodological differences between studies. Our results imply that investing in falls prevention programs for older adults aged 60 years and older is worthwhile. This particularly applies to medication adjustment programs (ICERs <$13,000 per QALY) and home assessment programs (ICERs <$40,000 per QALY).
Trends in fall-related injury and mortality among older adults in the Netherlands

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Background

Fall-related injuries are a large cause of societal burden of injury among older adults. This burden is influenced by demographic changes and trends in the epidemiology of injuries.

Method

Trends over time of fall-related ED visits, hospital admissions, and mortality of adults aged 65 years and older were extracted from the Dutch Injury Surveillance System, Dutch Hospital Discharge Registry, and Statistics Netherlands, from 1997 through 2016. Outcome measures in each year of the study were: the absolute numbers and age-standardized rates in men and women of fall-related ED visits; hospital admissions; and mortality.

Results

Between 1997 and 2016, the number of fall-related ED visits increased by 48% to 96,186, and hospital admissions increased by 59% to 40,012. On the contrary, the age-standardized incidence rates of ED visits decreased over time by 30% and hospital admissions decreased by 23%. Furthermore, in-hospital length of stay reduced from 18.6 days (1997) to 6.6 days (2016). During the same period, the absolute number of fatal falls increased by 168%, whereas the age-standardized mortality rate increased by 13%.

Conclusions

Due to an ageing population, the absolute burden of fall-related injuries to society has largely increased over the past 20 years. Epidemiological trends in ED visits and hospital admissions have nevertheless been positive in the same period. However, age-standardized mortality rates have increased over time, which should be further explored in future studies.
Background

Falls are the leading cause of injuries in older adults in Thailand. There is a need to develop a fall prevention exercise programme to encourage their participation and adherence. The adapted Lifestyle-integrated Functional Exercise (aLiFE) programme, adapted by PreventIT from the original LiFE programme, may be suitable by integrating exercise into daily routines. This study aims to explore the acceptability and feasibility of the aLiFE programme in older Thai adults and identify if any modification is necessary for this population.

Method

To obtain older Thai adults' perspectives and stakeholders' views, 40 adults aged ≥ 60 years living in the community in urban and rural locations in Thailand and 14 stakeholders (e.g. healthcare professionals) working with older Thai adults were recruited. Qualitative methods were used to conduct focus groups and in-depth interviews among older adults, and semi-structured interviews among stakeholders. Interviews and focus groups were transcribed verbatim in Thai. Thematic analyses using Framework Approach were conducted.

Results

Findings identify four themes including: (a) individual, (b) perceptions of aLiFE, (c) recommendations for implementing aLiFE in Thailand, and (d) motivation. Older participants expressed interest in trying aLiFE and performing aLiFE in their daily activities, although some activities may need to be modified to fit Thai cultural context. Many stakeholders were concerned about how to motivate older Thai adults to adhere to aLiFE. Healthcare professionals and family members could play a major role to support older adults in uptake of aLiFE. Benefits (e.g. independence and fall prevention) may motivate older participants to engage in aLiFE. Clear and simple instructions were requested.

Conclusions

The aLiFE programme should be feasible and acceptable in older Thai adults. The modification of aLiFE will be appropriately made and a feasibility randomised controlled trial of the “TLiFE” programme for older adults in Thailand will be planned.
A societal cost-benefit analysis of fall prevention

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Background

Ageing societies will be confronted with increasing numbers of elderly citizens experiencing fall related injuries. Preventive measures can be beneficial in reducing the fall related health care burden of these elderly people. Fall prevention interventions entail costs for sectors in society that differ from those receiving the benefits. We performed a social cost-benefit analysis (SCBA) to calculate the balance between investments and potential benefits of fall prevention in the Netherlands.

Methods

In a SCBA, costs and benefits of societal domains affected by the interventions were identified, making explicit which stakeholder pays and who benefits. Five policy scenarios for fall prevention in the elderly were developed: primary care, home care, informal caregiver, neighborhood, and integral. The SCBA model include all costs of tracking, screening and recruiting participants according to each scenario and intervention costs with the benefits of the intervention program, i.e. savings in injury related care expenses.

Results

Structural implementation of fall prevention among the elderly results in significant health benefits, combined with net cost savings for all policy scenarios. The net benefits per 100,000 senior citizens range from €2.8 million for the informal caregiver scenario to €16.6 million for the home care scenario. The benefits equal respectively €700-950 per fall prevented. Depending on the policy scenario, almost half of the savings are seen at health care insurance, 35% at the Long-term care Act and approximately 10% at municipal support.

Conclusions

Structural implementation of evidence-based falls prevention can lead to considerable health benefits, combined with net cost savings. Since the balance of total costs and benefits is positive, this will lend support to implementation of fall prevention at the societal level. The SCBA provides guidance to policy makers on the most optimal fall prevention programs in the elderly to reduce the disease burden of injury related falls in the Netherlands.
Preliminary results of an implementation intervention for fall prevention show increased attitudes, norms, self-efficacy, knowledge and intention in nursing home staff

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Background

Implementing fall prevention requires more than solely disseminating clinical practice guidelines (CPG). A multifaceted approach, tailored to the local context, is indispensable. This study intended to implement a CPG for fall prevention in nursing homes using a structured implementation plan.

Method

We conducted a multicenter pre-post study in six nursing homes. Each nursing home committed to implement the CPG by following a twelve-step implementation plan. Data on attitude, norms, self-efficacy, knowledge and intention were collected using structured questionnaires at baseline and after a follow-up of a minimum of 11 months.

Attitude (i.e. general evaluation of the subject with regard to the implementation of fall prevention), norms (i.e. social pressure to apply fall prevention or not as perceived by the subject), self-efficacy (i.e. degree to which the subject feels able to apply fall prevention) and intention (i.e. a conscious plan to make the effort to apply fall prevention) were measured using 7, 5, 3 and 1 items on a 7-point likert-scale respectively.

Knowledge (i.e., understanding of the concept of a fall and fall prevention) was measured using 16 true-false questions.

Results

In comparison with data collected at baseline, mean scores on attitude (PRE: 5.10 ±1.77 – POST: 5.95 ±0.78; p=0.00), norms (PRE: 4.44 ±1.39 – POST: 5.11 ±1.07; p=0.00), self-efficacy (PRE: 4.72 ±1.30 – POST: 5.18 ±1.12; p<0.01), knowledge (PRE: 11.19 ±2.61 – POST: 13.24 ±1.76; p=0.00) and intention (PRE: 5.67 ± 1.41 – POST: 5.98 ±1.07; p=0.03) towards fall prevention increased significantly in nursing home staff (n=110) during the implementation process.

Conclusions

Preliminary results suggest an improvement in attitude, norms, self-efficacy, knowledge and intention towards fall prevention in nursing home staff during the implementation process.
“LiFE goes on”: Translating a proven functional exercise program (LiFE) for different populations and settings


Background

The Lifestyle-integrated Functional Exercise (LiFE) is an innovative and non-traditional exercise program developed for at risk people 75 years and older by Clemson et al. (BMJ 2012;345:e4547). The current contribution will present research findings from an European project (PreventIT) and a German project (LiFE-is-LiFE) which translated the LiFE concept for different target populations and settings.

Method

The PreventIT project has adapted LiFE (aLiFE) for a younger cohort at age of 60-70 years and evaluated the feasibility within a multi-center pilot study in 30 participants. The LiFE-is-LiFE project has translated the individually delivered LiFE programme to a group LiFE (gLiFE) format. Feasibility of gLiFE has been evaluated within a pilot study in 6 participants aged 70 years and older. Feasibility measures in both pilot studies were adherence, reported helpfulness for improving strength, balance, and physical activity; safety; level of difficulty; adaptability to personal lifestyle, and adverse events. Pre to post changes in balance and mobility were also measures.

Results

PreventIT: All except of one participant completed the study. On average, participants implemented 12.1 ± 1.8 activities during the intervention. Sit to stand, stair climbing, one-leg stand, and stepping over objects were most frequently implemented. Single activities were practiced between 3.6 – 6.1 days/week and between 1.8 – 7.8 times/day. Overall acceptability of aLiFE was high (median score 6 out of 7). The majority of participants found the activities helpful, safe, appropriately difficult, and adaptable to individual lifestyle. Balance and mobility performance improved by 6.7% (P=0.001).

LiFE is LiFE: All participants completed the study and overall acceptability of the programme was high.

