

Mercer's
Institute
for
Research
on
Ageing

Annual Report 2011



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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
Mr. Desmond Dempsey
Dr. Miriam Casey
Prof. Joseph Harbison
Dr. Elaine Green
Dr. David Robinson
Ms. Carol Murphy (Administrator)

Watt's Clinical Research Fellow

Dr. Kevin McCarroll

Memory Clinic Research Fellows

Dr. Aíne Ní Mhaolain
Dr. Eileen Sweeney

Lecturer

Dr. Bláithín Ní Bhuacalla

Falls and Osteoporosis Unit

Dr. Rosaleen Lannon

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. Dympna Hade
Ms. Lisa Byrne	Ms. Ciara Rice

Senior Radiographer

Ms. Eilish McDermott

Ms. Sophie Toth

Medical Physics and Bio-Engineering

Dr. Gerard Boyle

Dr. Ciarán Finucane

Ms. Emer Kenny

Technology Research for Independent Living (TRIL)**Project Team:****Lead Principle Investigators:**

Prof. Rose Anne Kenny

Prof. Brian Lawlor

Prof. Richard Reilly

Prof. Ian Robertson

Dr. Brian Caulfield, Research Director

Dr. Mimi Fan, Clinical Director

Dr. Aisling O'Halloran, Senior Researcher

Dr. Joe Wheaton, Senior Researcher

Dr. Patrick Corley, Clinic Programme Manager

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

Dr. Hilary Cronin, Medical Director

Mr. Ian Clifford, Survey Manager

Mr. Conor Moody, Data Manager

Dr. George Savva, Biostatistician

Health Research Fellows:

Dr. Aisling O'Mahoney

Ms. Claire O'Regan

Dr. Ciaran Finucan

Economics Research Fellows:

Dr. Irene Mosca

Dr. Vincent O'Sullivan

Social Research Fellow:

Dr. Yumiko Kamiya

Executive Officers:

Ms. Jacinta O'Grady

Ms. Pauline Walsh

Ms. Jennifer Erangey

Ms. Patricia Birch

Ms. Sarah Jones

Ms. Orla McBride

Research Nurse Manager:

Ms. Niamh Dunphy

Research Nurses:

Ms. Patricia Costello

Ms. Sandra McGrath

Ms. Laura Dunne

Ms. Lorna Greene

Ms. Sally Couper

Ms. Roisin Nevin

Ms. Anne Hughes

Ms. Ann Marie Kenny

Ms. Tara Frayne

Ms. Nollaig Baker

Ms. Coleen Sweeney

Ms. Carol Anne O'Shea

Ms. Tracey Quinn

Ms. Kay Poland

Ms. Debbie Hurley

HRB Translational Study Team:

Prof. Michael Rowan, Dept. of Pharmacology TCD
Dr. Orla Collins, Clinical Research Fellow
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:**

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

**Enhancing Care in Alzheimer's Disease Study (The ECAD Study)
Dr. Kevin McCarroll****Adjunctive Protein Supplementation in Osteoporotic Patients Treated with Recombinant
Parathyroid Hormone**

Principle 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
Dr. L. Cogan
Dr. S. Ni Bhrian
Dr. H. O'Connell
Dr. D. O'Mahony
Dr. G. Swanwick
Dr. D. Hennelly
Dr. Hilary Cronin
Dr. T. Coughlan
Dr. S. Kennelly
Dr. D. Robinson
Dr. C. O'Luanaigh
Dr. N. Collins
Dr. S. Squires
Dr. Guan Choon Chan
Dr. C. O'Dwyer
Dr. J. Browne

Medical Physics & Bio Engineering

Dr. M. Al-Kalbani

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

2011 was another eventful year for the Mercer's Institute for Research on Ageing. All areas of the Institute has shown increasing research and clinical activity. We were also joined by Dr David Robinson as a new consultant. Dr. Robinson was a previous Watts Fellow in the Mercer's Institute where he undertook his MD thesis research in the MIRA Memory Clinic. He replaces Professor Davis Coakley.

Professor Brian Lawlor is the lead investigator with the Nilvad consortium which will look at the effect of Nilvadipine in reducing the risk of developing dementia and Alzheimer's disease. This is a major study which it is receiving significant support from the European Commission FP7 Research Framework Programme. We are very appreciative of the support which Professor Lawlor has received from St. James's Hospital in progressing and taking the lead in this study.

An earlier study on Nilvadipine was carried out in the Mercer's Institute by Dr. Sean Kennelly who was recently awarded a Ph.D for his work on Nilvadipine in Alzheimer's Disease and Dementia. This is a superb example of how seed work in the Mercer's Institute has led to a major international study in an area that is greatly in need of new therapeutic options.

Our Watts Research fellow Dr Kevin Mc Carroll leads the main clinical research on the St. James's Hospital campus on the TUDA Study (Trinity, University of Ulster, Department of Agriculture Study). The primary aim of the study is to create a nutritional genotype/phenotype database of community dwelling subjects aged over 50 on the island of Ireland both north and south focusing on a variety of age related diseases. The study is looking particularly at patients with cognitive impairment, osteopaenia and osteoporosis.

Dr. Conal Cunningham is the lead investigator on the TUDA study working with Dr. Miriam Casey, Professor J. Bernard Walsh and Professor John Scott in collaboration with our colleagues from the University of Ulster and the Department of Agriculture.

