



# Annual Report 2012

Mercer's

Institute

for

Research

on

Ageing

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## **MIRA Personnel**

### **Steering Committee Members**

Prof Davis Coakley (Chairman)  
Prof J Bernard Walsh (Director)  
Prof Rose Anne Kenny  
Prof Brian Lawlor  
Prof Jim Malone  
Dr Conal Cunningham  
Dr Miriam Casey  
Prof Joseph Harbison  
Dr Elaine Greene  
Dr David Robinson  
Ms Carol Murphy (Administrator)

### **Watt's Clinical Research Fellow**

Dr Kevin McCarroll  
Dr Avril O'Beirne

### **Memory Clinic Research Fellows**

Dr Aíne Ní Mhaolain  
Dr Eileen Sweeney

### **Lecturer**

Dr Bláithín Ní Bhuacalla

### **Falls and Osteoporosis Unit Research Fellows**

Dr Rosaleen Lannon  
Dr Najia Siddique  
Dr Lorraine O'Keeffe

### **Clinical Neuropsychologists**

Dr Robert Coen  
Dr Marie McCarthy

### **Clinical Nurse Manager**

Ms Irene Bruce

### **Senior Social Worker**

Mr Matthew Gibb

### **Biostatistician**

Prof Cathal D. Walsh

### **IT Consultant and Technology Adviser**

Mr Vincent Quinn

### **Falls and Osteoporosis Clinical Nurse Specialists**

Ms Niamh Maher	Ms Kara Fitzgerald
Ms Nessa Fallon	Ms Georgina Steen
Ms Kara Fitzgerald	Ms Dymphna Hade
Ms Lisa Byrne	Ms Ciara Rice



**Senior Radiographer**  
Ms Eilish McDermott

Ms Zsafia Toth

**Medical Physics and Bio-Engineering**  
Dr Gerard Boyle

Dr Ciarán Finucane

Ms Emer Kenny

## **Technology Research for Independent Living (TRIL)**

### **Project Team:**

#### **Lead Principal Investigators:**

Prof Rose Anne Kenny  
Prof Brian Lawlor  
Prof Richard Reilly  
Prof Ian Robertson

Dr Brian Caulfield, Research Director  
Dr Aisling O'Halloran, Senior Researcher  
Dr Joe Wheaton, Senior Researcher  
Ms Lisa Crosby, Research Nurse  
Ms Clodagh Cunningham, Research Nurse  
Mr Tim Foran, Senior Medical Physicist  
Ms Rebecca Schnittger, Research Assistant  
Dr Joanne McHugh, Research Assistant  
Ms Collette Garry, Research Assistant

## **The Irish Longitudinal Study of Ageing (TILDA)**

### **Project Team:**

Prof Rose Anne Kenny, Lead Principal Investigator  
Prof Brendan Whelan, Research Director  
Prof Alan Barrett, Project Director  
Mr Ian Clifford, Survey Manager  
Mr Conor Moody, Data Manager  
Dr George Savva, Biostatistician  
Ms. Una Murphy, Project Manager  
Dr Ann Hever, Research & Development Manager  
Dr Ciáran Finnucane, Biomechanical Engineer  
Dr Hugh Nolan, Biomedical Engineer  
Dr Annalisa Setti, Psychologist  
Dr Belinda King-Kallimanis, Epidemiologist  
Dr Christine McGarrigle, Social Epidemiologist  
Dr Cathal McCrory, Social Epidemiologist  
Dr Eibhlin Hudson, Health Economist

### **Research Fellows:**

Dr Aisling O'Halloran	Dr Vincent O'Sullivan	Dr Claire O'Regan
Dr Celia O'Hare	Dr Irene Mosca	Dr Joanne Feeney
Dr Matthew O'Connell	Dr Orna Donoghue	Dr Hilary Cronin

### **Executive Officers:**

Ms Lliana D'Emidio	Ms Jacinta O'Grady	Ms Pauline Walsh
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### **Research Nurses:**

Ms Laura Dunne	Ms Lorna Greene
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## **HRB Translational Study Team**

Prof Michael Rowan, Department of Pharmacology TCD  
Dr Christian Kerskens, Research Fellow  
Ms Sheila Dillon, Clinical Research Nurse  
Ms Catherine Brien, Executive Officer

## **The Trinity, University of Ulster and Department of Agriculture Study (TUDA)**

### **Project Team:**

Principal Investigators: Dr Conal Cunningham, Dr Miriam Casey, Prof JB Walsh  
Research Fellow: Dr Kevin McCarroll, Dr Rosaleen Lannon  
Research Nurses: Ms Helen Toohey, Ms Sinead McNiffe

## **Enhancing Care in Alzheimer's Disease Study (The ECAD Study)**

Dr Avril O'Beirne

## **Adjunctive Protein Supplementation in Osteoporotic Patients Treated with Recombinant Parathyroid Hormone**

Principal Investigator: Dr Miriam Casey  
Research Fellow: Dr Najia Siddique  
Clinical Nutritionist: Ms Caoimhe McDonald,

## **Secretaries**

Ms Deirdre Cummins	Ms Martha Gavin
Ms Rachael Farley	Ms Nicola Doherty
Ms Lisa Masterson	

## Past Personnel

(Whose published work was carried out while working in the Mercer's Institute for Research on Ageing details of which appear in this year's annual report or in recent reports produced by the Mercer's Institute)

### Research Registrars

Dr C Connolly  
Dr A Denihan  
Dr R Doyle  
Dr A Eustace  
Dr C Fallon  
Dr R Mulcahy  
Dr M Kirby  
Dr H Lee  
Dr A Lynch  
Dr C Maguire  
Dr M Moran  
Dr D Gallagher  
Dr R Romero-Ortuno  
Dr L Cogan  
Dr S. Ni Bhrian  
Dr H O'Connell  
Dr D O'Mahony  
Dr G Swanwick  
Dr D Hennelly  
Dr H Cronin  
Dr T Coughlan  
Dr S. Kennelly  
Dr D Robinson  
Dr C O'Luanaigh  
Dr N Collins  
Dr S Squires  
Dr G Choon Chan  
Dr C O'Dwyer  
Dr J Browne

### Medical Physics & Bio Engineering

Dr M Al-Kalbani

### Watt's Fellow:

Dr David Robinson

### Research Psychologists

Dr A Blanco  
Ms B Cullen  
Mr N Kidd  
Ms S O' Doherty  
Ms E Palombella  
Ms L Carolan  
Mr I Evans  
Ms F Hamilton  
Ms E Tehee  
Ms S Callinan  
Ms D Finnegan

### Medical Social Worker

Ms M Headon

### PhD Student

Ms M O'Reilly

### Physiotherapist

Ms M O'Sullivan

### Social Scientist

Ms C Somerville

### Research Assistants

Ms V Buckley  
Ms B O'Dea  
Mr C Wynne

## Introduction

2012 has been very eventful for the Mercer's Institute for Research on Ageing. In December 2012 planning application for the new Mercers' Institute for Successful Ageing was lodged with the Dublin City Council Planning Department. Full planning permission was granted in February 2013. Construction work on the new Centre is scheduled to commence in Autumn of this year.

The new centre will incorporate the new MIRA building, in-patient wards and new ambulatory clinical care areas for falls, syncope, memory, bone health and osteoporosis as well as general outpatients.

We are very appreciative of the help and support that we have received from Atlantic Philanthropies the Department of Health and the Board of St James's Hospital, the Chief Executive Officer and Senior Executives within the Hospital, the clinical staff within the Department of Medicine for the Elderly and the staff of the Mercer's Institute for Research on Ageing. We are particularly grateful to our planning and project team officers Mr Niall Mc Elwee and Karl Coughlan and to Carol Murphy our Senior Administrative Officer who have taken lead roles in the planning process. We are deeply appreciative of the help and support that we have received from the Health Service Executive in particular its Chief Architect Mr Paul De Freyne and his team.

Ambulatory Care Facilities will be provided on the ground floor, with Clinical Support Services located on the first floor. The Mercer's Institute for Research on Ageing will be located on the first and second floor. Ward Accommodation will be on the second to the fifth floors while the Medical Department of Gerontology and Dementia Services Information Development Centre will be located on the 6th Floor.

The construction works for the main MISA project are scheduled to be complete in Q4 2015 with the fit out continuing into 2016.

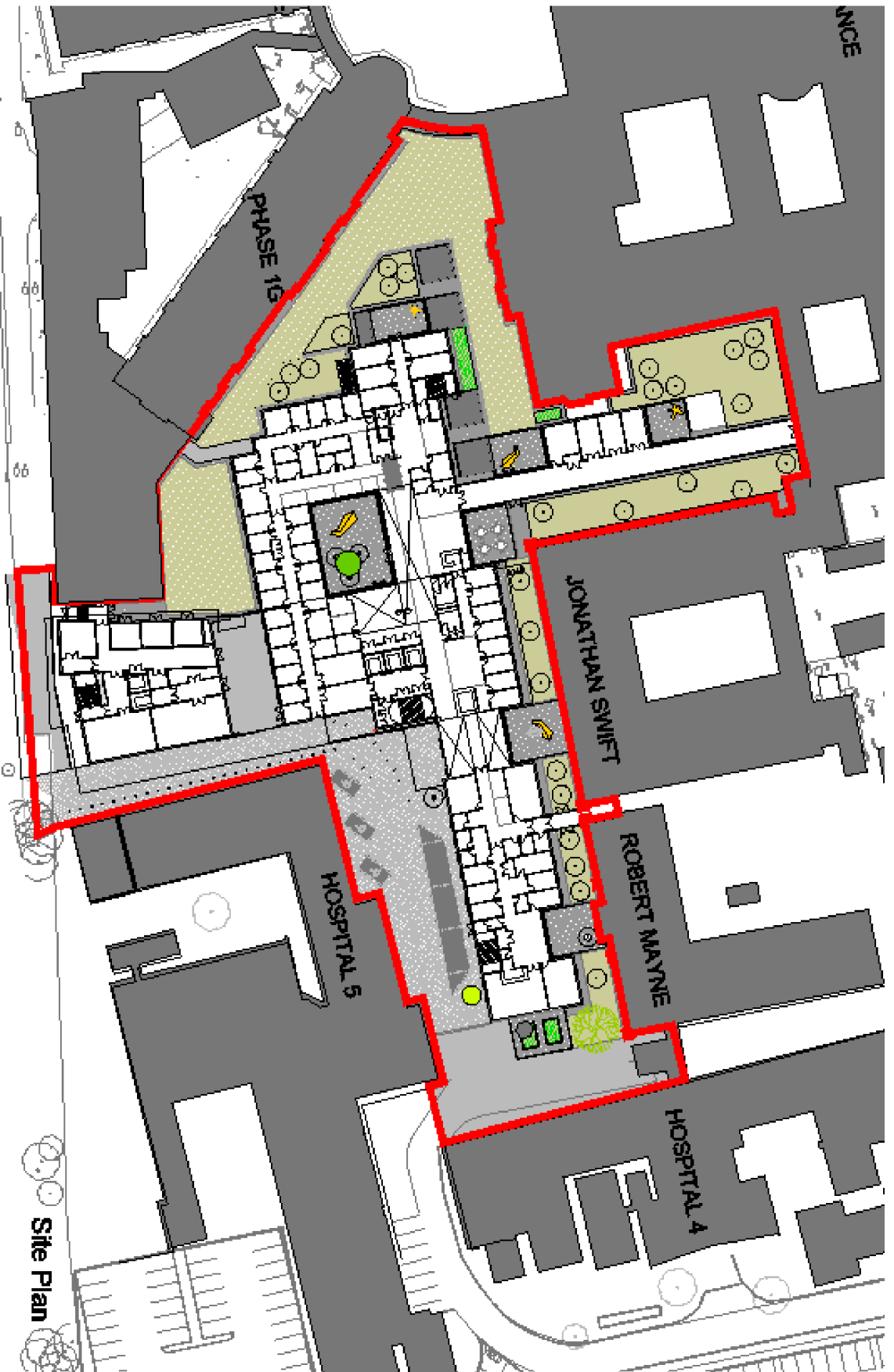
The Mercer's Institute for Research on Ageing will be an integral part of the new Mercer's Institute for Successful Ageing building.

The Good Samaritan logo, the original Mercer's Hospital emblem, will be maintained as the logo for both MIRA and MISA.



Architects image of the Mercers Institute for Successful Ageing





Site Plan

During the past year each of the different units in the department have continued to show successes in the clinical research and teaching area. A number of doctors were awarded doctorates on the work they undertook in the Mercer's Institute and in the units in TCD associated with Mercers.