Conclusion

LiFE was successfully translated to 1) a younger target population and 2) a group mode which allows cost-efficient large scale implementation. aLiFE and gLiFE are currently fully evaluated in larger RCT studies within the PreventIT and LiFE-is-LiFE project.
Comparative Effectiveness of Exercise Interventions for Preventing Falls in Older Adults: A Systematic Review with Network Meta-Analysis

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Background

Although meta-analysis has demonstrated that exercise reduces falls, the most effective types of exercise (modes of exercise that target specific biological systems and/or functions) are not clear. Network meta-analysis (NMA) compares multiple interventions thereby facilitating interpretation of a complex body of evidence. The goal of this study was to determine comparative effectiveness of exercise types for fall prevention exercise using NMA.

Method

A systematic review with pairwise meta-analysis and NMA was conducted. MEDLINE, EMBASE, Cochrane Central Register of Controlled Trials, and Ageline databases were searched from inception until April 2017. All studies describing fall prevention exercise interventions for adults aged 65 years and over were included. Exercise interventions were coded using a framework of 25 exercise types informed by a taxonomy of exercise interventions, components of balance, and exercise types included in existing systematic reviews. Comparators included other types of exercise or no exercise. Primary outcomes were number of fallers and injurious falls. Two investigators screened titles and abstracts, full-text articles, extracted data and appraised risk of bias independently.

Results

A total of 171 studies were included after screening 10650 records and 1210 full text manuscripts. The most common types of exercise included in the review were supervised multifactorial exercise (7 studies), tai chi incorporating anticipatory and dynamic balance (3 studies). NMA was conducted including 59 studies (21610 participants, 57 exercise interventions) for number of fallers. 64 exercise interventions were associated with significant reductions in the number of fallers. NMA was conducted with 23 studies (9528 participants, 26 exercise interventions) for injurious falls. 56 exercise interventions were associated with significant reductions in the number of fallers.

Conclusion

Many combinations of exercise reduce number of fallers and injurious falls. Ongoing analysis is exploring trends and common elements of significance in effective exercise types for fall prevention.
The development of a gamified digital health application to improve knowledge and influence behaviour to prevent falls, increase exercise levels and improve bone health in older people.

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The University of Manchester

Background

The use of gamification (using ‘game elements’ to engage and motivate people in non-game contexts) and digital technology to promote healthy behaviour presents an opportunity to influence positive lifestyle change to extend healthy life years for older people. The aim of this project was to design, develop and user test a tablet-based application to engage, educate, and motivate older people to undertake strength and balance exercises, modify home hazards to prevent falls and influence dietary intake to promote bone health. To inform the development of the application we integrated research evidence and theory, software design, game mechanics, health behavioural insights and user perspectives. We formed a multi-disciplinary team of clinical and academic researchers, digital designers, older users from assistive living facilities and health professionals from 2 falls prevention teams to develop and test a tablet-based application for older people.

Method

Focus groups, incorporating individual user testing, were undertaken with 65 residents in assistive living facilities in Greater Manchester and Nottingham, UK. These explored the acceptability and usability of the app. Transcripts were analysed using thematic analysis and resultant themes were fed back to the software developers to enable improvements to the interface design, navigation and terminology and ensure the application was acceptable and usable. Messages that focus on independence rather than falls prevention were preferred and the need for personalisation was reported due to the co-morbidities, pain and sensory impairments affecting many of the participants.

Results

The interactive, gamified elements and aesthetic design of the app were viewed positively by the participants and the preference to use the app in a social context was a notably strong theme.

Conclusions

This work presents an inexpensive, healthy ageing application that may be feasible for widespread public health use and may have wider utility for the development of other digital health applications to promote positive behavioural change and independence in older people.
PreventIT: Use of a smartphone+watch system in a lifestyle-integrated exercise intervention

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Background

The PreventIT project adapted an existing lifestyle-integrated exercise programme to young seniors, and delivered this intervention through a mobile health (mHealth) system based on smartphone and smartwatch. The aim of this sub-study was to assess use of the mHealth system through data gathered from the smartphones, smartwatches and focus groups.

Methods

A multi-centre, three-armed feasibility randomised controlled trial (RCT) was run in Trondheim, Amsterdam, and Stuttgart. Using draws from local registries, followed by a screening and a baseline assessment, 180 persons aged 61-70 were randomised to the ICT-intervention, the same intervention based on paper manuals, or to a control group, with testing at baseline, 6 months, and 12 months. At 6 months, focus groups were held with each of the intervention arms and instructors. Data on use of the apps were stored on a server and used for analysis.

Results

In total 60 persons (30 females) were introduced to the mHealth system. Preliminary analyses of the app-data revealed that six participants stopped using the system within the first 50 days. After three and six months, 87% and 58% of the participants were still using the system, respectively. The most performed activities included one leg stand (42 participants), lunges (37 participants), and rising from a chair (36 participants). Nineteen persons participated in the eLiFE focus groups. Overall, they were positive about the intervention and many had changed daily routines to a more active lifestyle.

Conclusions

Preliminary results indicate that the intervention was feasible, well received, and changed participants’ daily habits. Feedback from the eLiFE participants suggests that the app might have been most important in the beginning to change to a more active lifestyle. Results from the ongoing feasibility RCT will provide additional information about how people used the system and to what extent habits and physical function were affected.
Masterclass: delivering evidenced falls exercise programmes; FaME (PSI) Instructor skills and evidence based implementation.

Bex Townley, Dawn Skelton

Background

The FaME programme is evidenced to reduce falls, improve self efficacy and balance and increase moderate physical activity levels by 15 mins/day in older people. Across the UK over 3000 instructors (physiotherapists and specialist exercise instructors) have been trained to deliver this programme. Public Health England identified FaME as a cost effective programme and have recently published a ‘Return On Investment’ tool that further promotes the implementation of FaME and so the demand for this programme increases. However, from our (LLT) experiences of 13 years, commissioners are lacking the understanding of why post graduate level training, associated training and assessment is required for the delivery of this programme. This session will demonstrate first hand the exercise tailoring skills, knowledge and management strategies required to deliver an effective, safe, enjoyable and motivating evidence based falls prevention session (FaME).

Methods

Practical based masterclass teaching the seven evidence based activities of the FaME programme to a group of delegates. We will highlight key considerations and progressions across the 6-9 month duration of the evidence based programme (skilling up, training gains, maintaining gains).

Results

By the end of this practical masterclass observing delegate’s/participants will be able to experience, observe and analyse what is required to lead an evidence based exercise programme to reduce falls.

FallRiskPD: Long-term fall risk classification for Parkinson’s disease via intelligent sensor-based gait analysis in the home environment

Friedrich-Alexander-Universität

Background

Increased fall risk is a key symptom in Parkinson’s disease (PD), where falls are a leading cause of injuries for patients. So far, no validated technical gait monitoring system exists to identify the individual’s fall risk prospectively. The goal of this project is the development of a system, that is able to identify disease specific changes of gait, in order to determine the fall risk of PD patients.

Method

Gait patterns of PD patients will be captured by shoe integrated inertial sensors. Two clinical trial phases will both contain several weeks of continuous unsupervised home monitoring, as well as a recording of the patients’ frequency of falls in a follow-up visit. In a preprocessing step, bouts of continuous gait will be extracted using signal processing techniques, such as frequency analysis. After a segmentation of single strides, relevant gait parameters will be computed. These will serve as input for machine learning algorithms to classify patients regarding their fall risk. Data from the first phase will be analyzed to determine the individual fall risk retrospectively. The system will be validated in the second phase by means of a prospective fall risk classification.

Results

The proposed system will allow the assignment of patients to one class on the following four-scaled grading of fall risk: (I) Minor Fall Risk; (II) Increased Fall Risk; (III) Assured Fall Risk; (IV) Permanent Fall Risk. In our presentation we will show preliminary results of pilot data from 87 patients to demonstrate how sensor based measurements of gait parameters serve for machine learning based fall risk prediction.

Conclusions

Further research is needed in fall risk analysis of PD patients, especially in ambulatory and at home settings. This project will contribute methods for signal analysis, machine learning and big data analytics to this important research field.
TOM: optimizing implementation of a multifactorial approach to prevent falls and improve autonomy in community-dwelling elderly

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Background

The first fall of an older person is a critical starting point of a cascade of events that can lead to injury, inactivity, social isolation, more falls and institutionalization. In a time where the focus of healthcare policy has shifted to prevention, self-sustainability and independence, the need for a local and multifactorial approach is growing. TOM is a multifactorial intervention program aimed at stabilizing and improving the mobility of people aged 65 and over in order to sustain autonomy and independent living.

Method

TOM will be implemented in four living labs between April 2017 and December 2018, each consisting of 30 to 60 community-dwelling older people aged 65 and over and with an increased risk of falling. Participants follow a 14-week evidence-based exercise program and receive weekly social support, nutritional advice and, in case of (risk of) malnutrition, nutritional support. At the end of each living lab, acceptability and feasibility data are collected by focus groups with participants and healthcare professionals. The results of each living lab are used to optimize the implementation of TOM in the following.