Dr. Rosaleen Lannon has taken over the clinical bone fellow post from Dr. Joe Browne who has just been awarded an MD for his work on Vitamin D and on Hip Fractures. Dr. Lannon's MD work will focus on the bone component of the TUDA research.

We also have two ongoing studies in the use of Parathyroid Hormone in patients with advanced osteoporosis. PTH is a potent anabolic bone agent which has been very successful in the treatment of patients with advanced osteoporosis.

In the Technology Research for Independent Living 2 (TRIL) clinic in which Professor Rose Anne Kenny is the lead clinical researcher a new clinical protocol was introduced in July 2011 and it is re-looking at patients who were originally assessed in 2007 and 2009. These patients are undergoing further evaluation of their gait, balance, cognition, perceptual function and mental health. This Longitudinal element will allow researchers detail how this cohort is ageing in each of these vital parameters.

Our Stroke unit continues to expand its activity both clinically and in research under the dynamic leadership of Professor Joe Harbison. Dr. Carl Boyle our Clinical Stroke Fellow has joined Dr. Dan Ryan our HRB Stroke Research Fellow in the Stroke unit.

Dr. Ciaran Finucane from Medical Physics received his PhD from Trinity College in January. His Ph.D was co-supervised by Dr. Gerry Boyle and Professor Rose Anne Kenny. Part of the work for his Ph.D entailed developing a computational model of the cardiovascular system which aids our understanding of the aetiology of Carotid Sinus Syndrome and will help to optimise its diagnosis and therapy.

Dr. Tim Foran continues his Ph.D research and Emer Kenny is continuing her SFI funded research into non contact optical methods to measure ocular microtremor.

Professor Davis Coakley who has retired from clinical practice continues to have a major input into the Mercer's Institute. He still chairs the Steering Committee and acts as an advisor to our new MISA centre development team. Professor Kenny and Dr. David Robinson are taking the lead in the Liberties Asset Mapping Project (LAMP) which aims to develop a community health research infrastructure map for the Mercer's Institute for Successful Ageing catchment area. They both visited Chicago during the summer and the aim is to have a very close comparative link with the South Chicago and the MISA catchment areas.

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

On Monday 9th May 2011, Dr. James Reilly, Minister for Health, officially launched the first results from TILDA which are outlined in the publication Fifty Plus in Ireland. First Results from the Irish Longitudinal Study on Ageing are available from the web site www.tilda.ie.

Dr. Aisling O'Mahoney has joined the TILDA project team and Dr Hillary Cronin has taken up her position as a Consultant in Mullingar General Hospital.

The Inaugural Lecture of the Mercer's Institute for Successful Ageing "Ageing and the Life of the Mind" was presented by Professor Tom Mitchell on the 9th of May 2011 in the Dining Hall Trinity College. Professor Mitchell was a former Provost of Trinity College and a subsequent Chairman of the Board of St. James's Hospital.



Professor Tom Mitchell



Left to right: Dr. J. Kennedy, Prof RA Kenny, Prof T Mitchell, Prof D. Coakley, Prof JB Walsh and Prof J Harbison

The lecture was an outstanding and superb discourse on the contribution of the mature mind to the wealth of civilisation from ancient to modern times. It was positive and uplifting and an inspiration to all who were present. The lecture is available to download from the MISA website at www.misa.ie

Funding in these difficult economic times continues to be a major challenge for the Mercer's Institute for Research on Ageing. While some of the projects have committed ring fenced funding such as TILDA, TRIL and TUDA much of the other work in the Mercer's Institute has been very heavily dependent on the funding we receive from the Mercer's Hospital Foundation and this funding has significantly reduced over the past two years.

While the majority of the staff working in MIRA are established physicians in the hospital and in the University the bulk of our ongoing research and most new research projects are heavily dependent on our funding from the Mercer's Hospital Foundation.

We remain extremely grateful to the Mercer's Hospital Foundation for continuing to prioritise the work of the Mercer's Institute for Research on Ageing in these difficult times that we all have faced. We would like to sincerely thank their Board for their invaluable support and continued encouragement not only over the last year but over the last twenty years since the Mercer's Institute was founded. We also would like to express our sincere thanks for the support that we receive from Mr. Ian Carter the Hospital C.E.O, the St. James's Hospital Board, Trinity College, the HSE and the Department of Health.

In addition to our clinical and research teams we would also like to particularly thank Ms Carol Murphy, our administrator whose incredible organisational and interpersonal skills and huge commitment to the Mercer's Institute has been central to the smooth running of MIRA. Our special thanks also goes to Ms Judy Oxley who co-ordinates, page sets and prints our MIRA report each year. She also manages the Mercer's Institute for Successful Ageing web site at www.misa.ie



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



Professor Davis Coakley
Chairman
Steering Committee



Professor Rose Anne Kenny
Director
Mercers Institute for Successful Ageing

Memory Clinic Activity

There were 1041 patient visits to the memory clinic from January 2011 to December 2011. These include 488 assessment visits, 488 feedback visits and 65 visits for direct assessment of function. Approximately 54% of the visits were new referrals to the clinic.

All patients initially underwent a comprehensive two to three hour assessment involving a structured interview and psychometric testing and were subsequently brought back for feedback where test results, diagnosis and management plans were discussed. Over the last number of years the most common diagnosis of patients attending the clinic has been that of Mild Cognitive Impairment (MCI) reflecting patient demand for early assessment and diagnosis. This trend continues this year with 41% of all patients attending the clinic receiving this diagnosis.