Niamh Collins PhD "Ocular Microtremor as a Clinical and Scientific Tool in Neurologic Disease; Validation and Application of a Generalised Discovery Protocol" Feb 2012 (Supervisor: Prof D Coakley)

Orla Collin PhD "Autonomic Influences on Cognitive Impairment - determinants of conversion to dementia" March 2012 (Supervisor: Prof RA Kenny)

Carol Stone PhD "An Investigation of the incidence of falling and risk factors for falls in adults with advanced cancer" June 2012 (Palliative care SpR supervised by Prof RA Kenny)

Clodagh O'Dwyer PhD "Vasovagal Syncope in the Older Adult" Dec 2012 (Supervisor: Prof RA Kenny)

Áine Ní Mhaoláin PhD "Frailty in an Older Population: The Impact on Community-Dwelling Elders, Dementia Patients and Older Caregivers" Sept 2012 (Supervisors: Prof Brian Lawlor/Prof RA Kenny)

Joe Browne MD "An investigation of risk factors for fracture in patients with osteoporosis and osteopaenia using biomechanical, biochemical and radiological assessments" June 2012 (Supervisor: Prof J. Bernard Walsh).

Damien Gallagher MD "Caregiver Burden in Alzheimer Disease and Mild Cognitive Impairment" (Supervisor: Prof Brian Lawlor)

Claire Crowe (Doctorate in Clinical Psychology) "Psychological distress in Post Stroke Survivors"

(Supervisors: Dr David Heavey/Prof J Harbison/Dr Robert Coen)

Professor Brian Lawlor has taken the lead in the European clinical framework study on Alzheimer and Nilvadipine.

NILVAD is a 7th European Framework Programme (FP7) funded investigator driven clinical trial in Alzheimer's disease which aims to test the benefit of nilvadipine over an 18 month period compared to placebo in 500 people with Alzheimer's disease. The study will be carried out in 9 European countries and is sponsored by St. James's Hospital.

Nilvadipine is a medication usually used to treat high blood pressure and is generally safe and well tolerated. The study, led by Professor Brian Lawlor of the Mercer's Institute for Research on Ageing in MISA and TCD was developed from an earlier safety study with nilvadipine in Alzheimer's disease patients conducted in MIRA / MISA in partnership with the US Roskamp Foundation.

NILVAD is the largest study of its kind currently being carried out in Alzheimer's disease. It's particularly exciting that this groundbreaking research in Alzheimer's disease is being driven by MIRA / MISA researchers and is co-ordinated by TCD, MISA and St. James's Hospital.

The first patients should be entered into the study by March/ April 2013.

The Bone Health Unit has presented at European, American and Irish meetings on its research in the management of vertebral, hip and peripheral fractures and on work with Vitamin D particularly as it pertains to falls. Work on new Anabolic Bone Studies using the established drug PTH and the newer anabolic agent sclerostin antibody are underway in our Bone Health Unit.

TILDA continues to have a major and increased role to play in our knowledge on health and illness in the over 50's in Ireland. At the end of 2012 Wave 1 was archived at the Irish Social Science Data Archives (ISSDA) this data is now available to researchers in Ireland and beyond. Wave 2 commenced in early 2012 and is now almost complete.

Professor J. Bernard Walsh was elected President of the Irish Gerontological Society and the Society (IGS) had its 60th Annual General Meeting in September. It took place in University College Cork. It was extremely successful with a large volume of research been presented at the AGM.



IGS President Prof J. Bernard Walsh presenting Dr Dan Ryan with a Presidential Medal for his work on Stroke



Prof J. Bernard Walsh with John Buttimer, Lord Mayor of Cork

We had a large volume of work presented from MIRA at the IGS AGM. Dr Dan Ryan was awarded a presidential medal for his work on Stroke which he had undertaken in the Mercer's Institute.

While the tight financial budget continues to impact on our flexibility for expansion we have maintained core research activities thanks mainly to the support that we receive from the Mercer's Hospital Foundation, from St. James's Hospital and from the research funding received from MIRA's participation in international studies.

Ireland's Second National Memory Clinic Conference was held in April 2012 in the Guinness Storehouse with the keynote speech being given by Prof Gordon Wilcock, founder of the British Dementia Research Group and Chair of Gerontology at the John Radcliff Hospital in Oxford. There were 150 attendees from all parts of the country. It was a tremendous success with presentations from the cutting edge of research given by people involved in the care of patients with dementia and Alzheimer's disease. The Memory Clinic has also participated in lead research in the area of anxiety, cognition and biomarkers.

Dr David Robinson has made significant progress in the Local Area Mapping Project (LAMP), which focuses on the assets and resources of the local community in South Inner City Dublin, . By focusing on "assets" we are concentrating on the positive attributes of the population and on the strengths in the community, focusing on cooperation between the different groups and on new partnerships between community, industry, technology, St James's Hospital and primary care services. This is modelled on a similar development in South Chicago which is being run there in partnership with the University of Chicago and which is being championed and led by Michelle Obama, the University of Chicago and the local community.

Our Falls and Syncope unit continues to mushroom in its growth with just under 4,000 patients attending in 2012, which represents a 25% growth on number attending in 2011.

All patients with a history of blackouts, syncope and falls and referred to St. James's Hospital diagnostic and treatment service.

Prof Joe Harbison has continued to play a major role in the development of stroke services and stroke research not only in St. James's Hospital, the Mercer's Institute and Trinity College but he also has had a major national role as one of the two national HSE leads in stroke care in Ireland.



Finally as we look forward to the new Centre getting underway we again extend our deepest appreciation to the Department of Health and to Atlantic Philanthropies who was a major catalyst and benefactor in progressing the project and planning the construction of the new building. We are also hugely indebted to those who have sponsored our research including the European Union FP7 Programme, the Health Research Board and the various pharmaceutical technology companies.

Most of all we express our deepest gratitude to the continuous unfailing support we receive from our longest and most loyal benefactor, the Mercer's Hospital Foundation. Without the support of the Foundation's Board the Mercers Institute would never have got underway back in the 1980's. The support we receive from the Mercer's Hospital Foundation remains the main source of seed funding for the majority of our new research projects and it forms the back bone of the funding for the day to day running of the Mercer's Institute.

A special thanks to Ms. Judy Oxley who collated the different sections and page set and printed the MIRA Report for 2012.

Finally, may we dedicate this year's report to the memory of our great friend and long term colleague, Desmond Dempsey who died in November 2012. He has given selflessly to the Mercer's Institute since its foundation and he was a stalwart supporter of our work and initiatives over the years. He has also given hugely to Irish medicine and Irish health care and we will miss him greatly.

Ar dheis Dé go raibh a anam dílis.



Professor J. Bernard Walsh  
Director  
Mercer's Institute for Research on Ageing



Professor Davis Coakley  
Chairman  
Mercer's Institute Steering Committee



Professor Rose Anne Kenny  
Director  
Mercers Institute for Successful Ageing

## Mercer's Memory Clinic

There were approximately 1070 patient visits to the memory clinic in 2012, the highest number of visits since the foundation of the clinic. This number of visits reflects an increase of 10% in the number of patients seen in the clinic compared to 2011.

Patients have an initial assessment visit and a subsequent feedback visit. At the feedback clinic patients and their families are seen by a doctor and by the social worker, if required. Results of all tests, diagnosis and future management are discussed with the patient and their family. Further family meetings can be arranged at the family's request if required. Many families require extra meetings particularly when the patient has received a diagnosis of dementia.

### **NILVAD: A European Multicentre Double-Blind Placebo Controlled trial of Nilvadipine in Mild to Moderate Alzheimer's disease.**

NILVAD is an investigator driven Phase III Clinical TRiL funded by the European Commission under FP7 (Principal Investigator Prof. Brian Lawlor of the Mercer's Institute). It entails a multicenter European trial in 8 different languages in 9 countries.

The project started on January 1st 2012 and the kick off meeting was held in Dublin on February 15th 2012. The trial is funded by the European Framework 7 Programme. St James's Hospital is the sponsor for the trial. The Phase 3 trial will perform a double-blind, placebo controlled study to test the efficacy and safety of Nilvadipine in 500 subjects with mild to moderate Alzheimer's disease over a treatment period of 18 months. Men and women aged between 50 and 90 in nine European countries will be included in the study. If the trial is successful, Nilvadipine will be marketed for the treatment of Alzheimer's disease in Europe.

Dr. Coen is the Work Package Leader for Education and Training and has also been involved in acquiring and developing for use across 8 European countries the primary and secondary outcome measures (ADAScog, SMMSE, CDR and DAD). Data collection is expected to commence in Feb 2013.

A substantial amount of work has been done by the NILVAD team ensuring that everything is in place for the trial to start in March 2013. This has included securing the supply of the study drug, procuring a Good Manufacturing Practice (GMP) certified facility to over-encapsulate the



Prof B Lawlor, Dr D Robinson and Dr R. Coen

Investigational Medicinal Product (IMP), creating the source data worksheets and building the electronic case report system, acquiring the study insurance, applying for the regulatory and ethical approval and ensuring all staff are trained in the study protocols. Once the trial kicks off it will run for 36 months in each site, with a recruitment window of 18 months. The project itself will run until December 2017.

## **Anxiety Management**

Anxiety management courses have been run for patients with anxiety and mild cognitive impairment in the clinic during 2012. Dr Eileen Sweeney Research Fellow in Psychiatry and Irene Bruce Clinical Nurse Manager led the courses.

Dr. Eileen Sweeney has a research interest in the burden of anxiety and related disorders in older people, particularly in those with either subjective or neuropsychologically established cognitive problems.

#### *Epidemiology and correlates of anxiety in cognitive disorders*

The Geriatric Anxiety Inventory has been introduced as part of the standard Memory Clinic neuropsychiatric assessment, in order to facilitate pick-up of clinically significant anxiety in a population with memory complaints. Its use has been audited and it has been shown to increase detection rates for anxiety from 3% to 17%, bringing our figures closer in line with international epidemiological data. This audit is 'in press' with the International Journal of Geriatric Psychiatry.

#### *Biological correlates of anxiety in cognitive disorders*

Several studies in recent years have associated higher cortisol levels in older people with poorer cognitive performance and accelerated decline in Alzheimer's disease. Recruitment is almost complete for a cross-sectional investigation of the cortisol 'waking slope' in patients with amnesic Mild Cognitive Impairment, to compare those with and without generalised anxiety symptoms. In 2013/14, this will be extended into a longitudinal follow-up study, examining the relationship between the matutinal cortisol surge and rate of decline of cognition, particularly delayed memory, over one year.

#### *Intervention for anxiety in cognitive impairment*

During 2011/12, Dr. Eileen Sweeney developed and piloted 'AGE' (Anxiety-management Groups for Elders), a 10-session group therapeutic intervention for generalised anxiety in older people with memory complaints, which encompasses Cognitive Behavioural Therapy and Mindfulness-based approaches. This pilot intervention was delivered in a group format, to maximise access for patients and cost-effectiveness for the clinic. Specific modifications were made to allow optimum participation, even where the participant has physical or cognitive impairments. Psycho-education for carers was also provided as part of the intervention.

Four complete cycles of the group have been completed and preliminary results presented at the recent RCPsych International Congress 2012. Benefits have been shown in terms of anxiety symptoms, quality of life scores and subjective ratings of day-to-day memory function.

Four ten-week courses have been completed with very positive feedback from patients. The anxiety management offered is based on Cognitive Behavioural Therapy and Mindfulness. Patients who attend the memory clinic with a diagnosis of Mild Cognitive Impairment and anxiety are offered places on the course. Patients are invited to bring a friend or family member with them to the course to act as a co-therapist assisting them with their homework and practice of mindfulness. This anxiety management is a pilot programme and one more course will be run in the spring of 2013 before final analysis of data will take place. If the analysis proves positive it is hoped to continue providing this service for memory clinic patients in the future.

#### **Functional Assessment**

Approximately forty-four patients attended the memory Clinic during 2012 for assessment of function. Functional assessment is a vital component in the assessment of patients with suspected cognitive impairment and dementia. All patients who attend the Memory Clinic have their functional assessment assessed by proxy account of function. In cases where there is no informant to provide proxy account of function or where the proxy account is inconsistent with the patient's cognitive scores a direct assessment of function is carried out in the Memory Clinic. Direct assessment involves the patient carrying out some everyday household tasks in a controlled setting. The direct assessment tool used in the clinic is the Naturalistic Action Test (NAT). This test takes approximately thirty minutes to complete.



### **Ireland's Second National Memory Clinic Conference -Friday 27th April 2012**

The Mercer's Institute for Successful Ageing and the Dementia Services Information and Development Centre were once again delighted to host Ireland's National Memory Clinic Conference. The theme of the conference was "Memory Clinics Intervention and Assessment" and was held at the Guinness Storehouse, Dublin 8. The purpose of the conference was to share best practice experience of Memory Clinics operating in Ireland as well as ensuring that they become an integral part of the diagnosis and care for people living with dementia. The keynote speech at the conference was delivered by the eminent Professor Gordon Wilcock, founder of the Bristol Dementia Research Group and currently chair of Gerontology at the John Radcliffe Hospital in Oxford. He has many publications to his name including 'Diagnosis and management of dementia: a manual for memory disorders teams'. (OUP, 1999). Other speakers included Clinical Neuropsychologist Professor Narinder Kapur who spoke about the role of a Memory Aids Clinic in Memory Rehabilitation and Dr Colin Doherty, Consultant Neurologist who discussed his experiences of running a Behavioural Neurology clinic. The conference was well attended by leading physicians and allied health personnel involved in the assessment and diagnosis of neurodegenerative disorders in Ireland.