Results

Participants of the first living lab were positive about the various elements of the program, such as the exercise program, the personal feedback of the mobility monitor and the involvement of the mailmen and the senior council. Their recommendations included more flexible adaptation of frequency of contact moments and more general information about nutrition. These adaptations are tested in the second living lab.
PreventIT: Developing and testing lifestyle-integrated exercise interventions delivered by use of ICT or an instructor

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Background

Balance, strength, and physical activity are important for healthy ageing and preventing age-related functional decline. The PreventIT project aims to: identify early markers of functional decline; develop a tool for personalisation of a lifestyle-integrated exercise intervention; develop an activity database appropriate for seniors; develop a behaviour change intervention; develop a complexity metric to assess early functional decline; and develop and test the intervention framework through pilot studies and feasibility RCT.

Method

We adapted the existing lifestyle integrated exercise programme LiFE to home-dwelling, recently retired seniors (aLiFE). We transferred aLiFE to a mobile health system based on smartphones and smartwatches (eLiFE). We used existing databases to identify trajectories and build prediction models for early functional decline. We used theories and models of behavioural change to develop a motivational framework for the intervention. Data from activity monitoring was used to develop a behavioural complexity metric. We piloted both intervention arms with 30 and 14 seniors respectively before commencing a 3-arm, multi-site feasibility randomised control trial (RCT) in Trondheim, Amsterdam, and Stuttgart, with assessment at baseline, 6 months, and 12 months. The 6-month assessment has been completed, while the 12-month assessment will be completed in August 2018. Focus groups were held at 6 months at all three sites with participants and instructors.

Results

Three trajectories were identified with low, moderate, and high risk for functional decline, respectively, with concomitant risk factors for each gender. Results from the pilot studies indicated that the activity regimen was appropriately challenging. After screening and baseline assessment, 180 participants aged 61-70 were randomised (60 per arm). Preliminary results from all stages of PreventIT will be presented.

Conclusions

PreventIT will provide knowledge about the feasibility of two newly developed home-based interventions particularly designed for changing behaviour over time in the target group of newly retired seniors.
Accuracy of screening methods to predict falls in nursing homes: a prospective multicenter cohort study with six months follow-up

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Background

The aim of this study was to evaluate: fall prediction at one, three and six months follow-up of fall history; staff clinical judgment; the Care Home Falls Screen (CaHFRiS); and the Algorithm for classification of fall risk in nursing home residents.

Method

We conducted a prospective multicenter cohort study in 15 nursing homes. Fall history (i.e. resident having had one or more falls in the 12 months preceding the start of the study), staff clinical judgment (i.e. a physiotherapist, a nurse and a nurses’ aide responsible for the resident each gave their judgment on the single item question “Do you think your resident is at high risk of falling?”), the CaHFRiS (i.e. a multifactorial measurement evaluation tool) and the algorithm for classification of fall risk (i.e. a step-by-step procedure to determine if a resident has a high or low fall risk) were assessed at baseline and falls were documented in the six months follow-up period. Fall prediction at one, three and six months was calculated.

Results

50.2% of the 420 participating residents experiences at least one fall (average fall rate=1.57, ±SD=2.78). Overall accuracy ranged for all screening methods at all measuring points from 54.8% to 66.5%.

Conclusions

Fall history, the algorithm and the CaHFRiS showed the best sensitivity and negative predictive value, two important aspects for good screening. However, taking into account their moderate predictive accuracyno recommendations can be made for the use of any method to predict falls.
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Background

A fall is considered an adverse event that occurs in hospitals which decreases patient safety and increases costs. Researchers refer that almost 1/3 of these adverse events could be preventable. To accomplish the aim of preventing falls, a project was designed in 2012 by Nurse Directors of CHUC’s Administration in collaboration with the research unit of Coimbra Nursing School.

Methods

The “Falls prevention in hospital” project previously had three studies. In the first study; situation diagnoses that revealed different levels of staff involvement and knowledge development, different types of documentation and different fall tools and scarce report of falls.

Due to the results in the previous study, some follow-up actions were undertaken as part of the second study. This were; a) education to reference nurses; b) development of procedures for standardization of occurrence records; c) elaboration of procedures for standardization of risk assessment; d) implementation of a notification system; e) development of guidelines for prevention of falls and; f) production of indicators.

In the third study; a) a replication of the falls education was done by the reference nurse of the unit. b) based on the reference nurses difficulties in educating the staff nurses in falls prevention more activities of education were done followed by discussion, c) swot analyses was done with the reference nurses to evaluate the education impact.

In addition to the previous studies, a fourth pilot study was done in the neurology unit of CHUC to test a fall prevention device supported by Oncaring enterprise.

Results

The teaching strategies used in falls prevention sessions permitted more involvement of the different reference nurses. According to swot analyses the identification of strengths, weakness, opportunities and threats points of view, highlighted future orientations and guidelines with more sustainability. The fall prevention device can be useful in detecting falls in hospital settings.
MHESCH Project: Effects of different types of chair-based exercise programmes on the risk of falls, functional autonomy and physical fitness in pre-frail elderly women.

Cidalina Abreu, Guilherme Furtado, Matheus Uba-Chupel, Nelba Souza, Ana Filipa Pedrosa, Fábio Direito, Taís Rieping, Maria João Campos, José Pedro Ferreira, Ana Maria Teixeira.
Coimbra Hospital and University Center

Background

The main consequence of the aging process is the decreased ability to perform activities of daily living without assistance. Functional autonomy (FA) is defined as the ability to perform instrumental and basic life activities independently. Physical fitness (PF) is the ability to carry out daily tasks and perform physical activities in a highly functional state, often as a result of physical conditioning. Both concepts are directly associated with frailty in elderly persons with a higher incidence of falls. The aim was to evaluate the effects of different chair-based exercise (CBE) programs on the risk of falls, autonomy and functional capacity in pre-frail institutionalized elderly.

Method

The sample consisted of 104 female participants from four elderly care institutions. The participants were divided into 4 intervention groups: a) aerobic exercises (n=32); b) Yoga/type flexibility (n=25), Elastic-band resistance exercises (n=26) and Control group (n=21). To measure the FA and risk of fall, the Portuguese version of the Independence in Activities of Daily Living and Falls Efficacy Scale was used. The Mini Mental State Exam was applied for determination of the Cognitive profile. To analyse PF the Senior Fitness Test Battery was used. The static balance was measured using the Tandem balance test. The tests were applied before, at 14 and 28-weeks of exercise CBE intervention and in all the groups.

Results

After the exercise interventions, the elderly participants of YTF and AE showed substantial improvements in PF, highlighting the capabilities of static and dynamic balance. Substantial strength capacity increased in the lower limbs caused by the EB-R seems to have a positive effect on the balance, but increased endurance capacity was only achieved by the AE program. A substantial decrease in the perception of fear of falling and a slight increase in the perception of FA were also found.
Developing Biocompatible, Passive Technology to Improve Function and Reduce Falls in Patients with Arthritis
Nabeel Ahmed, Emma Stanmore, Patricia Scully
The University of Manchester

Background
One of the simplest indicators of deteriorating health is a person’s balance: defined as the ability to keep the Centre of Mass (COM) within the base of support. Regular exercise incorporating progressive strength and balance training has been shown to prevent falls in older people (strength and balance exercises can reduce falls by up to 40% in older people including those with arthritis). Biocompatible, passive technology has the ability to improve function, mobility and strength through uptake and adherence to balance exercises.

Method
We propose utilising a portable, simple to use, lower limb strength rehabilitation device based on polymer optical fibre (POF) technology with video gaming application: focusing at making the user exercise throughout the game to improve function and reduce falls. Measurement of pressure, using POF technology, enables simultaneous and independent monitoring of the ball and heel of each foot forming four quadrants. This economical system displays postural balance and sway analysis as a stabilogram, which combines pressures exerted on all four zones to formulate Centre of Pressure (COP).

Results
Initial lab tests indicate that the system can resolve forces of 0.98 N with a spatial resolution of 0.05 m. The sensor has a defined sensitivity (in relation to force) of 0.25 % Light Attenuation N⁻¹. Stabilogram and statistical data is readily available as well as real time data analysis. An Exergame was developed through a LabVIEW graphical programme to display the stabilogram from the POF sensor, together with a 3D moving object at which the patient can aim their COP locus, as a proof of principle.