Through collaboration with the Radiology Department at St. James's about 80 patients have had PET neuroimaging performed. This has greatly helped in the early diagnosis and differentiation of specific dementia subtypes. PET is a relatively new tool in the diagnosis of cognitive disorders and an invaluable insight and experience has been gained at the clinic regarding its use. The collation, analysis and interpretation of this PET data is currently underway.

Memory Clinic Conference

The Memory clinic in conjunction with the Dementia Services Information Development Centre (DSIDC) organised the first ever national memory clinic conference, which was held in March of last year. This brought together healthcare professionals from memory clinics throughout Ireland and other special interest groups in the area to share and discuss ways on improving and building on current services.

Several of the Memory clinic staff including Dr Thomas Monaghan, Nurse Irene Bruce and Dr Robert Coen delivered presentations on various aspects of the services provided by the St James's Memory Clinic. This meeting proved to be very successful and received a commendation at the Irish Healthcare Awards in November. A memory clinic conference was also held in Dublin in December to further discuss and share ideas on developing and integrating memory clinic services.

MSc Dementia Studies Trinity College

Professor Brian Lawlor, Dr Robert Coen and Irene Bruce Clinical Nurse Specialist in dementia have given lectures during the year to the students undertaking the MSc in Dementia Studies. Several of the students on the MSc course have visited the Memory Clinic and spent some time seeing the theory put into practice. Health professionals from several hospitals have also visited the clinic over the last year to learn about setting up and expanding the services they provide in their institutions.

Autobiographical Memory

Based on Muireann Irish's work (see previous MIRA reports) through which we developed a novel measure of Autobiographical Memory for which she was awarded a Ph.D from TCD we continue to submit papers for publication - see publications.

The Trinity, University of Ulster and Dept of Agriculture (TUDA) Cohort Phenotype / Genotype database.

Dr. Coen in collaboration with Dr. Kevin McCarroll is continuing with normative interpretation of data on the Repeatable Battery for Assessment of Neuropsychological Status (RBANS) in the TUDA Study which is discussed in more detail elsewhere in this report.

The Irish Longitudinal Study on Ageing (TILDA) & The Memory Clinic.

Having assisted with the development and implementation of the cognitive battery used in TILDA, Dr. Coen in collaboration with Dr. Paul Dockree, Psychology Dept, TCD, Psychology post-grads and TILDA staff is continuing normative analyses of the cognitive tests from the TILDA battery. The MoCA findings have been evaluated and presented – see publications. MMSE has been evaluated, and further normative analyses are currently under way.

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

In collaboration with the Principal Investigator Dr. John Nolan and Waterford Institute of Technology Dr. Coen is working on the implementation of Clinical trials with regard to cognitive outcomes following Carotenoid supplementation in three cohorts - young healthy individuals, elderly individuals with Age Related Macular Degeneration AMD (\pm MCI) and elderly individuals with AMD and dementia.

Study of Post stroke fatigue and Post Traumatic Stress Disorders (PTSD)

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 disorders for which ethical approval was obtained. Data collection is ongoing.

Neuropsychological functioning and prosthetic rehabilitation outcomes.

In collaboration with Dr. Fiadhnaith 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.

Single Assessment Tool (SAT) Working Group

Dr. Coen is 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 have been working 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 data collection is ongoing, headed up by Doug Beaton, SAT Project Manager, Informatics Lead, HSE Health Intelligence.

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

MIRA 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 – publications are in progress.

Young Onset Neurodegeneration (YON) study.

Dr. Coen is a co-investigator (consultative, supervisory) on the YON study, Principal Investigator Prof. Orla Hardiman, principal researcher Dr. Thomas Monaghan - see elsewhere in MIRA report.

Centers of Excellence in Neurodegeneration (COEN) International initiative.

Dr. Coen is involved as a co-applicant with Dr. Arun Bodke, TCD (Principal Applicant) and colleagues in the Resilience to cerebral amyloid load (RECAL) study which is currently at the implementation stage.

Anxiety and Cognition

Dr. Eileen Sweeney, Research Fellow in Psychiatry, 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

A review of the Dublin Healthy Ageing Study first wave data for information on anxiety prevalence in Dublin primary care attendees and whether it is comorbid with other medical, mental health or cognitive problems is in preparation.

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. The 'GAI score' has been added to the MIRA memory clinic database to facilitate audit of the rates of generalised anxiety diagnosed before and since introduction of the screening tool. This will have been in use for one year in August 2012 and will be audited at this time to examine the correlates and determinants of anxiety in MCI and AD.

Biological correlates of anxiety in cognitive disorders

A putative pathway for the contribution of anxiety to cognitive impairment is via the brain-mind interface of the hypothalamic-pituitary axis. Several studies in recent years have associated higher cortisol levels in older people with poorer cognitive performance and accelerated decline in Alzheimer's disease. Dr. Sweeney has devised and obtained ethics approval 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. Recruitment for this study will begin in January 2012. The plan is to extend this 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, Dr Sweeney developed '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 is delivered in a group format, to maximise access for patients and cost-effectiveness for the clinic. Specific modifications have been made to allow optimum participation even where the participant has physical or cognitive impairments. Psycho-education for carers is also provided as part of the intervention.

Dr. Sweeney and Ms Irene Bruce (Clinical Nurse Manager of the Memory Clinic) completed the TCD Foundation course in Cognitive Therapy over the year 2010/11 and act as co-therapists in the delivery of the group. So far, two cycles of the group have been completed and recruitment is complete for a third cycle. In this intervention study, the primary outcome

measure is relief of anxiety symptoms but cognitive and quality of life measures are also being investigated.