Professor Brian Lawlor  
presenting at the  
National Memory  
Clinic Conference



Professor Brian Lawlor with Dr Aoibhinn Lynch and Dr Andrew Eustace at the Conference - both past Research Fellows of MIRA

### **The Memory Clinic and The Irish Longitudinal Study on Ageing (TILDA).**

Having assisted with the development and implementation of the cognitive battery used in TILDA (PI Prof Rose Anne Kenny), Dr. Coen in collaboration with TCD Psychology Dept, TCD, staff and post-grads and TILDA staff is continuing normative and other analyses of the cognitive tests from the TILDA battery. Various findings have been evaluated and presented at national and international meetings. MMSE has been evaluated, and further normative analyses are currently under way, including factor analysis of the MoCA. Wave 2 data collection has been completed and Wave 3 assessments are currently being finalised in consultation with Prof. Rose Anne Kenny, Prof. Ian Robertson and the members of the Neurocognitive Group who meet regularly.

### **Studies of post-stroke fatigue, PTSD and Psychological distress.**

Dr. Coen, Prof. Joe Harbison, Stroke Consultant, and Claire Crowe, a Psychologist in Clinical Training, TCD Doctoral Programme, developed a research project to investigate possible links between post stroke fatigue and Post Traumatic Stress Disorder (PTSD). Claire completed the project and successfully submitted the work as her Research Thesis in fulfillment of the research strand of her Doctorate in Clinical Psychology (with Distinction). She presented the findings at the Annual Conference of the Psychological Society of Ireland.

Following on from this work Niall Halligan, Psychologist in Clinical Training, TCD Doctoral Programme is undertaking further exploration of the influence of Psychological Distress on Post-Stroke Fatigue, working in close collaboration with Prof. Harbison's Clinical staff. The protocol has been submitted for Ethical approval and data collection will commence in Feb 2013.

#### **Carotenoid supplementation in age-related macular degeneration (AMD).**

In collaboration with Principal Investigator Dr. John Nolan, Waterford IT, Dr. Coen is an active advisor / collaborator on two major studies evaluating cognitive outcomes following Carotenoid supplementation: (i) Enrichment of Macular Pigment and its impact on vision and blindness: Central Retinal Enrichment Supplementation Trials (CREST) (ii) Carotenoids and Age-Related Dementia Study (CARDS). Both studies are currently in the data collection phase.

#### **Cognitive Impairment in patients with HIV Infection.**

In conjunction with Dr. Colin Doherty, Consultant Neurologist and others, Dr. Robert Coen is providing supervision for Dr. Patricia McNamara's PhD research on Cognitive Impairment in patients with HIV Infection. Two submissions have been accepted for presentation at the American Academy of Neurology 65th Annual Meeting, March 2013, San Diego, CA.

#### **Neuropsychological functioning and prosthetic rehabilitation outcomes.**

In collaboration with Dr. Fiadhait O'Keefe, NRH and colleagues in DCU and NUI Maynooth, Dr. Coen is a co-investigator in research being undertaken by Richard Lombard-Vance for his PhD investigating neuropsychological functioning in lower limb amputees. Many will have lost their limbs due to peripheral vascular disease or other medical difficulties, such as diabetes. These conditions are linked with a decline in cognitive function, and can lead to vascular cognitive impairment. The aim of this research is to compile a cognitive profile of lower limb amputees and investigate how their cognitive abilities relate to rehabilitation outcomes. The research is on-going.

#### **Single Assessment Tool (SAT) Working Group**

Dr. Coen was a member of the Single Assessment Tool (SAT) Working Group and also the Research Advisory Group established by the HSE Older Persons Care Group Team and chaired by Prof. Brendan McCormack. The workgroups worked on the development and implementation of a National standardised needs assessment instrument for use throughout Ireland. Following an extensive review process the InterRAI was selected for pilot implementation, a study protocol was developed, Ethical approval obtained, and the study was successfully completed, headed up by Doug Beaton, SAT Project Manager, Informatics Lead, HSE Health Intelligence. A paper describing the research and findings is now in press in the Irish Medical Journal (see publications). A second paper is in preparation.

#### **Encouraging behaviour change in mild cognitive impairment patients: development of educational material.**

MIRA Memory Clinic Staff were involved in a cross-border CARDI-funded research study in collaboration with Dr. Jayne Woodside, Nutrition and Metabolism Group, Centre for Public Health, QUB, Belfast, Prof. Peter Passmore, Ageing Research Group, Centre for Public Health, QUB, Belfast and colleagues. The aim of the study was to develop educational materials encouraging adaptive behaviour change in individuals with mild cognitive impairment, and to evaluate its utility. The study has been completed, materials developed, and a report forwarded to CARDI. A paper describing the research and findings is now in press in Ageing & Mental Health (see publications).

### **Comparison of patients referred into memory clinics in Belfast and Dublin.**

Dr Coen and MIRA Staff were also involved in another cross-border CARDI funded project led by Dr. Suzanne Barrett of the Centre for Public Health, Queen's University Belfast, which aimed to examine and compare some of the characteristics of people at the time of referral who sought help for dementia symptoms. The subsequent report (A Comparison of People Presenting with Symptoms of Dementia in Northern Ireland and the Republic of Ireland (Barrett & Savage, 2012, CARDI) looked at two memory clinics, the Belfast City Hospital Clinic in Northern Ireland and the MIRA Memory Clinic, St. James Hospital, Dublin.

### **NEIL Memory Research Unit, TCIN**

NEIL (Neuro-Enhancement for Independent Lives) was established to create a research infrastructure to accelerate the development of methods to delay dementia. The NEIL programme for cognitive enhancement and dementia prevention comprises both research and intervention initiatives. In November 2011, NEIL established a Memory Research Unit (MRU) under the direction of Prof Ian Robertson, Prof Brian Lawlor and Dr. Sabina Brennan and Dr Robert Coen. The purpose of this unit is to collect rich and comprehensive data from a large number of healthy adults aged 50+, with the aim of furthering understanding memory and related processes, and the aspects of people's lives that influence these processes as they age.

### **BIOMARKAPD & MIRA BIOMARKER RESEARCH STUDY**

#### **Background:**

MIRA Biomarker Research Study: A pilot study on the utility of CSF and blood biomarkers in the delineation of the aetiopathology of cognitive impairment and in the prediction of conversion of mild cognitive impairment to dementia.

Prof Brian Lawlor, Principal Investigator, Dr Sarah O' Dwyer, Clinical Research Fellow and Dr Mary Gardiner, Scientific Project Manager are running this research study in the MIRA. The study involves close collaboration with Dr Siobhan Hutchinson Consultant Neurologist and Dr Patricia McNamara Clinical Research Fellow are also involved in this study. Other research sites collaborating are the Mater Hospital (Prof Tim Lynch) and St Vincent's University Hospital (Dr Chris McGuigan).

The purpose of this biomarker study is to explore whether measuring biomarkers of neurodegeneration including protein fragments and other constituents in spinal fluid and in blood of patients with cognitive impairment is helpful in elucidating the underlying cause of their cognitive deficits and for those diagnosed with mild cognitive impairment (MCI), in predicting who will progress to dementia.

Currently patients are being recruited for study participation at all sites and cognitive testing and collecting CSF has commenced. A biomarker reference range is being established in the CPL laboratory in St James's Hospital with the ultimate aim of establishing this biomarker assay as a routine clinical test available to clinicians in Ireland, as part of the diagnostic work-up for investigation of neurodegenerative diseases

It is also aimed to establish a national biobank for blood and CSF samples in St James's Hospital, to facilitate and promote future clinical research among Irish collaborators in this research area.



## BIOMARKAPD:

This Irish study is part of a larger European funded collaboration called BIOMARKAPD (Biomarkers for Alzheimer's disease and Parkinson's disease), involving 48 research sites worldwide with the objective of developing evidence-based guidelines for the measurement and the use of biochemical biomarkers for Alzheimer's disease (AD) and Parkinson's disease (PD) in clinical practice.

In IRELAND the Health Research Board (HRB) is contributing funding to the EU initiative called the Joint Programming Neurodegenerative Disease (JPND) and the BIOMARKAPD project is just one of many projects that is part of this EU initiative aimed at establishing multi-national, collaborative research projects that will add value to existing research through addressing novel approaches to improve and harmonise the use of biomarkers in the area of neurodegenerative disorders.

## Trinity University and Department of Agriculture (TUDA) Cohort/ Phenotype/Genotype database

TUDA is a large cross sectional, collaborative study involving the Mercer's Institute, Trinity College Departments of Gerontology, Old Age Psychiatry and Biochemistry, the University of Ulster and the Department of Agriculture. It aims to create a nutritional genotype/phenotype database of community dwelling subjects aged over 60 on the island of Ireland (north and south) with certain age related diseases. This research will form part of a wider Nutritional Phenotype database that is being conducted across several sites.

Recruitment has now been completed with 3200 participants in the TUDA study at St. James's Hospital. This is comprised of two cohorts, 1700 with cognitive impairment and 1500 with osteopaenia/osteoporosis, all of whom have undergone a detailed assessment including comprehensive questionnaires on medical, psychosocial, family and dietary history in addition to several neuropsychological tests and biophysical and blood measurements including some for genetic analysis. In addition, a further 2000 subjects with hypertension have been recruited from GP practices in the North of Ireland through collaboration with our colleagues at the University of Ulster.

The total study population in TUDA makes it one of the largest studies of its kind in Ireland. The TUDA database is and will be a hugely important resource for research within the Mercer's Institute for several years to come. Certain disease entities (cognitive impairment, osteoporosis and hypertension) have been deliberately over represented so as to increase the power to look for environmental and genetic associations with these states. The scope of TUDA is such that it will provide the opportunity to investigate on a wide range of age related conditions in older adults including frailty, cardiovascular, cognitive, bone and mental health. This may identify potential dietary, clinical, biochemical and genetic risk factors and help to understand how their interaction may increase susceptibility to certain diseases.

Preliminary analysis to date from TUDA has found a significant relationship between lower serum vitamin D levels and the presence of cognitive impairment, depression and falls after adjusting for numerous confounders. Dr McCarroll continues to analyse the relationships between Vitamin D and depression, falls and blood pressure and will submit the results as part of his doctoral thesis in the coming year.

Further analysis of the RBANS (Repeatable Battery for the Assessment of Neuropsychological Status) results in the TUDA study, looking at normative values, was presented at the IGS in 2012, and noted that misclassification of cognition can occur based on the RBANS and recognised the importance of interpreting normative values depending on individual clinical cases. Further analysis for cut off values for Frontal Assessment Battery (FAB) and RBANS in the full TUDA dataset is ongoing.

The new Watts Fellow Dr Avril Beirne is undertaking further analysis of the TUDA cognitive cohort and is particularly interested in evaluating the relationship between Vitamin D, cognition and Mild Cognitive Impairment (MCI). Further prospective and longitudinal studies are underway to assess this potential association over time and across many cognitive domains and will form the basis of her doctoral work which will be submitted in 2015.

At present the TUDA coordination group are in the process of finding European partners to follow the cohort prospectively. An initial application for FP7 (Foodage study) funding as part of a European consortium looking at diet and cognitive ageing was shortlisted (but ultimately not funded) in 2010. Further collaboration is ongoing. An application for HRB funding of a prospective study looking at inflammation and vitamin D in the TUDA cohort was submitted in 2012 and a decision is awaited.

### **Local Asset Mapping Project (LAMP)**

This project has been designed in partnership with the University of Chicago. It is a preventive health project aimed at older people living in the catchment area of the hospital, using a combination of asset mapping and community health assessments to create a detailed picture of the catchment area. LAMP is unique because community partners will perform the asset mapping.

LAMP now has the support of St James's Hospital Foundation and we will map the streets with students from Warrenmount Presentation School in April. Medical students from Trinity College will survey the Warrenmount students around their attitudes to ageing. The Presidential Awards body, Gaisce, has offered to accredit the mapping activity. Our community partners are the South Inner City Community Development Association (SICCDA) and we have also presented LAMP to the Fatima Regeneration Project.

Other LAMP partners include the Health Service Executive who wish to test and deliver their standardised community health assessment, and the Health Intelligence Unit who have offered data. Finally, LAMP will be used as the first project in Connected Health, a new partnership between St James' Hospital and the Digital Hub to explore technological solutions to clinical problems.

Dr Robinson presented the Local Asset Mapping Project to the South Inner City Community Development Association, Fatima Regeneration project, the Royal Hospital Donnybrook and our partners in general practice. Dr Robinson also participated in the Living with Dementia programme, giving a public talk on the importance of early diagnosis in Trinity College. LAMP was a major part of the Active Age conference (Guinness Storehouse, Autumn 2012) which brought together industry leaders with clinicians. Dr Robinson was invited by Dublin City Council to be guest curator of their blog for a period in Spring 2013: the chosen theme was how design might influence ageing in Dublin city.