Conclusion
A portable, inexpensive balance and lower limb strength & rehabilitation device based on POF technology has been developed. The next step for the device is its transition into use as a medical device, with the design centred around the themes of movement & falls. The sensor mat is to be trialled with arthritis patients enabling patient assessment and clinical team acceptance and to also monitor patients’ adherence to evidence based exercise therapy, using validated, specific outcome measures to obtain information on variability of outcome scores in the target population.
Protocol: Evaluation of adherence and satisfaction with an exercise program (OEP) for the prevention of falls in older people

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Servicio Murciano de Salud-Instituto Murciano de Investigación Biosanitaria

Background

The Otago International Exercise Program (OEP) was developed as a home exercise program. It includes strength, balance and endurance exercises, whose effectiveness in preventing falls is supported by several clinical trials and systematic reviews. The aim of this study is to evaluate the implementation of the Otago for the prevention of falls in people between 65-80 years old who are not institutionalized, in health centers of the Murcian Health Service. It will evaluate adherence and satisfaction.

Method

A multi-centre study of the implementation of good practices will be carried out and evaluated through a comparative study. It will take place in Murcia, a region of Spain, in 6 primary health care centers, including around 150 patients between the ages of 65 and 80 who are not institutionalized.

This intervention will be developed by a nurse trained as an EOP-LLT, in her primary care consultation, through individualized or group education, in 5 sessions: in the 1st, 2nd, 4th and 8th weeks, and a reinforcement session at 6 months. Participants must complete the exercises for 30 minutes twice a week or perform them as part of their daily routine, in both cases the exercises will be recorded. Each person will receive support material.

The study will be conducted for 18 months from October 2018 to April 2020.

Results

Adherence will be measured by subjective methods, such as scales and self-completion instruments (EARS scale, AESOP scale and exercise diary) and objective methods such as ambulatory physical activity monitoring (Kronosensor® sensors). A pilot study of diagnostic tests will be conducted to compare the Kronosensor device with the adherence reported by patients.

Satisfaction will be assessed through a standardised ad hoc survey and triangulated with qualitative techniques and in-depth interviews with patients and professionals.
City hall promoted folk dance activity: an exercise intervention for community-dwelling older people.

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Garrués MA
University of the Basque Country

Background

Group exercise interventions are effective in fall prevention, especially if challenging balance is involved. Dance constitutes a promising intervention for counteracting the age-related decline in physical and mental abilities since it provides sensory, motor and cognitive demands. If long-term adherence can be achieved, dancing may be considered an important intervention for preventing falls. The aim of this study was to describe a folk dances (FD) programme that has shown great participation and adherence in the older population.

Methods

The teaching methodology and participant characteristics of a popular FD school in Bilbao (Spain) were assessed.

Results

The FD programme was 6 years long, and each level had a duration of one academic year. The progressive difficulty requirements of the program were based on 1) musical demands and/or 2) skills involved in dances and/or 3) the use of space. The programme involved two weekly classes (150 min per week), consisting of 90 min of instruction and 60 min of practice. They were supervised by an experienced teacher of dance with a background in music education. Learning methodology included some tools such as clapping, singing, tempo variation, or rhythm theory. 47% of 331 participants (83% female) enrolled were over 60. The demand exceeded capacity each year and 64% were on a waiting list. The dropout rate was 9%. FD sessions enhanced social interaction, joy and a sense of community with added cultural value. A survey based information recovery is being analyzed to know how the participants perceived the activity.

Conclusions

The FD programme is a long-term group activity with a good uptake and adherence that involves sensoriomotor and cognitive capacities. Groups are heterogeneous in terms of age and gender, providing a better inclusion feeling to older people. The earning tools that are used, as well as teacher’s skills, could also have an important role in better adherence.
How is Tai Chi received by people living with dementia and their informal carers?

Yolanda Barrado-Martín¹, Michelle Heward¹, Remco Polma², Samuel R. Nyman¹
¹Bournemouth University, ²Queensland University of Technology

Background

Falls are a public health issue amongst older adults. Exercise interventions are effective in preventing falls, however, few intervention studies have involved people living with dementia and explored their experiences. The aim of this study was to explore the acceptability of a Tai Chi exercise intervention among dyads formed of an older person living with mild-to-moderate dementia and their informal family carer. This study was conducted as part of a pilot intervention phase of a randomised controlled trial, and designed to inform further trial refinements and future exercise research involving people living with dementia.

Method

Ten dyads from two localities in the South of England took part in weekly Tai Chi classes over a period of 3-4 weeks, during this time they were also encouraged to practice at home. Field notes were used to record researchers’ observations during the classes and participants and instructors’ feedback at the end of each class. One focus group per locality was held at the end of the last class to gather participants’ views (n=7 dyads). Thematic analysis was used to inductively code the field notes and transcripts.

Results

Findings suggest that both members of the dyads were able to follow and enjoy this Tai Chi exercise intervention. Facilitators for the acceptability of the intervention were the socialising component at the end of each class, the skills and personality of the instructor and the discovery of a new pleasurable activity to practise together. The main barrier for their acceptability of the intervention was difficulty following the booklet provided to support their home practice.

Conclusion

A dyadic approach to the delivery of exercise interventions should be considered for people with dementia and their informal carers.
A first characterization of walking frame use in home settings.

The University of Salford

Background

Older adults commonly use walking aids such as walking frames to improve stability, nevertheless their use has been identified as a risk factor for falling\(^1\). Basic guidance is available, for example, the wheels of a front-wheeled walker should remain on the ground whilst the rear legs may be lifted. Whether such guidance is adhered to at home is entirely unknown. Here we present first data of front-wheeled walker use measured in home-settings.

Method

12 frame users aged 65+ were video recorded whilst using an instrumented front-wheeled walker\(^3\). Combined with pressure insoles, the walker informs when the frame feet and the user’s feet are in ground contact. Participants walked through their home and performed a 180° turn. In this study we defined Red Flags (RF) as events when a participant was in single support and one or none of the front wheels were in ground-contact. Yellow Flags (YF) were defined as the participant being in double support and one or none of the front wheels were in ground contact.

Results

During straight line walking 10 participants exhibited YFs and one exhibited RFs. During turning 11 participants exhibited YFs and 3 exhibited RFs. Illustrative data are shown in Figure 1.

Discussion

YFs and RFs demonstrated difficulty in adhering to guidance at home. Videos highlighted corresponding environmental factors such as narrow doorways and changes in flooring. RFs and YFs were more frequent during turning, which may be because the front wheels do not swivel. This suggests that users may benefit from training at home, including specific guidance for turning.
Does a housing adaptation reduce falls-related outcomes?

Agneta Malmgren Fänge, Gunilla Carlsson, Lisa Ekstam, Carlos Chiatti, Maria H Nilsson
Lund University

Background

Falls and fear of falling can result in declining activity and participation, and there is a need to identify sustainable fall prevention measures. Housing adaptations might have the effect of reducing falls; however, it remains unknown whether standardizing this complex intervention can improve this positive effect. This study aimed to investigate the effects of applying a standardized strategy to housing adaptation as compared to ordinary practice, and to investigate the effects of adaptations on fall-related outcomes over time.

Method

Data were collected in three Swedish municipalities; two intervention and one control. Fear of falling was measured using the FES-I, and falls and near-falls were reported retrospectively. 196 clients were included at baseline, with follow-ups at 3, 6 and 12 months. Differences between study groups and changes over time were evaluated using descriptive statistics and mixed-linear models.

Results

The intervention group reported a reduction of -2.04 points on the FES-I scale after three months (95% CI: -3.35 to -0.72, p=<0.001). After 6 months, there were no statistical significant effects. The number of clients reporting actual falls increased over time in both groups, whereas the number of reported near-falls decreased most in the intervention site, but without any statistical significant differences.

Conclusion

Only some differences were identified between the two strategies. The clients often face declining health and an increase in falls-related outcomes over time can be expected. Housing adaptation might be one intervention that complement other interventions in preventing falls, but further research on the relationships between environmental features and falls is required. This knowledge is important to inform the building sector how to improve sustainability of the housing.
Folk dancing or walking: sensorimotor performance in community-living women.

University of the Basque Country

Background

Physical activity has been recommended for older populations to fight against loss of mobility (Singh, 2002), but there is still controversy on the type of exercises that help to prevent cognitive detriments (Sink et al., 2015). From an ecological point of view, the sustainability of physical exercise programs designed to decrease fall risk require exploring the effect of organized physical activities that sustain high attendance rates for prolonged periods (Sherrington et al., 2016). The aim of this preliminary study was to explore the potential of a long-term duration folk dance program to improve motor and cognition capacities in high functioning elderly women.

Methods

This study was carried out with independent community-living women (n=44, 60-72.49 years). We compared sensorimotor differences between participants enrolled for two consecutive years in folk dancing from the Basque Country (FDG) and a physically active group (PAG) that mainly walked and signed up for the first time in the same program promoted by the City Council of Bilbao. This group activity is supervised and controlled by an accredited folk dance instructor. The choice stepping reaction time in the manual version (CSRT-M) was used to obtain mean choice stepping time (Delbaere et al., 2015).