The Cognitive Studies Clinic at the Memory Clinic.

The HRB funded NeuroCardioVascularInstability study led by Prof Kenny is in its final phase of recruitment with almost 150 patients and 75 controls enrolled from more than 850 people screened over the last 4 years at the Memory Clinic. Dr Orla Collins has published the initial cross-sectional study results from the NCVI project in Neurobiology of Aging as “Parasympathetic autonomic dysfunction is common in mild cognitive impairment” with nurse Sheila Dillon and Profs Brian Lawlor and Rose-Anne Kenny. Dr Collins is currently completing her thesis and will be joining the consultant staff of St Vincent’s University Hospital. Dr Thomas Monaghan who has been research registrar managing the Cognitive Studies Clinic patients since July 2010 will be leaving the NCVI project to take up a consultant neurologist appointment in March 2012. Dr Tomo Hayakawa research registrar, joined the NCVI project in August 2011. Dr Hayakawa is completing the study to ensure that recruited patients continue to have longitudinal follow-up within the study and that data interpretation is finished to complete the NCVI project. This includes completing a lumbar puncture cohort, biomarker analysis and examination of the imaging data derived in the study.

Young Onset Neurodegeneration Study.

The Young Onset Neurodegeneration study is a population based study led by Prof Orla Hardiman in Beaumont Hospital with Dr Colin Doherty and Prof Brian Lawlor in St James’s Hospital as co-Principal Investigators. Dr Thomas Monaghan is the research registrar currently managing the project. This study is being carried out with the involvement of Beaumont Hospital, St James’s Hospital, AMNCH and St Vincent’s University Hospital. Recruitment is continuing for patients with young onset primary neurodegenerative conditions such as Alzheimer’s, Parkinson Disease, Huntington’s Disease and Lewy Body Disease. The current focus of this study is to examine prevalence rates in Dublin city for these conditions in the under 65’s to develop a better understanding of these cohorts and their needs. In time this should lead to being able to develop cohorts of patients with these conditions who may wish to participate in further research studies in neurodegenerative disease.

The Enhancing Care in Alzheimers Disease (ECAD)

This study seeks to explore the economic, psychosocial and physical costs associated with AD and mild cognitive impairment with particular focus upon the frequently neglected informal care-giving support structures which are so essential to the care of patients. Baseline data began in 2009 and was completed in 2010. 115 community-dwelling patient/carer dyads were assessed, stratified according to severity of AD in the care recipient, using standardised questionnaires, physical parameters as markers of physical wellbeing and frailty and venous blood sampling.

Progress to Date: In 2011, funding and ethical approval was obtained for a longitudinal follow-up. Out of 84 remaining eligible participant dyads, data was collected through home visits from 67 participant dyads, 60 of which comprised assessments and interviews with both the original caregiver and patient present.

This data included demographic information, as well as information on cognitive, physical and neuropsychiatric features of AD, caregiver strengths and stressors and patterns of resource utilisation. The outcomes of analyses due to be carried out in early 2012 will include measures of the economic and societal costs of AD and measures of adverse biopsychosocial

outcomes for patients and caregivers such as depression, poor health behaviours, stress related illness including frailty and predictors of early patient institutionalisation.

It is envisaged that the findings of the ECAD study will help facilitate effective planning of potential interventional strategies to achieve improved outcomes for patients and carers alike. It will equally inform decision-making regarding the most effective deployment of existing healthcare resources in the Irish context.

Social and Mental Health Strand 2011

In 2011 we designed and deployed a study investigating psychosocial and executive functioning in insomniac and control older adults, and their relation to subjective and objective measures of sleep quality. Deploying to 32 homes, we found that loneliness may underlie the relationship between executive dysfunction and self-reported poor sleep quality in older insomniacs. We performed analyses of the TRIL cross-sectional cohort data, investigating areas such as circadian functioning and cognition, frailty and social support, loneliness and personality, exercise and social support, and exercise and perceived health. We then commenced analysis of the longitudinal wave of TRIL data, investigating areas such as perceived versus actual social support, depression and frailty, stress and sleep, and perceived versus actual health. We created a 15-item scale measuring psychological distress in 2010; in 2011 we validated this scale among 100 TRIL participants, and found that its psychometric properties are acceptable. The strand were involved in the 'caregiver support tool' project, which, in collaboration with Intel, aimed to develop an ICT solution for monitoring wellbeing and providing informational support to caregivers of older adults with dementia. The strand also delivered the first phase of a project with Pfizer Ireland aimed at assessing opportunities for developing a 'remote assessment tool', continuously monitoring the physical, cognitive and psychosocial wellbeing of community-based older adults with dementia and their caregivers. Finally, the strand completed a review into pathways for information support for older adults.

NILVAD

NILVAD is a new consortium of research partners, clinical sites and advocacy groups in Europe created around the FP7-Health 2011 initiative and co-ordinated by Professor Brian Lawlor of Trinity College Dublin Ireland. NILVAD has just been listed for grant funding by the European Commission FP 7 Research Framework Programme to conduct an investigator initiated multi-centre European treatment trial of NILVADIPINE, a medication already licensed for blood pressure control, in Alzheimer's disease.