### **Community outreach activity**

A new general practice liaison service was set up between Mercer's and the Rialto Medical Centre by Dr David Robinson. This has been a great success, being popular with the practice and its patients. The liaison service saw approximately 30 patients over the course of ten visits, making in excess of 50 recommendations. This service will extend to the Liberties Primary Care Centre in 2013.

A new partnership between St James' Hospital and the Digital Hub has been formed to explore technological solutions to clinical problems. Dr Gerard Boyle (Medical Physics) has developed this, and LAMP will be used as the first project.

### **Bone Health and Osteoporosis Unit.**

The Bone Health and Osteoporosis Unit based in MIRA continues to be extremely active in the assessment, diagnosis and management of patients with fractures and osteoporosis. Prof JB Walsh and Dr Miriam Casey are the principal consultants in the unit and co-ordinate research activities and the overall running of the service.

#### **Summary of Unit:**

- Clinical nurse specialist (CNS) led Pre-assessment clinics
- Fracture liaison service
- Colles and hip fracture clinics
- Parathyroid hormone patient monitoring
- IV zoledronic acid administration and monitoring
- Denosumab administration
- Inpatient falls and fracture prevention service
- DXA scan service
- Research projects

#### **Clinical Nurse Specialist-Led Preassessment Clinics:**



Radiographer preparing patient for DXA Scan

The Clinical Nurse Specialist (CNS) led pre-assessment clinics, which occur twice weekly, continue to be the first point of contact for patients who are referred for assessment of their bone health and risk of fracture. Patients attend from 3 sources: External referrals from general practitioners or other hospitals. General medicine clinics within St James's Hospital. Fracture liaison service – all new hip, Colles and peripheral fractures over the age of 50 are referred to this service. A comprehensive assessment is performed on all patients. This includes review of risk factors for osteoporosis, risk factors for falls and advice on diet, lifestyle modifications and education on treatments.

On a patient's first attendance at this clinic an extensive bone screen is undertaken. This includes a DXA scan, a calcaneal bone ultrasound, a full biochemical and haematological workup including serum bone turnover markers.

Clinic Type	2011	2012
<i>Preassessment Clinic (Total)</i>	<i>1222</i>	<i>1454</i>
<i>New</i>	<i>553</i>	<i>626</i>
<i>Review</i>	<i>408</i>	<i>828</i>
<i>Colles/upper limb Fracture</i>	<i>75</i>	<i>65</i>
<i>Hip Fracture</i>	<i>89</i>	<i>50</i>
<i>IV Zoledronic Acid Clinic</i>	<i>261</i>	<i>266</i>

Table 1. Breakdown of Patients attending the CNS-led Clinics within the Bone Health and Osteoporosis Unit.

In 2012, a total of 1454 patients were seen in these clinics, which is an increase of 19% from 2011 and continues to reflect the demand for this specialised service. The number of patients making return visits doubled in 2012. This highlights the essential role of the CNS in monitoring the efficacy of treatments as well as promoting compliance and managing side effects. The breakdown of patients seen in the various osteoporosis assessment clinics is as follows:

#### **Fracture Liaison Service:**

All older patients presenting to St James's Hospital and the Mercer's Institute with a peripheral fracture are identified and are offered assessment and follow up at the CNS led pre-assessment clinic. This service incorporates an orthopaedic ward round where patients in need of the service are identified. Patients who sustain a fracture who are discharged directly from the Emergency Department are also followed up and monitored.

#### **Colles and peripheral fracture follow-up Clinic.**

Colles fractures are important to identify as their presentation may be an early indicator of osteoporosis. These patients are offered a follow-up appointment at a Specialised Osteoporosis Clinic which occurs every 2<sup>nd</sup> Thursday morning. This nurse-led clinic reviews risk factors for falls and osteoporosis. Patients are commenced on treatment as indicated by their assessments.

#### **Orthogeriatric Round and Hip fractures:**

Hip fractures are the most common fracture seen on the orthogeriatric ward round. Hip fractures are associated with increased morbidity and mortality and tend to occur in older patients. These patients require significant input from the multidisciplinary team including nurses, physiotherapists, occupational therapists, social workers and the medical team.

<b>Year</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>	<b>2010</b>	<b>2011</b>	<b>2012</b>
<b>Hip Fractures</b>	<b>164</b>	<b>196</b>	<b>167</b>	<b>172</b>	<b>180</b>	<b>197</b>	<b>253</b>	<b>166</b>

Table 2. Number of Hip Fractures admitted to St James's Hospital every year since the setting up of the service

Hip fractures account for nearly 10% of all non-vertebral fractures and for a higher proportion of fractures in the elderly.

In 2012, 166 hip fractures were assessed on a weekly round by a Specialist Registrar and Clinical Nurse Specialists (CNS) and bone protection commenced where possible. All patients are then offered an appointment in the pre-assessment clinic.



### **Recombinant Parathyroid Hormone Treatment:**

Approximately 500 patients have been prescribed recombinant Parathyroid Hormone treatment to date. These patients are often complex with severe osteoporosis and multiple fractures and have been refractory to other treatments. In patients with vertebral fracture international studies have shown a substantial improvement in bone quality and also in back pain following this treatment of which there are two forms available. All patients on Parathyroid Hormone therapy are regularly followed up in the CNS-led service to monitor serum biochemistry, urinary calcium and to observe for any side-effects.

### **Intravenous Zoledronic Acid Clinic:**

Intravenous Zoledronic acid is a useful treatment in the prevention of both vertebral and non-vertebral fractures in patients with osteoporosis. It has been shown to significantly reduce mortality in patients after hip fracture. It provides an alternative to oral bisphosphonates and is also an option for patients who are deemed not suitable for PTH therapy and in patients post PTH therapy.

There were 266 infusions of Zoledronic acid administered in Robert Mayne Day Hospital in 2012. It may be given 6 monthly or yearly. Patients are assessed by the medical team at the Bone Health Clinic prior to administration of the drug. Serum calcium and vitamin D levels are measured within one week of the infusion by the CNSs in order to monitor for hypocalcaemia. This has led to a reduction in the incidence of complications from the infusion.

### **Denosumab Injections:**

In late 2010 Denosumab was introduced for the treatment of osteoporosis. To date 228 patients have been prescribed the drug in our Bone Health clinic. It is administered as a subcutaneous injection every 6 months either by the CNS's or in the community. Serum calcium and bone markers are measured 2 weeks post-dose. Reported side effects have been rare making it a safe as well as a convenient treatment option in our older population.

### **DXA (Clinical Densitometry Service):**

Our DXA service carried out 2655 scans in 2012 which is an increase from 2507 in 2011. This service is open to referrals from general practitioners in the local community as well as from other consultants within the hospital. Patients who have significant osteoporosis on DXA will be offered assessment in the Bone Health Clinic.

### **Falls and injury prevention service**

2012 Total: 256 (down from 322 in 2011 – 20.5% reduction)

None in Connolly Norman (Elderly Acute PsyEL ward)

New Falls: 113 (116 in 2011 down 2%)

Recurrent falls: 143 (206 in 2011 down 30.5%)

70 (27.3%) of falls resulted in injuries - mainly lacerations/haematomas with 5 hip fractures and 1 Colles fracture.

In early 2012 the falls and injury prevention programme was rolled out across the hospital. In May 2012 rolling education sessions were delivered by the Clinical Nurse Specialists to disseminate the hospital policy to all clinical areas. Since this intensive awareness drives the risk management office has reported a reduction in the falls rates on all wards. The CNSs continue to participate in the hospital falls prevention group.

In addition Nessa Fallon CNS joined the HSE National Falls Working Group during the year. The aim is to develop a training resource that will provide professionals with the information and skills to address the problem of falls and fractures in high risk groups, their families and communities and will also educate older adults about the risk of falls and falls prevention. The falls working group plan to develop a standardised national training resource for all health personnel that will enable staff nationally to deliver training in a similar format.

### **Research Projects:**

#### **MOVE Study:**

Principal Investigators:	Prof. JB Walsh Dr. Miriam Casey
Clinical Investigators:	Mr. Niall Hogan Mr. Johnny McKenna Mr. Tom McCarthy Dr. Rosaleen Lannon
Clinical Nurse Specialists:	Ms. Kara Fitzgerald Ms. Niamh Maher

Comparison of the Effects of Teriparatide with those of Risedronate on Lumbar Spine Bone Mineral Density in Men and Postmenopausal Women with Low Bone Mass and a Recent Pertrochanteric Hip Fracture.

The aim of this multinational multicentre prospective randomised study is to test the hypothesis that recombinant parathyroid hormone (1-34) 20 micrograms subcutaneously once daily is superior to risedronate 35mg orally once weekly, by assessing change from baseline to 18 months of lumbar spine BMD in men and postmenopausal women with low bone mass and a recent pertrochanteric hip fracture as measured by dual energy x-ray absorptiometry (DXA). It will also look at Bone Mineral Density at the femoral neck and total hip of the non fractured hip. We will also use timed "Up & Go" and visual analogue pain scale and SF-36 Health Status Questionnaire to assess differences in outcomes between the two groups. Recruitment started in 2012 and the duration of the study is 2 years.

#### **PACE Study:**

Clinical Investigators:	Dr. Miriam Casey Prof. JB Walsh
Clinical Nurse Specialists:	Ms. Georgina Steen, Ms. Nessa Fallon, Ms. Kara Fitzgerald

This study commenced in early 2009. It is a European observational study to collect information on adherence, demographics and clinical characteristics of patients prescribed PTH 1-84 (Preotact) and to monitor safety for 2 years following initiation of treatment. The study will conclude in 2013.

#### **Intervention of the Clinical Nurse Specialist in Hip Fracture Patients**

Clinical Investigator: Ms Niamh Maher, Clinical Nurse Specialist

*"Post Hip Fracture in Older Adults: Intervention and Strategies for Improving Outcomes. The role and Function of the Clinical Nurse Specialist within an Elderly Falls Unit"*

Hip fracture patients are at increased risk of disability after hip fracture and may be at risk of further falls and fractures. This ongoing randomised control study examines whether or not a Clinical Nurse Specialist co-ordinated, multidisciplinary holistic assessment and interventions lead to improved post hip fracture outcomes in elderly persons over the course of one year when compared to the post-hip fracture outcomes of elderly persons who do not receive such assessment and coordinated intervention. Ms Niamh Maher (Clinical Nurse Specialist) is currently writing up her thesis which is due for completion in 2013.

#### **Sclerostin Antibody Study [AMG 785]**

This is a multicentred, International, randomised, double-blind, Alendronate-controlled study to determine the efficacy and safety of AMG 785 in the treatment of postmenopausal women with osteoporosis. MIRA has been selected as a site to participate in the study of Sclerostin Antibody in Osteoporosis. The study is due to begin in Spring 2013.

Primary Investigators: Prof JB Walsh  
Dr. M. Casey

#### **Ajunctive Protein Supplementation in Osteoporotic Patients treated with Recombinant Parathyroid Hormone (1-84) (Pro Bone Study)**

Primary Investigators: Dr MC Casey  
Professor JB Walsh  
Dr N Kennedy

Clinical Investigators: Dr. Najia Siddique (Research Registrar)  
Caoimhe McDonald (Dietician)

The role of increased dietary protein in terms of bone gain at different skeletal sites is very topical. However, related evidence to date has been controversial. Therefore this ongoing study in St James's Hospital aims to identify whether the addition of protein supplements to recombinant parathyroid hormone (PTH 1-84) therapy results in augmentation of the anabolic effect on bone in patients with osteoporosis.

The primary outcome of this original study is to compare the gains in BMD at lumbar spine between those treated with PTH and Protein to those treated with PTH alone. The secondary outcome is to track changes in nutritional and anthropometric status throughout the trial period. This was a 2 year randomised controlled study which commenced in 2010 and aimed to recruit 180 patients. Recruitment is due to draw to a close in 2013 and results are awaited.

#### **Falls and Blackout Unit (FABU)**

At some point in their lives, 40% of individuals will have an episode of blackout or faint. For the majority of younger individuals this represents a benign faint and they do not need to be assessed by a doctor. However, if this proves recurrent or if a blackout occurs in an older individual this does require investigation, due to the risk of underlying cardiovascular aetiology.

The Falls and Blackout Unit (FABU) is an out-patient assessment clinic that runs five days a week where patients with unexplained falls, syncope and presyncope are investigated using state of the art cardiovascular technology. The FABU operates a one stop assessment clinic and allows for a detailed investigative work-up. It is endeavoured that all tests are carried out on the day and a diagnosis often made with only one visit being required by the patient. The FABU aims to negate

the need for hospital admission in those presenting with syncope and falls. Once diagnosed patients can link into existing hospital resources (including referral to Day hospital for gait and balance retraining or referral to cardiology services) but the vast majority are dealt with solely by the clinic and discharged back to the community.