Results

The CSRT-M was significantly better in FDG compared with the PAG (t-value (degrees of freedom)) and p-value, t(42)=2.39, p=0.021. Maximum gait velocity was nearly equal t(42)=0.00, p=1.0.

Conclusion

Dancing might improve sensorimotor-cognition parameters to a higher extent than walking. Preliminary data we are collecting in a prospective controlled study (ACTRN12617000858392) shows that mean rate attendance of older participants enrolled in Folk dances the first year is over 90%. 15.0% of the participants have given up the activity, due to health problems (4%), work-conciliation difficulties (4%), and (7%) resignation in the study. These type of activities should be further explored.
Modern Technology against Falls – The MoTFall project

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Background

The strongest risk factor for falls is a history of falls. Therefore, interventions targeting persons at risk of falling before they are aware of the risk themselves is highly demanded. The prevention of falls is a complex task and has no easy solutions; therefore, an interdisciplinary approach is necessary. Modern technology provides us with novel opportunities to detect and monitor falls and near falls, and have a person centered approach to falls prevention interventions.

Method

In the project, research institutes, universities, private companies, community health care, business advisors, and representatives from the target group participate. MoTFall comprise of nine work-packages, including back-end systems, wearable devices, mobile application, big-data analysis and data fusion and also knowledge dissemination, support and empowerment strategies, business case and education in falls prevention for health care personnel.

Results

A wearable device based on a 9 axis Inertial Measurement Unit, the Snubbblometer®, is an important part of the project. The Snubbblometer has shown to be a valid and reliable device for measuring balance, and to detect near falls events with a sensitivity of 83%. Furthermore, a mobile application has been developed including a fall-risks index as well as fall preventive exercises and information. The mobile application collects information from the Snubbblometer. It is therefore possible to provide information about movement patterns, balance, falls and near-falls. This makes it possible to individualize fall preventive interventions. Testing of the validity of the fall-risks index is ongoing. Finally, within MotFall a web-based education program about falls prevention for health care personnel in the community and in nursing homes has been developed.

Conclusion

A mobile application, including information from a wearable device that can measure human movement, might be one way of reaching a broad group of people in an early stage and thereby prevent future falls.
An exemplar Community Foundation NHS Trust Integrated Falls Management & Fracture Liaison Service

Christina Heaton
Bridgewater Community Healthcare

Background

The Nurse Consultant lead service is an integrated multidisciplinary service that provides specialist assessment, diagnosis and treatment for patients who suffer with falls, reduced balance and fractures. It provides lifestyle advice, investigations into bone density and underlying conditions and promotes bone health and effective treatment for Osteoporosis. We provide therapeutic interventions to improve strength, balance, mobility and function, which aim to improve confidence, and reduce risk of falls and fractures and promotes independence.

Methods

We assess patients who have had a fall or are at risk of falling over 18 years old and assess patient over 50 years old following a fracture. Through integrated working we provide effective and timely assessment and interventions for our patients. We work in partnership with the local acute NHS trust and other agencies such as local leisure trust, ambulance and fire services, local council, charities and national organisation such as the National Osteoporosis Society and their local patient forum. The established patient pathway ensures that patients who require secondary care are referred appropriately and in a timely manner, therefore providing a cost effective service.

Results (3 years)

- 98% of patients referred are seen under 6 weeks
- 100% of patients assessed against NICE guidance
- 100% of patients followed up after bisphosphates started - 60% compliance at 12 months
- DNA - 5% • Referral to secondary care- Falls- 12%, Complex Osteoporsis-11%, other secondary care consultants 2%
- Dexa outcomes - 47% of patients assessed required a dexa scan, of theses; 45% had reduced bone density needing a follow up scan in 2-3 years; 30% required lifestyle advice only and 22% were diagnosed with Osteoporosis and medication was requested to their GP’s.

Conclusions

An effective service providing timely and cost effective assessment, interventions and treatment.
Experiences of falls in domestic settings and use of ambulance services: an ethnographic study.

Christina Heaton
Bridgewater Community Healthcare NHS

Background

Each year, 35% of people over age 65 experience falls and approximately 45% of those are aged over 85 and live in the community. Local unpublished data from an English ambulance service found that following ambulance call outs, 24-32% of the patients were not conveyed to hospital and of those, only 32-52% were referred to the local Falls Prevention Service for a specialist multifactorial assessment (NICE 2013).

The literature review undertaken supported the need for a falls pathway (guidance for practitioners) to be in place. However, it did not uncover the reasons for low referral rates of non-conveyed patients to falls prevention services. This presentation will outline the design of a study which aimed to: a) gain an in-depth understanding of the falls patient journey from patient, carer, and ambulance crew perspectives, b) generate a clear understanding of the ambulance service customs and practices which could inform improvement of the existing falls pathway.

Methods

An ethnographic approach enabled participant’s’ values, behaviours and beliefs to be explored. The methods were participatory observation and semi-structured interviews of patients / carers and ambulance crew. The sample was people over 50 years of age who had fallen or their carers (n= 10) who had been seen by the ambulance service. Ambulance crew were also recruited (n= 10).

Results

The study gained an in-depth understanding of the experiences of crew and patients/ carers. For both ambulance crew and patients/carers, there were two shared themes ‘falls journey’ & ‘falls not being a problem’. For crew ‘training’ was a theme, for patients/carers ‘language’ and ‘patient transport’. In summary, the falls pathway in the local area was clearly understood and followed by all crew observed. The study shared the challenges of recruiting in a hard to reach group.
The implementation of an innovative ‘case-finding’ direct referral pathway supporting the delivery of best practice care to patients reporting falls.

Bryant, J, Shaw, V and Hope, V.
Lewisham and Greenwich NHS Trust.

The Lewisham Community Falls Service (LCFS) was established in 2017. The service model was innovatively designed to incorporate newly proposed recommendations from the evidence base that falls services should be pro-actively case-finding patients known to be at risk of or suffering falls (Falls and Fracture Consensus statement, 2016), thus supporting the falls prevention agenda and offering a solution to the ongoing clinical issue of engaging high risk patient populations with falls prevention services.

A direct referral pathway was established between LCFS and Linkline telecare service run by Lewisham Council. The establishment of this direct referral route allowed for LCFS to be notified of any Linkline service user who has activated their alarm within the previous month reporting a fall.

Patients identified as falling, via this innovative direct referral route, would then be proactively contacted by LCFS and offered an evidence based multi-factorial assessment and intervention (Nice, 2015). The aim of this being to reduce falls risk, injurious falls and the likelihood of falls reoccurrence.

Analysis of the first three months of data collection since the establishment of the direct referral route showed 39 patients were referred to LCFS via the direct referral route. Of this 14 (36%) were included in LCFS caseload and offered intervention. Patients not included onto LCFS caseload were either known to other services, declined or had been admitted to hospital. Where patients were known to other services LCFS offered expert clinical guidance to the treating clinician. If a patient being seen by an alternative service continue to report falls LCFS staff reviewed the patient.

Initial data analysis shows that of the patients who received intervention 10 of the 14 patients went onto report no further falls (via activation of linkline alarm) in the two months following input.

Data collection and analysis is continuing but preliminary results encouragingly show that the establishment of a case-finding direct referral route, allowing services to target intervention to high risk patient populations with known falls risk factors, can reduce the number of further reported falls.
Barriers and enablers to measurement and reporting of the ProFaNE core outcome set in fall prevention trials with older people

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Background

Knowledge synthesis is considered the cornerstone of knowledge translation and is facilitated by standardized outcome reporting. Core outcome sets (COS) are defined as “an agreed standardized collection of outcomes which should be measured and reported, as a minimum, in all trials for a specific clinical area” (Williamson et al., 2017). In 2005, members of ProFaNE published a COS for fall prevention trials with older people. As of January 2015, 464 articles cited the ProFaNE COS, including 34 fall prevention trials with older people; however, none of the 34 trials measured and reported the entire collection of outcomes specified in the ProFaNE COS (Copsey et al., 2016). Our objective is to identify barriers and enablers to application of the ProFaNE COS in fall prevention trials with older people.

Method

We conducted qualitative, semi-structured telephone or video interviews with developers of the ProFaNE COS (Phase A; n=6), and corresponding authors of articles describing fall prevention trials, published between 2006 and 2017, which cited the ProFaNE COS (Phase B; n=5 [ongoing]). Interviews explored barriers and enablers related to capability, opportunity and motivation (COM-B Behaviour Change Wheel). Interviews were audio recorded and professionally transcribed.