Alzheimer's disease is now the most expensive illness worldwide in terms of health and social care costs and the numbers of people who will develop this disease are projected to double by 2050, making this illness a major research priority for European Community. There are few effective symptomatic treatments and as of the moment, no treatment that can delay or prevent Alzheimer's disease. NILVADIPINE is a medication already approved and used in many European countries for the treatment of high blood pressure. Treating high blood pressure with medications like NILVADIPINE have been show to decrease the risk of developing dementia and Alzheimer's disease.

In partnership with Roskamp Research Foundation in Florida, who developed the basic science evidence for the potential effectiveness of NILVADIPINE, Mercer's Institute for Successful Ageing at St. James's Hospital, Dublin, conducted an earlier safety study in Alzheimer's disease patients that formed the basis for the clinical trial. Now, in collaboration with key partners and Alzheimer's disease experts at University of London, Cork, Nimijen,

Goteberg, Ulm, Milan, Budapest and Thessaloniki, and following successful completion of negotiations with the EC, NILVAD will conduct this multi-centre European trial to determine if NILVADIPINE can improve memory and functioning but also slow the rate of progression on Alzheimer's disease. NILVAD plans to start the planning phase of the trial in January 2012, with recruitment beginning in the latter part of 2012, pending conclusion of negotiations with the EC in September 2011.

NILVAD is an exciting development in the field. There have been no new drug treatments developed for Alzheimer's disease since 2003 and there is a clear unmet need for patients and society. NILVAD will create a new research network throughout Europe and show whether a novel approach with increases blood flow to the brain and lowers amyloid levels in the brain can make an impact in Alzheimer's disease. Because NILVADIPINE is already available and licensed, this type of study can be carried out more quickly, to the potential benefit of future generations of people with Alzheimer's disease, their caregivers and society.

Trinity, University of Ulster, Dept of Agriculture (TUDA) Study.

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.

To date, 3000 patients have participated in the TUDA study at St. James's Hospital. This is comprised of two cohorts, 1700 with cognitive impairment and 1300 with osteopaenia/osteoporosis, all of whom have underwent a detailed assessment lasting about 70 minutes. This includes 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.

Recruitment in the bone cohort is ongoing and will finish in the next 5 months, bringing the total study number to 3500 at St James's. 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. Two clinical research nurses (Sinead Mc Niffe and Helen Toohey), two research students from the University of Ulster, and the Watts Clinical Research Fellow Dr. Kevin Mc Carroll have been recruiting patients from St. James's Hospital.

When complete, the total study population in TUDA will be 5500, making it one of the largest studies of its type in Ireland. The TUDA database will be a hugely important resource for research within the Mercer's Institute for several years to come. 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.

The TUDA study will also greatly complement the TILDA study which is looking at a more general community dwelling population cohort and hence allow for interesting comparisons.

A pilot analysis of a subset of about 400 patients from the TUDA study was submitted by

Dr Kevin McCarroll (Watts Research Fellow) as abstracts at the Irish Gerontological Society Annual meeting in September and at the Autumn meeting of the British Geriatric Society in 2011. The analysis found a very significant relationship between lower serum vitamin D levels and the presence of cognitive impairment or depression after adjusting for numerous confounds. The study exploring the link with depression was awarded a poster prize at the IGS meeting.

Dr Kevin McCarroll has also submitted research for peer review exploring on the relationship between serum vitamin D and orthostatic hypotension in a case control study involving subjects at the Falls and Blackout Unit at St James's and in the Dublin Healthy Ageing Study.

His main focus however, will be in analysing the relationship between vitamin D and blood pressure, cognitive impairment, falls and depression in the full TUDA dataset in the coming months, as part of his doctoral thesis which he hopes to submit later in the year.

Analysis of the RBANS (Repeatable Battery for the Assessment of Neuropsychological Status) results in the TUDA study is ongoing and being undertaken by both Dr Kevin McCarroll and Dr Robert Coen. This is looking at the application of different normative cut off values in determining cognitive impairment with the RBANS test. This may help in identifying the most appropriate way of scoring this test in an older Irish population.

Liberty Asset Mapping (LAMP)

Dr. Davis Robinson has joined St. James's Hospital and the Mercer's as a consultant physician and is supporting its activities in the areas of acute care, stroke thrombolysis, rehabilitative care and dementia care. Dr. Robinson is clinical principal investigator (PI) on the Liberties Asset Mapping Project (LAMP). This is a community-based project to map all the businesses and services in the hospital catchment area that may affect the population's health a process known as asset-mapping. Developed in association with Professor Stacey Lindau of the University of Chicago, it is intended that local students will map the streets of the Liberties using smartphone technology. Professor Rose Ann Kenny is asset-mapping PI while Jennifer Feighan acts as project manager. Dr. Gerry Boyle (Dept. of Medical Physics) is technology PI.

Asset-mapping is a capacity-building exercise that concentrates on the positive physical and human assets of a community and to date Dr Robinson and the LAMP members have developed links with the South Inner City Community Development Association, the Digital Hub, Geodirectory and others to identify health and social deficits in the area. Future iterations of this project will involve characterising the older patients of the catchment area in detail with a view to developing preventive, targeted interventions that are clinically and geographically relevant. Dr Jeannette Golden, a psychiatrist specialising in later life, has contributed to the design of an intervention which will be biopsychosocial in nature. The clinical goal of LAMP will be to use data collected to inform interventions which will improve resilience of older people and contribute to successful ageing.