The clinic commenced in 2003 with Dr Conal Cunningham and with the arrival of Prof. Rose Anne Kenny, moved to a new expanded site beside the Emergency Department in 2005. An increase in staff and space allowed for a rapid increase in the numbers of patients assessed. Activity continues to increase significantly every year with the main source of referrals coming from the Emergency Department, Inpatient Referrals within St James, GP's, Cardiology services, Neurology Services, services and Peripheral Hospitals from all around the country. It provides the largest syncope clinic service in Ireland.

### **Clinic Staff**

#### **Consultants:**

Professor Rose Anne Kenny (Director)  
Dr Conal Cunningham

#### **Specialist Registrars / Registrars:**

Dr Blaithe Ni Bhuachalla (Lecturer in Medical Gerontology)  
Dr Celia O'Hare (TILDA Research Registrar)  
Dr Dan Ryan (Stroke Research Registrar / Stroke Fellow)  
Dr Lorraine O'Keeffe (Research Fellow Neurocardiovascular Instability Study)  
Dr Cunningham Registrar  
CRU Registrar

#### **Specialist Nurses:**

Ms Ciara Rice  
Ms Dymphna Hade  
Ms Lisa Byrne  
Ms Maria Datahan (Acting CNS covering leave)

#### **Administrative Staff**

Ms Nicola O'Doherty  
Ms Clare Dooley

### **Investigations undertaken routinely in the FABU include:**

ECG

Bloods

Active stand (finometer enables continuous beat to beat blood pressure and heart rate to be recorded)

Italian Protocol and Front-loaded Head up Tilting

Carotid Sinus Massage

24hour blood pressure monitors (N=14)

Cardiac event monitors (N=14)

Holter monitors (N=1)

Internal loop Recorder Monitoring (The number of patients attending the clinic who have an internal loop recorder inserted is in excess of 160 and of these 135 are monitored remotely via Carelink technology, in addition to clinic downloads and review)



Hallpike and Epley Maneuvers (particle repositioning therapy for BPPV)  
Autonomic Function Test  
24Hour Urine Collection (Urine Volume and Electrolytes)

### **Consultant-Led Clinics in FABU**

Prof Kenny's clinics take place Monday to Wednesday inclusive. This is a tertiary referral service, accepting referrals from age 16 upwards. Dr Cunningham's clinic takes place on Fridays. It is a specialist clinic for those >65 years with unexplained falls and blackout. On all clinic days except Thursday, inpatient referrals are seen in addition to booked appointments. In the event an inpatient referral has not been reviewed prior to discharge, it is prioritised as an outpatient. Emergency department referrals are now by means of Electronic Patient Record (EPR) while inpatient referrals to date are via paper form. An EPR consult for inpatients is currently being developed and the aim is for its implementation in 2013.

In the past few months significant steps have been made towards a paperless system. All event monitor requests are made via EPR within the clinic and both the results of these, together with blood pressure monitor results, are uploaded and can be reviewed on EPR. Results ordered by doctors in the clinic are sent to their EPR inbox for review.

### **Nurse-led Clinics:**

Nurse led autonomic function testing clinics occur once a week on Thursday in the FABU. All patients are previously reviewed by a doctor in another FABU clinic prior to the testing being done, however the autonomic function tests themselves are performed and interpreted by the specialist nurses in the unit. The protocol utilised is the Ewing Battery.

Nurses solely supervise attachment of monitors for patients within the clinic and also on the wards. There is also an individual monitor clinic. This system allows for quick assessment of blood pressure and heart rate on a 24 hour or seven day basis. Monitors available are 24 hr BP monitors, a Holter monitor and 24 hr ECG seven day event monitors. Downloading of results and reporting are carried out by nursing staff.

Nurses within the clinic act as a direct line of contact for patients, who phone in on a 9-5pm basis and are able to advise and instigate conservative measures often preventing unnecessary A&E attendances. This is in addition to the following activities amongst others; routine and non routine phlebotomy e.g. synacten testing and patient education regarding internal loop recorder insertion and remote monitoring via Carelink.

### **Carelink**

In 2010 a remote monitoring system for Implantable Loop recorders was established. This service provides a facility where patients can send heart recording via a telephone line for immediate review by nursing and medical staff, thereby improving efficiency and safety for these patients. To date 135 patients across Ireland have availed of this service in 2012. The service allows for immediate review of heart rate activity thereby reducing the number of hospital visits required for that patient.

## Statistics:

Falls and Blackout Clinic: Summary of Attendances at all clinics - Professor Kenny/ Dr Cunningham/ Autonomic Clinic/ Monitor Clinic.

	New Patients	Return Patients	Total
2006	710	549	1259
2007	690	1178	1868
2008	710	1574	2284
2009	974	2143	3117
2010	837	2079	2916
2011	795	2015	2810
2012	847	3083	3930

Table 1. Attendances at all Falls and Blackout Clinics

	New Patients	Return Patients	Total
2009	27	200	227
2010	89	514	603
2011	33	549	582
2012	50	1132	1182

Table 2: Falls and Blackout Unit: Monitor Clinic

	New Patients	Return Patients	Total
2011	-	-	65
2012	7	76	83

Table 3 Falls and Blackout Unit: Autonomic Clinic

	Number of Patients Attending FABU
Internal Loop Recorder (ILR) in Situ	>160
ILR Monitored Via Carelink	135
Number of Monitor Downloads Reviewed per Month	30-50

Table 4 Falls and Blackout Unit: Internal Loop Recorders Clinic

In 2012, the total number of new patients seen was 847 and total number of reviews was 3083, which can be interpreted overall as a significant increase in activity, 1120 more patients having been assessed compared to 2011.

## Teaching and Audit

Training of both medical and nursing students occurs on an ongoing basis along with visiting nursing staff from centres in other hospitals where syncope units are in the early stages of development.

Audit occurs on an ongoing basis in the FABU, with particular focus on improving service provision.

Presentations to other departments within the hospital such as cardiology and emergency room staff occurs intermittently, as a means of providing training and developing awareness of the service, in addition to facilitating interdepartmental collaboration, both clinically and in terms of research.

A Clinical Case Conference in FABU takes place every two months. This is a forum for all staff in the FABU to present and discuss clinical cases and review literature relevant to falls and syncope.

Ciara Rice (CNM3) has organised a Second National Syncope Training Day –which will take place on February 22<sup>nd</sup> 2013 in the Durkan Lecture Theatre in the Trinity Health Sciences Building. The course directors are Professor Rose Anne Kenny and Dr Conal Cunningham. Keynote Speeches will be given by, Dr Nicholas Gall, (Consultant Cardiologist, King's College Hospital, London) and Dr Simon Taggart, (Consultant Clinical Neurophysiologist, JCUH Middlesbrough).

Audit occurs on an ongoing basis in the FABU, with particular focus on improving service provision.

#### Research:

Ongoing research continues within the clinics.

The FABU also worked closely with the TRIL clinic in 2012, both in terms of assessment of patient referrals from TRIL and referring research participants to TRIL. Areas of research include neurocardiovascular instability and its relationship to falls, blackouts and cognitive deficits.

In 2012, Dr Clodagh O'Dwyer (SPR ) was awarded a PhD for her research within the FABU into age-related differences of the clinical characteristics of vasovagal syncope. This included completion of a study eliciting the prevalence of amnesia for loss of consciousness in younger and older age-groups with VVS. Further work analysing age-related cortical change at time of symptom onset in VVS using combined EEG and HUT testing was carried out in liaison with the Department of Neurophysiology, SJH and the Trinity Centre of Bioengineering.

Dr Daniel Ryan (SpR ) is working towards completion of a PhD, within the Stroke Service, in the subject area of hypotension and borderzone stroke. As a component of his work he is also investigating focal neurology associated with presyncope and syncope. This research is in part conducted in FABU utilising finometry and head up tilting facilities.

Dr Aoife Laffen (Department of Neurology), as a component of her research work in 2012, utilised some of the specialised cardiovascular technology in FABU, hence further strengthening collaboration with the Department of Neurology.

Dr Lorraine O'Keeffe as the Research Fellow in the Neurocardiovascular Instability Research Study also assesses patients in the FABU as a component of her research.

In the coming year it is hoped there will be collaborative further research between the Emergency Department and FABU involving internal loop recorder technology and syncope in the older patient. Dr Blaithin Ni Bhuachalla will be hoping to include this work as part of her PhD research.

## Stroke Service – St. James's Hospital & Mercer's Institute

The stroke service has continued to develop over 2012 with the appointment of new staff and the development of new services. In 2012 more than 350 new inpatients were seen by the stroke service, 885 were seen in our Nurse led secondary prevention clinic and 513 patients attended the rapid access Neurovascular Clinic. We continued to develop our thrombolysis service and in 2012, 42 patients underwent the procedure. In addition to this we obtained new TREVO clot retrieval devices which means we can now physically remove clots from the cerebral arteries of people suffering stroke which are too severe for standard thrombolysis to be effective. In 2012 we appointed Olivia Mahon to join Suzanne Walsh as a second Clinical Nurse Specialist in Stroke. Olivia has a long background in ICU nursing and has taken the lead in developing inpatient services for stroke patients.

Prof. Joe Harbison has remained in his role as Joint National Clinical Lead for Stroke and the results of the first year of the programme have been published. In 2011, for the first time, the number of people with stroke dying in Irish hospitals dropped below 1000 and this was reflected by a significant reduction in the numbers requiring nursing home care and an increase in people being discharged home. The Department of Health, 'Key Trends' survey reported a 5.9% reduction in stroke mortality in 2011 the only major disease category to show a reduction in actual deaths. National Thrombolysis rates increased to 9.5%, one of the highest in Europe, and we aim to increase this by improving rates in smaller hospitals. One of the methods by which we intend to do this is the development of a national telestroke network by which Consultants can advise on patients in distant hospitals remotely over a high resolution video connection. The consultants will also be able to review the patients scans and blood results remotely. The first regional network that will adopt the TRASNA network will be Dublin Mid-Leinster and Consultants from St James's will cross cover with those from Tallaght and Naas Hospitals.

We have recently appointed a new Consultant Neurologist to help provide Stroke Cover in St James's. Our new colleague Dr David Bradley is currently working as a fellow in the Institute of Neurology, Queen Square in London and has been working in the Acute Stroke service of UCL in London. He is expected to take up his role in July.

The stroke service has had a successful year from the Research point of view. Dr Dan Ryan was awarded a research enhancement award by the HRB to help develop his work on Hypotensive stroke and this has allowed us to appoint a new physicist to undertake a study looking at advanced imaging techniques in Borderzone Stroke. Dr Ryan also won best poster award at the British Geriatric Society Autumn Meeting in Harrogate and the Presidents Prize at the 60<sup>th</sup> Irish Gerontological Society Meeting in Cork. We expect the bulk of his research findings to be published this year.

Dr Clare Crowe has recently been awarded her Doctorate of Psychology from Trinity on the basis of research carried out in the Department. The research which was the first qualitative study looking at fatigue and anxiety in people after stroke has produced new insights into the condition and will be followed up on by a new psychology doctoral candidate starting shortly.

Apart from these, the Stroke service has had more than 20 research presentations accepted at national and international meetings over the course of the last year on topics as diverse as sleep disorders in stroke patients to carotid disease in the over 90s.



Educationally the service has continued to provide training to students from Trinity College Dublin and has also contributed to the Royal College of Physicians Post Graduate Diploma in Stroke and to the Masters in Gerontological Nursing and in Physiotherapy in both Trinity College Dublin and Royal College of Physicians in London. We have had elective students join us from the UK, France and the United States and Prof. Harbison will be extending his teaching role to give workshops in Neuroanatomy for Trinity College Students.

Our annual national study day for Stroke Nurses was organised by Suzanne Walsh, Olivia Mahon and Lisa Masterson. This event has gone from strength to strength and in 2012 a second study day had to be scheduled to cater for the volume of applications. We had a range of speakers from the Mercer's Institute, St. James's Hospital and beyond. Feedback on the days' presentations was extremely positive.

We are also working to develop the new Masters in Gerontology for Trinity College Dublin, which, we hope, will be predominantly web based and will enable students from multiple disciplines from across the world access our teaching facilities.

Finally Professor Harbison and Professor Kenny have been working to help establish the University of the Third Age in Ireland (U3A). This is an initiative supported by Trinity and Age Action Ireland to help retired people and those approaching retirement form groups to allow them continue with their personal development, providing speakers on a range of subjects and other activities including recreational visits, book clubs etc. We have organised a national U3A conference for April in Trinity College Dublin where Dr Mary Robinson and Prof Rose Anne Kenny will be guest speakers.

## **Medical Physics and Bio-Engineering [MPBE]**

The engineering group at MIRA works on projects involving technology for supporting ageing in place and technology used in the clinical assessment of older people. ActivAge 2012 was a landmark event for MIRA and the engineering group, bringing together older people and technology experts for a series of public engagement events as part of Dublin City of Science. ActivAge 2012 is part of a longer term strategy of building an environment where clinicians, engineers and older people can work together to design and evaluate technology that will have a positive impact on older people's lives. The event strengthened and created links with local community groups and other institutions, helping build a network for future collaborations. In particular, arising from contacts between the MIRA engineering group and the Digital Hub, St. James's has launched a joint access programme on Connected Health Technology with the Digital Hub. This programme will engage small digital companies in solving technological problems of clinical interest. This collaboration will serve as a model for the technology design and evaluation platform at MISA.