Results

We recruited three individuals from the UK, and one each from Australia, Germany and Spain to participate in Phase A, and one individual each from the UK, Germany, Netherlands, Australia, and Denmark to participate in Phase B. Several participants in Phase B were members of ProFaNE. Preliminary thematic analysis identified barriers and enablers related to capability (e.g., barrier: measurement issues in the assessment of physical activity), opportunity (e.g., barrier: limited resources) and motivation (e.g., enabler: perceived credibility of ProFaNE).

Conclusions

Findings should inform strategies to enhance application of existing and future COS in fall prevention trials with older people, ultimately leading to more consistent outcome reporting across trials.
Investigating outdoor trip falls by measuring foot clearance during unconstrained, real-world locomotion

Rebecca Lawson, Julian Todd
University of Liverpool

Background

Most studies investigating the factors influencing gait and stability during locomotion have been conducted in well-controlled laboratory conditions testing walking indoors on smooth, hard, uncluttered surfaces. Our project instead aims to understand gait behaviour under the more challenging conditions encountered in everyday life. We want to assess the objective risks of falling in this complex environment on a step to step basis. We are developing novel, dynamic measures of risk factors for instability and falling when walking freely outdoors over a wide variety of surface textures and slopes and when traversing obstacles such as kerbs, steps and uneven ground. We are particularly interested in trip falls which are caused by the swinging foot unintentionally making contact with a surface.

Method

To achieve our goal we have been using lightweight, robust, wearable sensors to estimate short-term variation in gait. One variable which appears to be important to understanding trip falls is foot clearance (Bula et al., 2015; Kerr et al., 2010). We have been developing a foot-mounted sensor using near-range (0-100 mm; VL53L0X) and mid-range (5-1000 mm; VL6180) time-of-flight lasers to provide estimates of foot clearance at a sample rate of 10Hz during locomotion. We have also been testing whisker-like mechanical sensors with only two (on/off) states and light sensors detecting the foot shadow can provide further estimates of dangerous proximity.

Results

We will present results comparing data from these three, independent, foot-mounted sensor types to data from a laboratory-based, calibrated optoelectronic camera system tracking foot-mounted, reflective markers. We will also discuss data testing the new sensors during unconstrained walking outside with a young adult population with no gait deficits.

Conclusions

Preliminary data indicates that these novel sensors can provide accurate and reliable estimates of foot clearance whilst walking outdoors under ecologically valid conditions.
Examining functional decline trajectories in an English representative sample of 60-70 year olds: A comparison between an analysis conducted using InCHIANTI and LASA longitudinal data sets.

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Background

Frailty is prevalent in UK and EU populations with an estimated 25-50\% of adults aged $\geq$85 developing frailty. Frailty is associated with increased falls incidence. Recent analyses of 60-70 year olds from two EU longitudinal cohorts (InCHIANTI and LASA) by EC funded PreventIT identified 3 functional decline (FD) trajectories over 9 years (little, gradual, severe). Aims: To examine trajectories of FD in an English representative population sample of 60-70 year olds.

Methods

We use the English Longitudinal Study of Ageing (ELSA), waves 2 to 7. Inclusion criteria: age 60-70 at ELSA wave 2. Variables were harmonised from ELSA data to accord with PreventIT variables, 6 items assessed self-reported difficulties with activities of daily living (ADL) and Instrumental ADLs (IADL). The FD assessment tool was scored:0-6. Statistical Methods: Latent Class Growth Modelling (LCGM) was used to identify distinct functional decline trajectories. The identified model of best fit was compared to those identified by PreventIT. Analyses were stratified for sex.

Results

At ELSA wave 2; 3082 participants (52.1\% female) had valid FD and the mean age was 64.83($\pm$3.21). The model of best fit for males and females was the three class model, showing low, intermediate and highest functional decline. Extreme FD was not observed across any of the trajectories (all means < 3). About half of the participants fell within the trajectory of least decline (51.5\% male; 50.8\% female), the intermediate trajectory held 27.8\%(male) and 33.4\%(female) of participants. Fewest participants were found within the trajectory of highest FD; males (20.6\%) and females (15.8\%).

Conclusions

Similar to the PreventIT study, the three-trajectory solution was the best fit in this English population sample of 60-70 year olds. Further work will explore if trajectory membership at wave 2, is predictive of frailty status at wave 7. This approach could potentially help with early identification of those who may be at future risk of falls and frailty.
Implementation of screening for falls prevention in the primary care setting

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¹Tilburg University, ²Netherlands Institute for Health Services Research

Background

Falls are an important and increasing problem among older people. Health care professionals are often unaware of the fall risk of their patients because a systematic risk assessment does not take place. There are various interventions available to prevent falls with a reasonable level of evidence. However, a general systematic implementation of screening for fall risk and referral to such interventions in the primary care setting is lacking. Therefore, the objective of this study is to evaluate the implementation of a systematic and targeted screening of fall risk and subsequent referral to fall preventive interventions among independently living frail older people in the primary care setting.

Method

A suitable and validated fall risk screening tool will be integrated at GP practices. GPs will identify frail older people at risk of falls and invite them to participate in this study. Based on the patient’s risk profile, patients are referred to fall preventive interventions.

Results

This prospective cohort study with a 12 months follow-up aims to include approximately 200 frail older people aged 75 years and older from GP practices. A quasi-experimental design is used to evaluate the implementation of a systematic screening of fall risk and subsequent referral to fall preventive interventions at GP practices. The GP’s number of screened, referred and enrolled older people for fall prevention care will be identified. In addition, barriers and facilitators of the overall implementation process will be explored.
Update and validation of the Flemish guideline for the prevention of falls in community-dwelling older people

Meurrens Julie¹, Leysens Greet², Poels Joris¹, Vlaeyen Ellen¹, Valy Sien¹, Milisen Koen¹
¹University of Leuven, ²Thomas More University of Applied Sciences

Background

24 to 40% of all community-dwelling older people fall at least once a year. The physical, psychosocial and financial consequences emphasize the need to screen for an increased fall risk and to give an overview of effective fall prevention interventions. In this respect, the EVV developed a guideline in 2010. To offer the most recent evidence, an update of this guideline is necessary.

Method

The EVV used the format of the Belgian ‘Working group Development of primary Care Guidelines’ (ebpnet.be). A multidisciplinary working group monitored and provided advice on eight clinical questions. A systematic literature search (including guidelines, systematic reviews and meta-analyses about fall prevention and accidental falls) was conducted in multiple databases and scientific websites from 2010 until August 2015. A multidisciplinary working group and a stakeholder group peer-reviewed the updated guideline.

Results

The updated guideline offers 17 recommendations to the following clinical questions:

1. What are the main risk factors associated with falls in community-dwelling older people?
2. What is the effectiveness of a multifactorial approach on fall incidents?
3. What is the effectiveness of a multifactorial approach on fall-related injuries?
4. What is the best method to assess older persons at high risk?
5. Which multifactorial evaluation is indicated?
6. Which multifactorial interventions are indicated?
7. How can primary healthcare workers ensure compliance in older people?
8. Which primary healthcare workers should be involved in falls prevention?

Conclusions

The updated guideline was approved and validated by the Belgian Centre for Evidence-Based Medicine - Belgian Branch of the Dutch Cochrane Centre (CEBAM). The EVV developed infographics and organized a multidisciplinary course ‘Expert fall prevention with older people’ in 2018, to disseminate the guideline throughout Flanders.
FallSensing - Technological solution for fall risk screening and falls prevention

Inês Sousa, Joana Silva, Dinis Moreira, João Madureira, Cláudia Tonelo, André Dias, Luís Ferreira, Catarina Silva, Juliana Moreira, Anabela Martins
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Background
Falls and injuries related with falls are a serious public health problem. Falls result from a complex interaction between multiple risk factors such as medication intake, environmental hazards, functioning and mobility decline and history of falls. A fall risk screening will estimate a person’s risk of falling and identify those with increased fall risk who warrant a more detailed assessment. The interventions to prevent falls should address multiple risk factors and be tailored to the user, such as the Otago exercise program, that has been validated to prevent falls among elderly.

Method
FallSensing is a technological solution for fall risk screening and falls prevention. The system (software, pressure platform and inertial sensors) is composed by a screening tool to evaluate the fall risk and an intervention application that could be used at clinics, home and social centers, based on the Otago exercise program.

Results
The outcomes of the project are: definition of a quantifiable scale of fall risk assessment; adaptation of fall prevention exercise plans to the user’s risk of fall; modulation of the system so that it can be used by health professionals, facilitating the evaluation and prevention of falls process, by elderly patients at home, being portable and used in an easy, affordable and accurate way, and by groups in day-care centers, to foster social interaction and exercise engagement through serious games.
Movement registration and analysis for fall risk assessment in the hospital: lessons from an observational pilot study.