Lastly, LAMP will act as an infrastructure to allow deeper involvement of industry with clinical problems. A rich, granular dataset and ethical access to patients will offer an attractive test-bed for Irish and international companies to gain 'real-world' experience of providing devices and services to older people. The context and aims of LAMP were presented at the Trinity College Ageing Research Strategy town hall meeting, January 2012.

Emergency Department (ED) and the Community

Dr. Robinson has developed a primary care outreach service that is delivered in local general practice, and is engaging with the emergency department (ED) to bring the MISA Clinical

Pillar closer to the 'front door' of the hospital and into the community. Older people account for approximately 9,800 visits to the ED each year (2010-2011). However, just 300 people contribute 18% of this activity (St James's hospital, 2010).

Dr Robinson is collaborating with the ED to identify those older people at risk of re-presentation and functional decline. As part of this preventive remit, MISA provides a sessional commitment to Prof. Fergus O'Kelly, a local general practitioner. Older patients are reviewed in the general practice offices and benefit from rapid access to geriatric expertise, and subsequent referrals to the specialist clinics provided by MISA.

Falls and Blackout Unit

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 MedEL 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, MedEL services and Peripheral Hospitals from all around the country. It provides the largest syncope clinic service in Ireland.

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 (In excess of 100 patients have internal loop recorders in

situ and of these 80 are monitored remotely by means of Carelink technology in addition to clinic downloads and review)

Hallpike and Epley Maneuvers (particle repositioning therapy for BPPV)

Autonomic Function Test

Consultant Led Clinics:

Prof Kenny's clinics take place Monday to Wednesday inclusive. This is a tertiary referral service, accepting referrals for all adult patients. Dr. Cunningham's clinic takes place on Friday. It is a MedEl specialist clinic for those over 65 years with unexplained falls and blackout. On all clinic days except Thursday, inpatient referrals are seen in addition to booked appointments if possible. In the event an inpatient referral has not been reviewed prior to discharge it is prioritized as an outpatient. Emergency department referrals are now by means of 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 2012.

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 utilized is the Ewing Battery.

Nurses supervise attachment of monitors for patients within the clinic and also on the wards. This allows for quick assessment of blood pressure and heart rate on a 24 hour or seven day basis.

The monitors that are 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 80 patients across Ireland have availed of this service in 2011. The service allows for immediate review of heart rate activity thereby reducing the number of hospital visits required for that patient.

Satistics:

Falls and Blackout Clinic: Summary of Attendances

	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

Falls and Blackout Unit: Source of New Referrals in 2011

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

Falls and Blackout Unit: Monitor Clinic

	Number of Patients Attending FABU
Internal Loop Recorder (ILR) in Situ	>100
ILR Monitored Via Carelink	80
Number of Monitor Downloads Reviewed per Month	30-50

Teaching and Audit in Falls & Blackout Unit

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.

Presentations to Emergency staff occur quarterly, as a means of providing training and developing awareness of the service to newly appointed staff. This facilitates appropriate discharge from the emergency department of patients who can be followed up and assessed in FABU.

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 organized a National Training Day – ‘Syncope in the Emergency Department’ which will take place on February 10th 2012 in the Durkan Lecture Theatre in the Trinity Health Sciences Building. The course directors are Professor Rose Anne Kenny and Dr Conal Cunningham and a Keynote Speech will be given by Professor Richard Sutton, Professor of Cardiology, and St. Mary’s Hospital London.

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

Ongoing research continues within the clinics.

The FABU also works closely with the TRIL clinic, both with 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 2011, Dr Clodagh O’Dwyer (SpR MedEL) continued her research towards a PhD 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 analyzing 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 MedEL) is currently undertaking a Ph.D within the MedEL 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 utilizing finometry and head up tilting facilities.

Dr Aoife Laffen (Department of Neurology) is also undertaking research, a component of which also involves utilization of the specialized cardiovascular technology in FABU. In the coming year it is hoped there will be collaborative research between the emergency department and FABU.

Bone Health & Osteoporosis Unit

The Bone Health and Osteoporosis Unit continues to be extremely active in both the diagnosis and clinical management of patients with osteoporosis. Prof JB Walsh and Dr Miriam C Casey are the Principal Consultants in the Unit and are involved in the co-ordination of the research activities and the running of the service.

Summary of Unit:

- Clinical Nurse Specialist (CNS) Led Pre-assessment Clinics
- Fracture Liaison Service
- Specialised Colles and Hip Fracture Clinics
- Parathyroid Hormone Treatment Patients
- Intravenous Zoledronic Acid Clinic
- Denosumab injections
- Inpatient Falls and Fracture Prevention Service
- DXA service
- Research Projects

Clinical Nurse Specialist Led Pre-assessment Clinics

CNS led pre-assessment clinics (twice-weekly) continue to be the first point of contact for patients who are referred for assessment of their bone health and risk for fracture. Patients attend from 3 sources:-

- External referrals from their general practitioner or other hospitals,
- General Medicine Clinics within St James Hospital including the MedEL Department, and Fracture Liaison Service.

A comprehensive assessment is performed on all patients and includes risk factors for osteoporosis, risk factors for falls and advice on diet, lifestyle modifications and education on treatment. On a patient's first attendance at this clinic an extensive screen is undertaken.

This includes a DXA scan, a calcaneal bone ultrasound, a full biochemical and hematological workup including an estimation of serum bone markers.

In 2011, a total of 1222 patients were seen in these clinics, which is an increase of 58% from 2010. The number of new patients attending for initial assessment has doubled since 2010.