The engineering group at MIRA is built on collaboration with the Dept. of Medical Physics and Bioengineering (MPBE) at St. James's and consists of Dr. Gerard Boyle, Dr. Ciarán Finucane, Tim Foran, Fran Hegarty, Emer Kenny and Dr. Chris Soraghan. A summary of the group's activities in 2012 follows:

## **Outreach: ActivAge 2012**

*ActivAge 2012: Exploring Technology for Successful Ageing* was a Dublin City of Science event organised by the MIRA/MPBE engineering group, partnering with the South Inner City Community Development Association (SICCCA), the Digital Hub and the National College of Art and Design (NCAD). *ActivAge 2012* was supported by a 20,000 euro grant awarded to the MIRA/MPBE group from the Dublin City of Science, anchor sponsorship from Philips and through the assistance of MIRA, MPBE and the Dementia Services Information and Development Centre (DSIDC). The event culminated in a public seminar at the Guinness Storehouse on the 3<sup>rd</sup> November with invited international and national expert speakers on technology for older people. An important aspect of *ActivAge 2012* was the direct involvement of older people in individual projects taking place throughout the year, the outcomes of which were presented at the *ActivAge 2012* seminar. These projects were:

- (i) “*From the group up*”: Ideas for novel services for older people in the Liberties, generated by NCAD students who explored the area and engaged with local older people.
- (ii) “*Red light/Green light*”: A short drama piece exploring the utilisation of pendant alarm systems by older people in the Liberties and based on the output of a research project carried out by MIRA/MPBE and commissioned by the National Disability Authority (NDA).
- (iii) “*Imagined Companion*”: An artwork commissioned for *ActivAge* exploring ethical aspects of a future robotic companion.
- (iv) “*Hack it!*”: A collaboration with Tallaght Men’s Sheds and Silver Surfers, MPBE and Science Gallery exploring older people’s ingenuity in redesigning common household tools.
- (v). “*My Favourite Things*”: Based on a series of discussions with older women in the Liberties on their favourite objects, this project led to the creation of a striking interactive artwork capturing the importance of including older people’s in the process of technology design.

In addition to these projects, *ActivAge 2012* also hosted a screening of the documentary movie “Squeeze me: Robots in Dementia” at the Science Gallery and the screening of a CARDI sponsored video short on intergenerational aspects of ageing.

## **Education**

MPBE and MIRA were represented on the teaching faculty for the Canadian Summer Program in Ageing in Vancouver by Dr. Gerard Boyle. The summer school topic for 2012 was technology for older people. The summer school is directed by the Canadian Institute Health and Simon Fraser University, with CARDI supporting the Irish tutors and students who took part.

Dr Christopher Soraghan was awarded a place on the 2012 FLARE Summer School Programme on Ageing in Galway.

## **Technology Design and Application**

*NDA contract*: The MPBE/MIRA group won a 25,000 euro research contract from the National Disability Authority (NDA) to carry out a project on “Universal Design for Older People”. The work was carried out by Dr. Chris Soraghan and Dr. Sonja Hermann, in collaboration with SICCCA. Over 30 homes in the Liberties area were visited to assess older users’ experiences with everyday consumer technologies. The work will be published as an NDA report.

*Mobile App Development:* Dr Christopher Soraghan, working with colleagues in the engineering group and the SJH Speech and Language Therapy Dept., has designed and implemented a communication aid for stroke patients. The aid runs as an app on an iPad and enables patients with speech difficulties to communicate via a picture driven speech synthesiser.

The design process behind this work was presented at the IGS Conference in Cork. Feedback from end user stroke patients is being used to refine the app design. Christopher was awarded the Young Investigators Grant (1,500 euro) from the Irish Association of Physicists in Medicine (IAPM) to support the design and development of mobile Health (mHealth) applications.

Christopher is working with Tim Foran on the design of a gait assessment app, which ranks inputted gait parameters against normative data acquired in the TILDA project. Christopher is also working with Dr Roman Romero-Ortuno (MIRA and St. Vincent's Hospital) on an app to calculate frailty index.

*Nurse Call System:* A bespoke wireless nurse call system designed to complement the aesthetics of the 'Home from Home' environment has been introduced in the Hospital 4 Day Room in SJH. The device has the appearance of an old fashioned rotary dial phone and was designed and built by Dr Christopher Soraghan.

*Falls Detection Technology:* Dr Christopher Soraghan, in co-operation with the Occupational Therapy (OT) Department) was awarded an SJH Foundation Small Grant (2,480 Euro) for the purchase of falls detection and prevention equipment for . A series of trials of this equipment will be carried out in early 2013.

*Digital Hub Initiative:* Growing from the *ActivAge* project and from the MISA technology test bed concept, St. James's Hospital and the Digital Hub have initiated a joint access programme to enable clinicians and technology experts to work on the design and test of digital technologies to support health.

*Ocular Microtremor (OMT):* Ocular Microtremor (OMT) is a high frequency eye movement carrying useful clinical data. Dr. Niamh Collins successfully defended her PhD thesis "*Ocular Microtremor as a Clinical and Scientific Tool in Neurologic Disease, Validation and Application of a Generalised Discovery Protocol*" for examination. Emer Kenny continued her Ph.D. research in OMT and demonstrated OMT measurement in an vitro simulator, using a non contacting laser system she has designed.

*Gait & Balance:* Tim Foran continued his Ph.D. investigation into gait and balance dynamics and their relationship to Falls Risk. The Ph.D. investigation aims to derive novel biomarkers of gait impairment in older people that indicate increased Falls Risk.

### **Biomedical Signal Processing**

The group is engaged on a number projects designed to help maximise the utility of information derived from clinical measures of physiological performance and health, such as blood pressure waveforms and ECG signals. These signal processing projects include:

#### *Active Stand BP Analysis*

Beat-to-beat blood pressure recordings acquired during 'Active Stand' clinical tests can be contaminated with noise. A software algorithm had been written to automate removal of this noise and this software enables TILDA researchers speed up analysis of the large quantity of Active Stand data acquired in the TILDA project (C. Soraghan / C. Finucane Dr Mimi Fan (Mater Hospital)).

#### *Active Stand BP Record Viewer*

A software programme was written to facilitate the efficient viewing and analysis of blood pressure records from the TILDA dataset. The graphical user interface (GUI) allows for rapid prototyping of new signal analysis techniques and extracts blood pressure parameters of interest to researchers. (C. Soraghan/C. Finucane/ Dr Mimi Fan (Mater Hospital).

#### *NCVI Study Research and Support*

The group assisted blood pressure data preparation and analysis for the Neurocardiovascular Instability longitudinal study at MIRA. This work has also informed and improved the TILDA Active Stand Protocol (Dr Ciarán Finucane/ Dr Christopher Soraghan/ Tim Foran /Dr Mimi Fan (Mater Hospital)/Dr. Tomoaki Hayakawa).

#### *Syncope-Stroke Project Signal Processing*

Group members are working with Dr Daniel Ryan on processing of phasic blood pressure and heart rate data for his study on stroke and syncope correlates. This work was been presented at IGS 2012 and BGS 2012 and submitted to this year's European Society of Cardiology Conference 2013.

#### **Biomedical Engineering at TILDA**

In collaboration between MIRA Bio-engineering staff and the Department of Medical Physics at St James's hospital and the TILDA team, a TILDA Biomedical Engineering team has been established. The overarching goal of TILDA's Biomedical Engineering team is to complement the clinical, research and education activities in MIRA and TCD in the research, design, development and validation of medical devices and tools to support positive ageing at a population health level. Dr. Hugh Nolan joined the team in October 2012. Dr Nolan brings his experience in neural engineering, signal processing and technology development to the team.

TILDA's Biomedical Engineering Team focuses its activity on data analytics and on technologies for population health.

TILDA: innovation in data analytics.

Devising novel and sensitive predictors of future health outcomes is key to future population health. TILDA's biomedical engineering team is exploring the development of novel mathematical tools for physiological signal and data analytics grounded in a sound understanding of physiological processes.

#### *'FIBSCAN' – Faster Electrode Free Atrial Fibrillation Detection*

Ciarán Finucane, as part of on-going TILDA Biomedical Engineering work has developed a software algorithm - FIBSCAN for detecting atrial fibrillation from body worn sensors and mobile phones. Atrial Fibrillation (Afib) is an abnormal heart rhythm and a known risk for stroke. It is under diagnosed in the population, particularly in older men. Tests show the algorithm has a high sensitivity and specificity for AFib detection and has a role in screening for AFib using low cost monitoring technology. A US patent has been filed through Trinity College Dublin. FIBSCAN is now available for license through TCD.

This work has been showcased at TCD annual Enterprise Ireland Innovation Showcase and has attracted interest from multiple business partners and featured on a radio programme. Ciarán is currently exploring routes to commercialise this technology, and is exploring partnerships and licensing opportunities with companies and granting bodies to maximise the impact of this technology on population health.



#### *Physical Activity and Sleep Monitoring*

Dr. Hugh Nolan and Dr. Ciarán Finucane have recently completed a study on measuring physical activity and sleep in older adults over prolonged periods using a novel wrist worn monitor. A data analytics framework has been implemented to enable efficient data analysis of 7 day activity periods and provides estimates of physical and sleep suitable for large scale data repositories. This measure is currently being considered for inclusion in Wave 3 of the TILDA study.

#### *Vision, Macular Pigment and Cognitive Health*

Dr. Ciarán Finucane in collaboration with Dr. Joanne Feeney and Dr. John Nolan has been examining the role of measures of macular pigment in cognitive function. Their recent work indicates that carotenoids of the eye may reflect concentrations of carotenoids in the brain. Non-invasive measures of macular pigment optical density may prove to be a future novel non-invasive biomarker of cognitive function.

#### *TILDA: Innovation in population health technologies.*

TILDA's biomedical engineering team is exploring novel ways of capturing and analysing metrics of population health using connected health technologies, such as mobile phones and tablets. Enabling easy capture of health information at a population level is key for future cost effective population health management.

#### *'FIBSCAN' Mobile Phone APP Development*

Dr. Ciarán Finucane and Dr. Hugh Nolan have recently developed a novel Android application which uses the FIBSCAN algorithm to allow patients to easily check for the presence of atrial fibrillation without the need for ECG using a mobile phone or tablet PC. The current version of the application may be suitable for use in community pharmacies as a simple screening tool for atrial fibrillation.

#### *HRB ICE Grant Award*

TILDA Biomedical Engineering in collaboration with TILDA PI's Prof Rose Anne Kenny played a pivotal role in securing a HRB Interdisciplinary Capacity Enhancement (ICE) award to study the role of autonomic function in the development of cardiovascular disease in adults in order to identify new biomarkers and opportunities for intervention.

#### *Neurocardiovascular Working Group*

Dr Ciarán Finucane and Prof Rose Anne Kenny established a working group in TILDA in 2012 focussing on the role of Neurocardiovascular Instability across health, social, economic domains. The established team of 15 plus researchers in TILDA consists of engineers, clinicians, physiologists, mathematicians, statisticians examining the role of neurocardiovascular function in health. A number of working papers examining methodological and measurement issues, physiological mechanisms and clinical diseases related applications are in progress.

#### *Bioengineering and TILDA Education*

Mr Eoin Duggan under the supervision of Dr. Ciarán Finucane and Dr. Hilary Cronin was awarded a HRB Summer Student Scholarship Grant (3,000 euro) for an 8 week research project investigating the influence of vision on falls and fear of falling. Mr Duggan's research developed analytics software to enable the analysis of large scale population databases of physiological information. His research also indicates that contrast sensitivity maybe a more important sensory factor to measure in those with gait disorders than visual acuity. This work was presented at the BGS and IGS in 2012.

Mr John Frewen received 1<sup>st</sup> Prize Best Poster at the National Stroke Conference 2012 for his work describing the epidemiology of Atrial Fibrillation in Ireland. John recently completed the first intercalated Masters in Biomedical Engineering from TCD under supervision of Dr. Ciarán Finucane, Dr. Joseph Harbison and Prof. Rose Anne Kenny, John is now undertaking PhD studies in TILDA examining the cross-sectional relationships between Cognition and Neurocardiovascular Instability.

Three new MSc student places in Biomedical Engineering have been allocated to TILDA this year. The successful applicants will research population health related projects in the area of data analytics, neurocardiovascular modelling and measurement.



### Technology Research for Independent Living (TRIL)

#### Background:

Technology Research for Independent Living (TRIL) is a collaboration between researchers in academic, clinical and industry settings. TRIL was founded in 2007. It operates as a centre with researchers based in University College Dublin, Trinity College Dublin, St. James's Hospital and a range of industry partners including , Intel and GE Healthcare. The centre uses multidisciplinary research, clinical expertise, technology development and evaluation to support independent living. The TRIL Clinic is an assessment unit which is based in St. James's Hospital, Dublin.