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Background

A valuable opportunity for reducing the fall incidence in hospitals, is alerting nurses when a patient is about to fall. For such a fall prevention system, more knowledge is needed on what occurs right before a fall. This can be achieved with a stereo camera that automatically detects (and records) dangerous situations.

Methods

Inpatients with a high risk of falling are selected for inclusion. A fall-risk questionnaire is administered and falls are logged during their stay. A stereo-camera (3D BRAVO-EagleEye system) is mounted in the ceiling and monitors the bed with surroundings. A baseline recording is made to improve the algorithms behind the alert system. When a fall or dangerous situation is detected, monitoring data preceding the incident is stored. Data is analyzed to assess 1) the quality of the system and 2) the prevalence of dangerous situations. Interviews with senior nurses are included in the evaluation.

Results

Data collection is ongoing (Currently n=18; falls=1), and currently consists of ±62 hour of baseline recordings and ±24 hour of event-based recordings. These recordings include false positives as well as actual high risk situations.

Conclusions

Despite the initial enthusiasm of the participating departments, inclusion of participants is slow, and the number of falls lower than expected. Possible explanations for this have been discussed with the involved senior nurses. With the monitoring data we gained more insight into the occurrence of dangerous situations, but to be able to reliably predict falls, more data on actual falls should be recorded.
Preliminary results of global balance function research to prevent falls in elderly people

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Background

Research on the global function of balance, stabilization and functional system of anti-gravitation to prevent falls in elderly people is actually a medico–social problem. The study of the human position and balance in the gravitation field of the Earth is the main problem of fundamental physiology, biology, physics and mathematic modeling for validation both for diagnostic markers and therapeutic methods.

Methods

67 patients (29 men and 38 women, age of 68±6 years) with combined myofascial pain in the cervical part of the vertebral column and cerebral ischemia (CI) were examined for understanding the vestibular mechanisms of vertical posture control. Clinical neurological examinations were conducted to identify the role of biomechanically significant biomarkers in the cervical spine. NEC-method of visualization was used to define the cerebral metabolism as marker of brain plasticity. The stabilometric analyzer with biofeedback "Statokinezimetr - Stabilan" was used to assess the dynamic stabilization in vertical posture.

Results

Disorders in the cognitive, personal emotional status, headache and dizziness were present all the patients. Neuro-vertebral examination revealed the biomechanical markers; muscular hypertension in neck region and postural displacement. The NEC-analysis revealed signs in different levels of cerebral acidosis as biomarker for brain hypoxia. Mathematic modeling of the disturbed body posture allowed us to validate “syndromes of uncompleted movements” in all the patients. Integrative scheme of rehabilitation was worked out for patients with postural and neurovascular disturbances for correction of muscle- tonic syndromes in the neck, cranio-vertebral region for improving the cerebral metabolism and liquor outflow in elderly patients. Methods of intermitt hypoxia therapy, breathing and postural gymnastics for activation of the “cognitive brain” were used. Stabilometric training used for improvement of mental functions - attention, cognitive, emotional / volitional performance and maintain balance.

Conclusions

An Integrated examination of the elderly people allowed us to understand the role of postural disorders as risk factors for cerebrovascular disease and dizziness. Comprehensive rehabilitation of the patients improved their clinical and emotional background, cognitive functions and stability. Method of NEC-visualization recorded the improvement of cerebral metabolism and neuroplasticity of the brain. For the purpose of effective training and falls prevention we propose to use the stabilometric gaming applications on the principles of visual modality biofeedback for elderly persons. An Emotionally motivated session of biofeedback training at Stabilometric Platform may be used as new type of balance therapy.
The efficacy of verbal and visual guidance in group Otago Exercise Program for older adults

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Background

Group balance and strength exercise-based interventions, such as the Otago Exercise Program (OEP), have been found effective in preventing falls in older adults. Although, the effect of visual and verbal guidance timing by the group leader on their executive functioning and balance is not determined.

Methods

2 groups of 12 community Cypriot elderly each (aged 73.08 +/-6.05 SD and 75.67 +/-7.3 SD), with good mental ability (score >24 at Mini Mental State Examination) participated in a single-blind clinical control trial. They received individually progressive OEPs for strength and balance, for 12 weeks in two ways of delivery commonly used by OEP leaders. Group 1, performed each exercise under verbal instructions after an initial description and display of the exercise. Group 2, performed each exercise in parallel with their leader, i.e., having simultaneous visual and verbal guidance.

All participants were assessed at baseline, 6 and 12 weeks for their balance, falls efficacy, gait and cognitive functions (using respectively mini-BESTest, FES-I, FGA and MoCA).

Results

In average miniBESTest total score increased 3 points (from 19 to 22/28, p<.001), FES-I total score reduced 2 points (from 24 to 22/64, p=.026), FGA increased 2 points (from 23 to 25/30, p=.004), and MoCA increased 3 points (from 22 to 25/30, p<.001) following 12 weeks OEP intervention in both groups. The timing of visual feedback and previous exercise verbal explanation did not have any significant main effect (p>.05) on their assessed scores, FES-I: (F(1, 17)=1, r=.24), MiniBESTest: (F(1, 16)<1, r=.23), FGA (F(1, 17)<1, r=.08) or mental activities (F(1, 16)<1, r=.05).

Conclusion

OEP significantly improved balance, gait and cognitive functions of community older adults, regardless of the additional previous verbal exercise explanation and whether the visual exercise demonstration was performed previously or in parallel with the group execution.
Fall injuries among 60-75 year old people referred to one referral hospital in Hamadan, Iran

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Background

Fall injuries are one of the important injuries among old people. However, there is a need to increase knowledge about their characteristics and way of prevention. Therefore, the aim of this study was to determine the characteristics and related factors of fall injuries among 60-75 year old people, referred to one referral hospital of Hamadan.

Method

This study was a cross-sectional and descriptive analytical study. Participants were 300 older people aged 60-75 year old, referred to one referral hospital in Hamadan, Iran, due to fall injuries. They were on treatment in the hospital as outpatient or inpatient. The sampling method was convenience sampling. For data collection, questionnaire was used. The questionnaire included questions on: characteristics of injured persons and their injuries; and their preventive related activities, particularly at home. The questionnaires were filled out through interviews. Data were analyzed using SPSS21 software.

Results

The mean age of elder people was 67.73. The most common problems for participants were instability (61.6%) and muscle weakness (56.2%). Most participants were inpatients (92%). The most participants (40.1%) were walking outside the home when they fell. Also 22.7% of injuries were due to falling from steps. There were significant relations between fall injuries and age, gender, education level, and place of residency (p-value<0.5). In addition, there was a significant relationship between fall injuries among participants and their preventive related activities (p-value=0.00).

Conclusions

According to the results of this study, prediction and prevention of falls among elderly people in study setting is essential. It seems that in order to plan interventional programs of fall prevention it is important to educate older people about how can prevent fall injuries both inside and outside the home.
Mobile application for the assessment of physical functioning - viewpoints from the future healthcare professionals

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Background

Physical functioning of older adults is typically assessed with performance-based tests supervised by a healthcare professional. There is a need for an objective method that can monitor performance frequently enough to detect subtle and sudden changes in the condition during everyday situations.

Methods

A prototype mobile solution with wearable inertial sensor and a mobile application was developed for analyzing the movements of the user and estimating his/her fall risk factors. The mobile application instructs the user to perform certain tasks, such as walking, while wearing the inertial sensor. The user receives feedback immediately after the test and is able to see trend visualization of past results.

The application was presented for future healthcare professionals as part of a demo day event organized at the local university. There were total of 14 students, two groups with nursing students (N=3 each) and two groups with medical students (N=4 each), that participated in the introduction and testing. In addition to overall perception, the test persons were asked what information and how it should be presented for different stakeholders, what kind of information could be added to the application and further development ideas.

Results

The overall feedback was positive. The test persons would like to see visualizations of long-term fall risk development and more detailed information about factors contributing to the overall risk. They suggested including current diseases, physical activity, age, gender, and use of assistive devices as background information for risk assessment. Especially the medical students asked for validation results that take into account different walking styles and circumstances.

Conclusions

The developed mobile solution enables quick physical functioning evaluation for fall risk assessment. The potential future users of the application perceived it positively and their improvement suggestions will be utilized when developing the next version of the application.
Associations between mobility and dementia subtypes in nursing home residents

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Background

Most nursing home residents have dementia, and residents with dementia fall more frequently than residents without dementia. In community-dwelling elderly there are some studies indicating differences in mobility between dementia subtypes, while for nursing home residents this remains unknown. In this study we aimed to explore differences in mobility between dementia subtypes in nursing home residents.