This reflects a greater awareness of osteoporosis and the established service available in St James', leading to a greater demand. This need was met through the allocation of extra appointments and additional Vertebral Fracture Clinics. The breakdown of patients seen in the various Osteoporosis assessment clinics is as follows:

Clinic Type	2010	2011
<i>Total pre-assessment clinic attendances:</i>	710	1222
New	278	553
Review	279	408
<i>Colles/upper limb Fracture</i>	59	75
<i>Hip Fracture</i>	94	89
IV Zoledronic Acid Clinic	160	261
<i>Bone Health Appraisal (finished Dec 2010)</i>	103	----

Table 1. Breakdown of Patients attending the Various Osteoporosis Clinics within the Bone Health and Osteoporosis Unit.

Fracture Liaison Service.

The Fracture Liaison service continues to incorporate orthopaedic ward rounds. In 2011 a total of 253 patients who sustained a hip fracture were reviewed by a Registrar and CNS during their hospital stay. Alternatively a patient who sustains a fracture may be discharged from the Emergency Department and therefore will be followed up in the CNS led clinics. The service has grown to incorporate all patients with fragility fractures (hip, wrist/colles, vertebral, pubic rami, humeral and tibia/fibula fractures) over the age of 50 years attending the orthopaedic service within the hospital. These patients are offered a detailed screening for osteoporosis, including DXA scan, biochemical blood markers and follow-up in the bone health clinics.

Hip Fractures

Hip fractures are the most common fracture seen on the orthogeriatric ward rounds. 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 medical staff. Hip fractures account for nearly 10% of all non vertebral fractures and for a much higher proportion of fractures in the elderly. The number of fractures referred to the service continued to rise due to awareness of the issue of osteoporosis as well as the inclement weather in the winter of 2010-2011.

Year	2005	2006	2007	2008	2009	2010	2011
Hip Fractures	164	196	167	172	180	197	253

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

Colles and Peripheral Fracture Follow-up Clinic

All older patients presenting with a peripheral fracture, particularly those who present with colles fractures are offered a follow-up appointment at a Specialised Osteoporosis Clinic, which occurs every 2nd Thursday morning. This nurse-led clinic reviews risk factors for falls and osteoporosis. Patients are commenced on treatment as indicated by their assessments.

Parathyroid Hormone Treatment Patients

Over 450 patients have been commenced on or completed parathyroid hormone therapy to date. These patients have established osteoporosis, which may have been refractory to other forms of treatment or have evidence of fragility fractures. For patients who have sustained a vertebral fracture, several international studies have shown a substantial improvement in bone quality but also an improvement in back pain after treatment with both forms of PTH therapies available.

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 or patients who are deemed not suitable for PTH therapy.

There has been an increase in the number of patients receiving IV zoledronic acid in the Robert Mayne Day Hospital with 261 attending in 2011 for assessment and treatment. It may be given 6 monthly or yearly. Patients are assessed prior to administration of the drug and for post infusion complications.

Since July 2009, a new protocol was successfully implemented to monitor Serum Calcium and Vitamin D levels within one week following infusion to observe any hypocalcaemia. This has led to a reduction in the incidence of complications from the infusion and an improvement in patients symptoms post treatment.

Denosumab Injections

In late 2010, denosumab became available to treat osteoporosis. It is a novel and useful addition to the treatments for severe osteoporosis particularly in those with chronic kidney disease or gastrointestinal conditions. To date 82 patients have received this treatment. It is administered as a subcutaneous injection by the CNS's. Reported side effects have been rare and largely mild in nature making it a safe option in our older population. Serum calcium and bone markers are measured 2 weeks post-dose.

Inpatient Falls and Fracture Prevention Service

Inpatients at high risk of falls are targeted for fall and injury prevention once they are admitted under the care of the MedEL department. Each patient is screened for their falls risk on admission using a falls risk assessment tool (STRATIFY).

Summary of Inpatient Falls and Fracture Prevention in 2011

Total of 322 post-fall assessments carried out, a reduction of 13% from 2010 : 116 new patients assessed, 206 reviews on recurrent fallers.

12 (3.7%) of Falls were in Connolly Norman Ward (PsychEL).

Injurious falls (MedEL & Connolly Norman) were 77 (23.9%)

An annual audit was also carried out on falls risk assessment and hip protector compliance

Fall Prevention Strategies in use throughout MedEL

Fall alert sign over bed (if patient has consented to this)

Fall (orange) wristband wearing by patients at risk of falls (if patient has consented)

Nurse fallers adjacent to nurses station

Chair/bed alarms for recurrent confused patients.

Fall & Injury Prevention in-service at ward level run by MedEL CNS.

Notification by nursing/medical staff to MedEL CNS regarding patients who have been admitted with a fall or is at high risk for fall so that pre-fall assessment can be carried out.

Use of 'specials' for recurrent fallers prone to injury if indicated.

Use of STRATIFY (now incorporated into nursing documentation)

Use of fall diary on each faller.

The MedEL CNS team is actively involved with the Nursing Practice Development Unit (NPDU) working to further develop and support the implementation of a pan-hospital Falls Management Programme. It is anticipated that education and training will begin on wards outside the MedEL directorate with increased falls rates in early 2012.

DXA (Clinical Densitometry Service) Service

The DXA service has increased further the number of scans per year. 2507 patients were scanned in 2011 which is an increase of 5% from the previous year. The service is available both to community GPs and hospital consultants. Patients identified as having significant osteoporosis are also offered appointments for the pre-assessment clinics.