#### Update on TRIL Clinic Assessments 2012

During 2012 the TRIL clinic recruited a new cohort of participants to participate in a "Quantitative falls risk assessment through gait, balance and perceptual measurement in elderly fallers and controls".

#### Sub studies:

- Sub study 2: Validation of a psychosocial distress index.
- Sub study 3: Exploring user perspectives on assistive and health technologies.
- Sub study 4: Evaluating a caregiver support tool.
- Sub study 5: In-home balance assessment.

The main aim of the study was to individually evaluate a number of walking, balance and frailty assessments technologies among people who have had a least one fall in the last 12 months and those who have not fallen in the last 12 months. The secondary aim was to compare these technologies and to identify if one or a combination of them are more valuable than others in the identification of persons at risk of falls. Finally, the usability and reliability of each of the technologies were evaluated in the clinical setting. 132 participants, fallers and non fallers participated in the study. All participants were over the age of 65. Most participants (90) were recruited through Active Retirement groups. The remaining cohort were recruited from the Falls and Blackout Unit, St. James's Hospital.

Participants were invited to participate in a short telephone interview prior to the clinical assessment to ascertain information about:

Falls status

Health care Utilisation

Living status to include activities of daily living and Physical self Maintenance Scale.

#### **TRIL Clinic Assessment :**

Participants were invited into the TRIL clinic for a quantitative falls risk assessment where a frailty assessment involving weight and height, grip strength measurements, cognitive assessment, perceptual measurements of vision and hearing, balance and mobility assessment using android technology, mood and well being and details of medical and surgical history were collated. The assessment in the clinic was nurse and doctor led. A number of participants needed to be referred on for further clinical services ranging from Memory Clinic, Physiotherapy, Audiology, Falls and Blackout Unit, Psychiatry and Care of the Elderly services.

#### **Validation of a Psychosocial distress Index:**

130 participants completed the psychosocial distress index in the TRIL clinic. Older adults are at an increased risk of psychosocial distress due to loneliness, isolation, depression and anxiety. The questionnaire was a self reported assisted or independent tool aimed to test the reliability and validity of a new assessment scale designed to measure psychological distress.

#### **Exploring user perspectives on assistive and health technologies:**

This Sub study explored the perspectives of users about how assistive and health technologies can help support them in their daily life. It will also help inform designers, engineers and the broader research team of new technology's challenges and potential solutions, a third of the cohort participated in this study with the TRIL ethnographers giving valuable feedback on their interaction with the technology during the clinical assessment.

#### **Evaluating a caregiver support tool:**

This sub study explored how technology can help caregivers living with a person with dementia. The overall objective is to develop a computerised index for tracking the psychosocial wellbeing of spouse caregivers living with a person with dementia and to develop a computerised tool for recording self-rated mood , self-efficacy and quality of life, this study was conducted by Dr. Joanna Mc Hugh and Tim Tim Sung.

#### **Home Balance Assesment:**

18 participants from the original 2012 cohort of 132 participated in this sub-study with the TRIL physiotherapist Dr. Katie Sheehan. All of the participants were non-fallers. The objective of this study is to use the latest sensor technology and data analysis methods to investigate if a one off measurement performed in the clinic is truly reflective of balance capabilities and to investigate if daily variations in in-home balance measurements are different.

#### **November 2012:**

Dr. Celia O'Hare and Tim Foran completed the ' Magnetic Resonance Imaging Study of Brain Structure and Function'. This is a subsidiary study of the 'Quantitative falls risk assessment through gait, balance and perceptual measurement in elderly fallers and controls. 10 fallers and 10 non-fallers were recruited from the 2012 cohort to participate in this study to discover what changes occur in the brain during the ageing process and how these relate to walking ability and memory function.



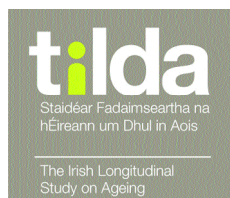
Seán Sherlock, Minister for Research & Innovation visits the TRiL Assessment Clinic

These have included academic and clinical research groups, as well as multinational companies. The pioneering nature of TRIL is such that some have visited with the aim of perhaps creating a TRIL-like entity in their own institutions.

### Period of Transition and change:

In 2012 despite its many successes TRIL has been faced with the same challenges facing the wider economy. Sadly this meant that no further funding was secured for the TRIL Clinic in St. James's to continue on into 2013. However, many of the multidisciplinary team have gone onto further research and new posts bolstered by their previous successes in TRIL.

Further information on TRIL can be obtained from <http://www.trilcentre.org>.



### The Irish Longitudinal Study on Ageing (TILDA)

The Irish Longitudinal Study on Ageing (TILDA) is the most comprehensive study of its type ever conducted in Ireland. Between 2009 and 2011, over 8,000 people aged 50 and over were randomly selected across the country and interviewed about many aspects of their lives including issues such as health, financial circumstances, and quality of life. Almost 85 percent of the participants also underwent a rigorous health assessment.

The background and rationale to the study was described in the 2009 MIRA report. Further details on the study, including the structure of the organisation and researchers involved are available on our website [www.tilda.ie](http://www.tilda.ie). The focus of this report is to provide an initial summary of the project itself, to update readers on the progress of the study and the goals reached in 2012.

### Project description:

A nationally representative sample of over 8,000 adults aged 50 and over, resident in Ireland, was selected using a population sift. The selected addresses were visited by an interviewer from Ipsos MORI and all persons aged 50 or over (and their spouses/partners of any age) were canvassed to participate in the survey.

Fieldwork involved interviews using computer-aided personal interviewing (CAPI) techniques and either a visit by the respondent to a TILDA Health Assessment Centre where appropriate medical measurement facilities were available or a visit to the respondents' home by a qualified research nurse to take physical measurements and bio-medical samples. A self completion questionnaire was also requested of all respondents.

As TILDA has a longitudinal study design, participants in the first wave of the study will have a follow-up interview every two years and a health assessment every three to four years for a ten year period.

### **Major Developments in 2012**

2012 was another busy year for TILDA. Through archiving Wave 1 data at the end of 2012 at the Irish Social Science Data Archive (ISSDA), data is now available to researchers in Ireland and beyond. TILDA Wave 2 commenced in early 2012 and is now almost complete. We expect to have a full Wave 2 data set in early 2013 and so we will be able to begin exploiting the longitudinal nature of the study. TILDA activities can be viewed as falling into three areas: (1) data collection/preparation/dissemination (through ISSDA); (2) research; (3) policy influencing through media and direct contact with policy-makers. Activities under all of these headings are going well.

TILDA has also been carrying out the health assessment component of the SHARE study with a total of 375 participants taking part in 2012; 117 of these took part in a successful repeat health assessment.

### **Fieldwork:**

Wave 2 of The Irish Longitudinal Study on Ageing (TILDA), is nearing completion: 7,447 people aged 50 and older have now completed their interview which involves a 90 minute CAPI questionnaire as well as physical measures of the participants handgrip strength and walking speed. Over 95% of those interviewed completed these tests. Our individual-level response rate (when taking into account the number of people who are no longer available or eligible and those who have withdrawn completely from the sample) is over 87%.

The expected response rate is 85% of the 8,500+ who took part in the first wave in 2010, the results of which are now publicly available through the Irish Social Sciences Data Archive (ISSDA). Please see [www.tilda.ie](http://www.tilda.ie) for more information.

### **Funding and Grants:**

The three main funders of TILDA are the Department of Health, Irish Life and Permanent Plc, and The Atlantic Philanthropies.

TILDA has been awarded a new HRB Interdisciplinary Capacity Enhancement (ICE 2012) award to study the role of autonomic function in the development of cardiovascular disease in adults, thereby creating new biomarkers and opportunities for intervention. A further HRB population health science award for over 3 years was made to study type 2 diabetes and its relation to cardiovascular function, cognitive function, mental health and socioeconomic factors. The National Institute for Health awarded an R21 grant in September for 82,000 euro to cover the SHARE project. A student scholarship for 2,000 euro was also awarded to TILDA by the Health Research Board to cover an 8 week summer studentship to investigate vision, gait and fear of falling. More information on these awards can be found on [www.tilda.ie](http://www.tilda.ie)



### **Collaboration with other MIRA & MISA Staff**

As you will see from earlier pages in this report there is very strong collaborative working relationship between TILDA and the various units in MIRA these include Memory, Falls, Bioengineering. Details of collaborations and personnel are listed under the relevant sections in this report.

### **New Staff:**

New staff hires for 2012 included a Project Manager, a Research and Development Programme Manager, a Health Economist, 2 Social Epidemiologists, a Psychologist, a neuroscience research fellow, health research fellow, a Biomedical Engineer and an Executive Officer.

A new report by The Irish Longitudinal Study on Ageing (TILDA) entitled *Profile of Community-Dwelling Older People with Disability and their Caregivers in Ireland* was launched on 7<sup>th</sup> June 2012. The report highlighted that unpaid care work by older people underpins the Irish care system. Commenting on the findings, Associate Professor in Social Policy and Ageing, Virpi Timonen stated: “Care policy in Ireland is woefully neglectful of the fact that older people provide the bulk of care to other older people”. Additional reports on pensions and healthcare utilisation were published at the end of 2012 - *Supplementary Pensions and the Income of Ireland’s Retirees* and *Polypharmacy in Adults over 50 in Ireland: Opportunities for Cost Saving and Improved Healthcare*. Each of these reports received coverage in the national newspapers and copies are available from the TILDA web site [www.tilda.ie](http://www.tilda.ie)

### **Conferences:**

TILDA took part in the Irish Gerontology Society conference in March 2012. In July Professor Rose Anne Kenny participated in the RAND Summer Institute on Aging in Santa Monica, California as well as European Union Geriatric Medicine Society (EUGMS) in September on the clinical aspects of longevity. She also presented at the English Longitudinal Study of Ageing (ELSA) wave 5 launch conference in London in October and at the ELSI Brazil meeting in Rio de Janeiro, Brazil in November. TILDA research was accepted for presentation at international scientific meetings such as the British Geriatric Society and the Population Association of America. Nine TILDA research fellows took part in the British Geriatrics Society Autumn Meeting at the Harrogate International Centre and TILDA concluded the year by participating in European Year of Active Ageing Third Age conference in Croke Park in December 2012.

TILDA research has also been communicated to policy makers through the media and direct presentations such as to the Seanad Public Consultation Committee

### **Plans for 2013:**

Begin the third wave of the study’s data collection.  
Generate further interest in collaborative research analysis and work.  
Continue to publicise the study both nationally and internationally.  
Publish research documents about the study’s early findings.

## Publications

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## Published Abstracts

Adams N, Bhangu J, O'Hare D, Steen G, Lannon R, Casey MC, Walsh JB.  
*Atypical Femoral Fractures: A Case Series in a Specialised Bone Health Service*  
Ir J Med Sci Volume 181 Supplement 7 Sept 2012

Adams N, Bhangu J, Lannon R, O'Hare D, Fitzgerald K, Casey MC, Thornton E, McEniff N, Walsh JB.  
*Vertebroplasty: A Case Series in a Specialised Bone Health Service*  
Ir J Med Sci Volume 181 Supplement 7 Sept 2012

Barrett A, Mosca I.  
*The Psychic Costs of Migration: Evidence from Irish Return Migrants.*  
Journal of Population Economics.