Method

Residents with an expected stay of more than four weeks were recruited at admission to the nursing home. The Short Physical Performance Battery and the Nursing Home Life Space Diameter was used as outcome measurements of mobility. Dementia diagnosis was set by two experienced old age psychiatrists. Bivariate and multiple regression analyses were used to analyse differences between groups.

Results

Of the 696 participants, 540 (76%) had a specific dementia diagnosis (Alzheimer’s dementia (n=414), vascular dementia (n=57), frontotemporal dementia (n=47) or Lewy body dementia (DLB) (n=22)). Mean age was 84 years (SD 7.6), and there were more men in the group of residents with DBL. We found no significant differences in mobility between residents with different subtypes of dementia in neither bivariate analyses, nor in analyses controlled for age, sex and degree of dementia.

Conclusion

Nursing home residents with different subtypes of dementia did not differ significantly in mobility. The lack of differences in mobility between residents with different dementia subtypes underline the importance of individual mobility assessments to prevent falls and to preserve mobility in this population.
Developing exercise groups for persons with dementia

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Background

For persons with dementia, PA may influence physical function and ability to perform activities of daily living. In this project the end-users were home-dwelling, older persons (65+) with impaired cognition or dementia. The project consists of three steps: 1) an observational study (n=100 end-users), 2) in-depth focus group interviews (n=8 spouses), 3) a pilot study evaluating a 12-week group exercise intervention organised by use of volunteers. The aim was to gain knowledge about the end-users and to test the feasibility of the intervention.

Method

Results from the two first studies were included in the design of the pilot feasibility study. Overall, home-dwelling, older persons with impaired cognition or dementia participate in few activities outside their homes. Spouses describe a situation with high burden, where there is a need for improved services from the health care system. New services should be tailored to individual needs and preferences rather than focusing on the dementia diagnosis alone.

We developed a group exercise intervention including balance, muscle strength, and physical activities lead by two physical therapists once a week for 12 weeks. We matched each participant with a volunteer that organised the transport from participants’ home to the exercise group location and attended the group exercise sessions. We conducted in-depth interviews or focus groups with the participants (n=4), volunteers (n=5), spouses (n=4), and the physical therapists (n=2) at the end of the 12-week intervention period, to evaluate their experience with participation in this study.

Results

We will present the rationale behind this project and the first experiences from this ongoing project at the EU FF 2018
The UMDEX study: Effects of exercise on falls in older people with dementia living in nursing homes

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Background

Older people with dementia have a high risk of falls and related injuries. Physical exercise as a single intervention has been shown to prevent falls in healthy older people, but in people with dementia the evidence is limited. In nursing homes, it has even been suggested that improved balance could increase falls. The aim of this study was to investigate effects of exercise on falls in people with dementia.

Method

The study was part of the Umeå Dementia and Exercise (UMDEX) study, a cluster-randomized controlled trial, set in 16 nursing homes. 141 women and 45 men, with a mean age 85 years, and a mean Mini-Mental State Examination score of 15 were included. Participants were randomly allocated either to exercise according to the High-Intensity Functional Exercise (HIFE) program (lower limb strength-, balance- and mobility exercise) or to a seated attention control activity. Activities were conducted 2-3 times/week for 4 months. Falls were followed for 12 months (after the end of intervention) by fall incidence reports and review of medical records.

Results

During follow-up, 118 (67%) of the participants fell, in total 473 times. After 6-month follow-up the incidence rate was 2.7 and 2.8 falls per person-year in exercise and control group, respectively. At 12-month follow-up it was 3.0 and 3.2 falls per person-year in exercise and control group, respectively. Negative binomial regression analyses indicated no difference in falls rate between groups at 6- or 12-month follow-up (Incidence rate ratio, IRR 0.9, 95% Confidence interval [CI] 0.5-1.7, \( P = .838 \) and IRR 0.9, 95%CI 0.5-1.6, \( P = .782 \), respectively).

Conclusions

In this study of older people with dementia living in nursing homes, a high-intensity functional exercise program alone did not prevent nor increase falls in the twelve months following intervention when compared with an attention control group.
Realtime fall detection using smartwatches

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Background

Timely detection of falls in real life of at-risk older adults is a topic of utmost important in modern healthcare, more so today with the advent of smartwatches and fitness trackers. Compared to standard call buttons worn in a bracelet or as a necklace, smartwatches are less stigmatizing since their use is not limited to fall detection. They offer several features including a multitude of integrated sensors for activity/sleep tracking, userfriendly graphical interface, realtime display, and internet connectivity for data transfer to the cloud. The ability to detect falls from such a pervasive device allows swift event signalling and intervention by clinicians/family members, considerably reducing health risks following a fall.

Method

A wristbased fall detection algorithm was implemented and tested with simulated falls, revealing high sensitivity. The algorithm collects 3D accelerometer and barometer values from the Samsung Gear Sport smartwatch. A realtime fall detection framework was developed and augmented with a proprietary activity classification algorithm to eliminate potential false positives. An alarm is raised when the algorithm detects a fall and immediately sent to the caregiver. The user also has the option to signal a fall or to cancel a false positive. All detected falls are stored on the cloud for further post processing, thus providing crucial real life data about false positives in an effort to improve the specificity of the algorithm; specificity is a wellknown drawback of most fall detection algorithms.

Results

In the framework of EU project ACTIVAGE, this solution will be implemented in a largescale study in Leeds, UK. The main objectives are to establish user acceptance of an IoT based healthcare system as well as remote monitoring and emergency triggering. Three hundred older adults at lowtomedium risk of frailty or falls will be monitored for one year using Samsung smartwatches. Besides falls, data on activity and energy usage will be available. This data will be used to build multidimensional models related to frailty evaluation.
Towards an accessible pre-screening tool for fall risk assessment: automated gait analysis using a machine-learning approach

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Background
A key factor in successfully preventing falls, is early identification of elderly with a high risk of falling. However, currently there is no easy-to-use pre-screening tool available; current tools are either not discriminative, time-consuming and/or costly. This pilot investigates the feasibility of developing an automatic gait-screening method by using a low-cost optical sensor and machine-learning algorithms to automatically detect features and classify gait patterns.

Method
Participants (n = 204, age 27 ± 7 yrs.) performed a gait test under two conditions: control and with distorted depth perception (induced by wearing special goggles). Each test consisted of 4x 3m walking at comfortable speed. Full-body 3D kinematics were captured using an optical sensor (Microsoft Xbox One Kinect). Tests were conducted in a public space to establish relatively 'natural' conditions. Data was processed in Matlab and common spatiotemporal variables were calculated per gait section. The 3D-time series data of the centre of mass for each section was used as input for a neural network, that was trained to discriminate between the two conditions.

Results
Wearing the goggles affected the gait pattern significantly: gait velocity and step length decreased, and lateral sway increased compared to the control condition. A 2-layer neural network could correctly classify 79% of the gait segments (i.e. with or without distorted vision).

Conclusions
The results show that gait patterns of healthy people with distorted vision could automatically be classified with the proposed approach. Future work will focus on adapting this model for identification of specific physical risk-factors in elderly.
PROCARE: Prevention and occupational health in long term care

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Background

Due to the demographic change, the average age of people who need institutional care is increasing. Recent studies indicate that physical activity can effectively be applied during inpatient care to enhance physical functioning, falls prevention, cognition and psychosocial well-being. Since there is a lack of specific evidence-based guidelines on exercise for the very old and institutionalized people, high-quality studies are needed, which examine the results of interventions for this multimorbidity target group and transfer them into the structures of the health system. The efficacy of a multi-component intervention for nursing home residents is investigated in this multicenter study sponsored by the Techniker Health Insurance.

Method

48 nursing home facilities in eight locations throughout Germany are included in the project. A blinded assessor will assess the primary and secondary outcomes upon entry to the study (T1) and the assessment will be repeated after 16 weeks (T2), and a follow up (T3). The assessments will focus on changes of physical functioning and gait, cognitive performance and quality of life/social engagement. The developed intervention includes an exercise program over a period of 16 weeks. In addition, the workplace health promotion for the nurses will be addressed.

Results

The study is designed to provide information about the effectiveness of needs-based and multi-component activity programs in inpatient care. Results from this trial will contribute to the evidence on motor-cognitive approaches in the maintenance of mental and physical function as well as encouragement of older adults to an active social engagement in life. The findings will help to derive activity recommendations and guidelines for health promotion targeting physically frail nursing home residents.

Moreover, health promotion programs for the nurses are desirable to reduce work related stress as well as musculoskeletal disorders. Especially geriatric nurses and professional housekeepers require programs to reduce mental stress in combination with ergonomic movement programs.
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