Coen RA, McCarroll K, Casey M, Walsh JB, Coakley D, Lawlor BA, Scott J, Molloy A, McNulty H, Ward M, McNiffe S, Toohey H, Cunningham CJ.  
*TUDA (The Trinity, University of Ulster and Department of Agriculture Study): RBANS specificity In An Elderly Out-Patient Cohort.*  
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Crowe C, Hevey D, Coen RF, Kidd N, Harbison J, Walsh S.  
*Experience of psychological distress amongst stroke survivors.*  
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Donoghue OA, Cronin H, Savva GM, O'Regan C, Kenny RA.  
*Effects of fear of falling and activity restriction on normal and dual task walking in community dwelling older adults.*  
Gait Posture, Nov 2012

Dunbar E, Lannon R, Browne J, Maher N, Thornton E, Casey MC, Walsh JB.  
*Hip Fracture and Bone Health 2010: An Audit of Assessment, Treatment and Follow-up in a South Dublin Inner City Teaching Hospital*  
Ir J Med Sci Volume 181 Supplement 7 Sept 2012

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*Osteoporosis: A Clinical Nurse Specialist-Led Pre-assessment Clinic*  
Ir J Med Sci Volume 181 Supplement 7 Sept 2012

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*Audit of the use of low molecular weight heparin amongst newly admitted inpatients at a tertiary referral centre*  
Ir J Med Sci. 2012 Vol 181 S7

Fitzgerald K, Steen G, Fallon N, Maher N, Casey M, Cunningham C, Harbison J, Kenny RA, Robinson D, Walsh JB.  
*Parathyroid Hormone Injection: Compliance Rates in PTH 1-34 and PTH 1-84 in a Bone Health Service.*  
Ir J Med Sci Volume 181 Supplement 7 2012

Kennedy C, Robinson D, Romero-Ortuno R, Savva G, O'Shea D, Kenny R, O'Shea D, O'Connell J.  
*Functional capacity and frailty of metabolically healthy obese older persons*  
British Geriatric Society, Autumn 2012

Kennedy C, Robinson D, Romero-Ortuno R, Savva G, O'Shea D, R Kenny, D O'Shea, J O'Connell  
*Cognitive outcomes of metabolically healthy obese older persons*  
British Geriatric Society, Autumn 2012

Kennedy C, Romero-Ortuno R, Robinson D, O'Shea D, Kenny RA, O'Connell J.  
*Cognitive Outcomes of Metabolically Unhealthy Obese Older Persons*  
Ir J Med Sci. 2012 Vol 181 S7

Lannon R, O'Keeffe L, Fallon N, Casey MC, Walsh JB.  
*Strontium Ranelate in Male Osteoporosis*  
Ir J Med Sci Volume 181 Supplement 7 2012

Lannon R, Robinson V, Fitzgerald C, Fitzgerald K, Casey MC, Walsh JB.  
*Denosumab: Identification and Tolerability in an Irish Bone Health Clinic Population*  
Ir J Med Sci Volume 181 Supplement 7 Sept 2012  
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*A Study of PTH Response to Hypo-vitaminosis D in a Specialised Bone Health Clinic*  
Ir J Med Sci Volume 181 Supplement 7 Sept 2012

Maher N, Quinn A, Steen G, Fallon N, Fitzgerald K, Browne, J, Casey M, Walsh JB,  
*IV Zoledronic Acid: Indications for its administration and its tolerability following first dose*  
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Mahon J, McCarron E, Robinson V, Drumm B, Fitzgerald K, Walsh JB, Casey MC.  
*The Occurrence of Hypercalcaemia in Patients commencing Recombinant Parathyroid Hormone (1,34) Therapy.*  
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*Surveillance of 24 hour urinary calcium in patients commencing recombinant PTH (1-34) therapy*  
Bone Volume 50, Supplement 1.

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*What are the Risk Factors associated with Colles Fractures in the Elderly?*  
Ir J Med Sci Volume 181 Supplement 7 Sept 2012

McCarroll K, Casey M, Walsh JB, Scott J, Molloy A, Healy M, McNulty H, Strain JJ, Cunningham C.  
*Vitamin D and Falls: Exploring the Relationship in Older Adults.*  
Ir J Med Sci, 2012 Volume 181 Supplement 7.

McCarroll K, Sweeney E, Monaghan T, Coen R, Sheehy N, Cunningham C, Walsh JB, Lawlor B.  
*FDG-PET Imaging in a Memory Clinic: A Useful Diagnostic Tool?*  
Ir J Med Sci, 2012 Volume 181 Supplement 7.

McCarroll K, Walsh JB, Coakley D, Casey M, Harbison J, Robinson D, Murphy C, Oxley J, Kenny RA, Cunningham C.  
*Discharge of patient to long-term care from a large acute hospital over a 12 year period*  
Irish Journal of Medical Science 2012 Dec 8. PMID 23225068

McCarron L, Bhangu J, Robinson D  
*Utility of online referral systems for medical gerontology*  
Ir J Med Sci. 2012 Vol 181 S7

Naureen M, Ahmed SR, Siddique N, McCarrol K, Casey MC.  
*The effect of Intravenous Zoledronic Acid on bone Mineral Density in an Elderly Population.*  
Osteoporosis International March 2012, Volume 23, Issue: 2 Supplement, pp 85-386

O'Hare D, Bhangu J, Adams N, Fallon N, Thornton E, Casey MC, Walsh JB.  
*The Utility of Heel Ultrasound in Diagnosis of Osteoporosis in Colles Fracture and Its Correlation with DXA Scanning*  
Ir J Med Sci Volume 181 Supplement 7 Sept 2012

O'Keeffe L, Lannon R, McCarroll K, Walsh JB.  
*A Review of Calcaneal Quantitative Ultrasound (QUS) with Bone Densitometry T- scores in patients with a Hip Fracture Attending a Bone Health Clinic*  
British Geriatric Society Autumn Meeting, Harrogate, Nov 2012

O'Keeffe L, Murphy N, Lannon R, Fallon N, Casey MC, Walsh JB.  
*Utility of Testing for Monoclonal Bands in Serum of Patients referred to a Bone Health Clinic.*  
J Bone Miner Res. 2012;27 Suppl 1:S1. doi: 10.1002/jbmr.1852

O'Sullivan M, Kim Cheung (Philip) Ng, Mahon J, Steen G, Maher N, Walsh JB, Casey MC.  
*Colles Fractures: A Study of Patients from a Hospital Bone Database*  
Ir J Med Sci Volume 181 Supplement 7 Sept 2012

Robinson D, Arrigan M, Gaughan M, Feighan J, Boyle G, Rigby J, Kenny RA.  
*Long-term care in Dublin City and County - does service provision match mapped need?*  
Ir J Med Sci. 2012 Vol 181 S7

Robinson D, Chin AV, O'Connell H, Hamilton F, Bruce I, Coen R, Scott J, Molloy A, Lawlor B, Cunningham C.  
*Instrumental activities of daily living and their relationship to diet and vitamin levels: the Dublin Healthy Ageing Study*  
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Robinson V, Lannon R, Fitzgerald C, Azam J, Fallon N, Casey MC, Walsh JB.  
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Savva GM, Donoghue OA, Horgan F, O'Regan, Cronin H, Kenny RA.  
*Using timed up-and-go to identify frail members of the older population.*  
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Siddique N, Cheung NK, Bennett K, Lannon R, Quinn A, Harney C, Casey MC, Walsh JB.  
*Zoledronic Acid in Osteoporosis: Who Responds Better?*  
Ir J Med Sci Volume 181 Supplement 7 Sept 2012

Siddique N, Cheung NK, McCarroll K, Fallon N, Casey MC, Walsh JB.  
*Identifying Factors Involved in Predicting Response to Intravenous Zoledronic acid in Elderly Patients with Osteoporosis.*  
J Bone Miner Res. 2012;27 Suppl 1:S1. doi: 10.1002/jbmr.1852

Siddique N, McAnallen S, Sweeney J, Steen G, Walsh JB, Casey MC.  
*Hypercalciuria as an Overt Cause of Renal Stones and Covert Cause of Osteoporosis*  
Ir J Med Sci Volume 181 Supplement 7 Sept 2012

Siddique N, O'Hare D, Quinn A, Walsh J, Byrne T. Casey MC, Walsh JB.  
*IV Bisphosphonates in Osteoporosis: Is Full Dose of Zoledronic Acid Really Necessary?*  
Ir J Med Sci Volume 181 Supplement 7 Sept 2012

Steen G, Fallon N, Fitzgerald K, Maher N, Casey M, Harbison J, Kenny RA, Robinson D,  
Walsh JB, Cunningham C.  
*Implementing a Hospital Falls Management Programme in a major academic hospital*  
Ir J Med Sci Volume 181 Supplement 7 2012

Steen G, Maher N, Fitzgerald K, Fallon N, Casey M, Coakley D, Harbison J, Kenny RA, Walsh  
JB, Cunningham C.  
*Prevention of Falls among older patients in the hospital environment - a nurse led prevention  
programme.*  
Osteoporosis International March 2012, Volume 23, Issue 2 Supplement.

## Invited Lectures

Prof Rose Anne Kenny  
ELSI – Brazil International Workshop  
“Harmonisation with the HRS family: physical health measures: Rose Anne Kenny, The Irish  
Longitudinal Study on Ageing (TILDA)”  
Rio de Janeiro, Brazil  
12-13 November 2012

Dublin City of Science – Activage 2012  
“Challenges and Possibilities of Successful Ageing”.  
Dublin Guinness Storehouse.  
3 November 2012

ELSA (English Longitudinal Study of Ageing ) International Consultants Meeting  
“TILDA”  
London  
16 October 2012

EUGMS  
“Clinical aspects of longevity”  
Brussels  
27 September 2012

Heart Rhythm Congress.  
“A multidisciplinary approach to identifying syncope in the elderly”  
Birmingham  
25 September 2012

European Cardiac Society  
“Syncope Clinic and interactive decision making softwares”  
Munich  
28 August 2012



RAND Institute 2012 Mini-Medical School for Social Scientists  
“Understanding Falls and Ageing”.  
RAND Headquarters  
Santa Monica, California  
10 July 2012

Age Action 20th Anniversary AGM  
“TILDA”  
Croke Park, Dublin  
29 June 2012  
ICEM – International Conference on Emergency Medicine  
“Investigation and management of syncope in the Emergency Department”  
Dublin Convention Centre  
28 June 2012

Oxford RAND workshop  
“TILDA”  
Oxford Institute of Population Ageing  
University of Oxford  
25 June 2012

Cardiostim 2012 19th World Congress Cardiac Eletrophysiology & Cardiac Techniques  
“Syncope in the Elderly”  
Nice, France  
15 June 2012

Irish Congress of Anaesthesia  
“TILDA”  
Dublin Convention Centre  
25 May 2012

FEAM (Federation of European Academies of Medicine.  
“Impact of ageing on public health policy in Europe”  
Royal Medical Academy of Spain  
5 May 2012.

UK Society for Acute Medicine  
“Falls”  
Radisson Blu Hotel, Dublin  
4 May 2012

Europrevent – European Cardiovascular Conference  
Trends in risk factors in middle and older years: with regards to TILDA Study”  
Dublin Convention Centre  
2 May 2012

Irish Heart Foundation Council on Stroke  
“TILDA 50+ in Ireland – Profiling Cardiovascular risk and the implications for management”  
Croke Park  
20 April 2012

International Congress on Gerontology & Geriatric Medicine  
“Evaluation and prevention of Falls”  
New Delhi, India.  
24 - 28 February 2012

St. Vincent’s Hospital Association of Clinical Biochemistry  
“NCVI in ageing”  
St. Vincent’s Hospital  
27 January 2012

GP Lecture  
“Management of Falls & Blackouts”  
TCD Health Sciences  
21 January 2012

Dementia Strategy Conference  
“An update on Gait falls and exercise in dementia”  
TCD Science Gallery  
18 January 2012

### **Other Conferences at which MIRA staff presented**

McLarnon E, Robinson D.  
Elder Abuse  
GP Forum, Feb 2012

C Finucane, J Browne, R Kenny, H Cronin, J B Walsh.  
*Estimating the Accuracy of FRAX in an Irish Population.*  
British Gerontology Society, International Conference, 2012.

J Frewen, C Finucane, H Cronin, C Rice, P Kearney, J Harbison, R Kenny.  
*Prevalence and Awareness of Atrial Fibrillation and estimated stroke risk.*  
European Stroke Conference, 2012

J Frewen, C Finucane, H Cronin, C Rice, P Kearney, J Harbison, R Kenny.  
*Use of antithrombotic therapy in subjects in Atrial Fibrillation in TILDA.*  
European Stroke Conference, 2012

J Frewen, C Finucane, H Cronin, C Rice, P Kearney, J Harbison, R Kenny.  
*Increased levels of Alcohol Intake are associated with Atrial Fibrillation in Ireland: Findings from The Irish Longitudinal Study on Ageing (TILDA).*  
Irish Heart Foundation National Stroke Conference, 2012.

E Duggan, C Finucane, H Cronin, R Kenny.  
*Vision, Falls, and Gait.*  
Irish Gerontology Society AGM 2012

E Duggan, C Finucane, H Cronin, R Kenny.  
*Contrast Sensitivity, Falls, and Gait.*  
British Gerontology Society, International Conference, 2012.

J Feeney, C Finucane, G Savva, J Nolan, R Kenny.  
*Macular Pigment Optical Density is Associated with Cognitive Function in a Large Nationally Representative Sample of Older Irish Adults.*  
British Geriatric Society (BGS) 2012.

## Partnerships

### **St. James's Hospital**

Medicine for the Elderly  
Psychiatry for the Elderly  
Clinical Biochemistry  
Clinical Medicine  
Palliative Care  
Infectious Diseases  
Rheumatology  
Orthopaedics  
Gastroenterology  
Hepatology  
Haematology  
Renal Medicine  
Endocrinology  
Histopathology  
Dementia Services Information and Development Centre

### **Trinity College Dublin**

Department of Medical Gerontology  
Department of Psychiatry  
Department of Old Age Psychiatry  
Department of Psychology  
Department of Bioengineering  
Department of Mechanical Engineering  
Department of Statistics  
Department of Sociology  
Department of Anatomy  
Trinity College Institute for Neurosciences

### **Tallaght Hospital (AMiNCH)**

Age Related Health Care, Adelaide and Meath Hospital incorporating The National Children's Hospital, Tallaght, Dublin

Department of Psychiatry of Later Life, Adelaide and Meath Hospital incorporating The National Children's Hospital, Tallaght, Dublin

### **Royal College of Surgeons in Ireland (RCSI)**

Department of Anatomy

### **St. Patrick's Hospital**

### **University College Dublin**

Conway Institute  
Department of Veterinary Medicine