Patients are prioritised based on their risk factors for osteoporosis with those having the highest risk being assessed as early as possible. The diagram below demonstrates the most significant risk factors for osteoporosis in patients attending the service

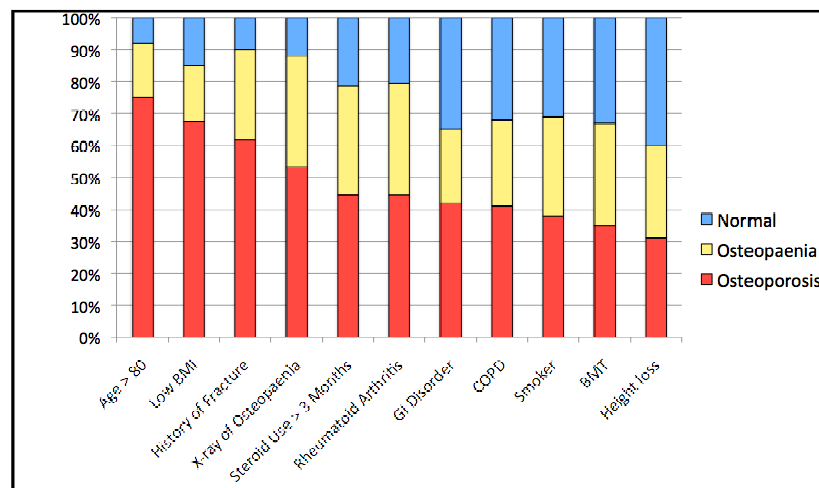


Figure 1. This diagram demonstrates the breakdown of 3,691 patients referred for DXA by Reason for Referral. Age was the most predictive factor for osteoporosis, with 75% of 80 yr old patients having osteoporosis on DXA

St. James's Hospital Clinical Biochemistry Department

Our close links with senior biochemist Dr. Martin Healy and consultant chemical pathologist Dr. Vivion Crowley and have been indispensable in enabling us to provide the comprehensive biochemical studies and bone markers on patients attending the various clinics within the Bone Health and Osteoporosis Unit. These bone markers provide us with critical information on the rate of new bone formation and the rate of bone turnover and bone loss in individual patients. We also gain essential information on patients' individual Vitamin D status and bone turnover marker levels. With the help of this information we are able to make critical choices on the correct therapy for each individual patient where in the absence of this knowledge we would be making these clinical decisions purely on the basis of clinical information and bone imaging.

Dr. Martin Healy is a leading international expert in the area of bone biochemistry and Vitamin D. Dr Healy's insight into newer markers and diagnostic techniques have added greatly to the treatment decisions in the osteoporosis clinic, particularly in the area of vitamin D deficiency. Various projects have been carried out with the department of biochemistry looking at TRAP and 25(OH)D levels. The department of Biochemistry acquired a new Mass Spectrometer, which will allow for a more rapid measurement of Vitamin D and for a greater range of analysis of Vitamin D metabolites and active forms of the Vitamin D hormone.

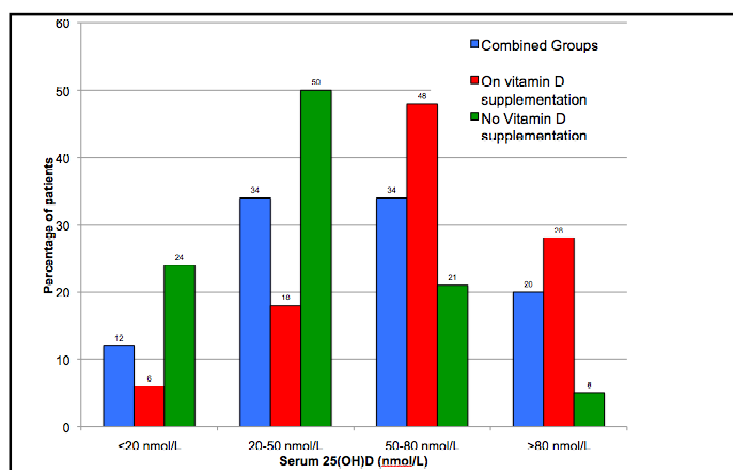


Figure 2. The above shows recent data on the prevalence of vitamin D deficiency in 633 patients attending the osteoporosis clinic in St James's Hospital.

We can clearly see that most patients attending our Osteoporosis Clinics are vitamin D deficient, requiring supplementation and monitoring of their serum vitamin D levels. The above work would not be possible without Dr M Healy's and Dr Crowley's input.

Research Activities

Dr. Joe Browne has just been awarded his MD Thesis from Trinity College Dublin for his work on Hip Fracture and Vitamin D Deficiency in patients with osteoporosis.

PACE Study:

Clinical Investigators: Dr. Miriam Casey, Prof. JBernard 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 2012.

Intervention of the Clinical Nurse Specialist in Hip Fracture Patients
 Clinical Investigator: Ms Niamh Maher, Clinical Nurse Specialist

Post Hip Fracture Study

Hip fracture patients are at increased risk of disability after hip fracture and may be at risk of further falls and fractures. Niamh Maher is completing her PhD and her studies are focusing on optimising the management of hip fracture patients.

"Post Hip Fracture in Older Adults: Interventions and Strategies for Improving Outcomes. The role and Function of the Clinical Nurse Specialist within an Elderly Falls Unit". This 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. A total of 226 post hip fracture repair patients have been recruited (112 in control group and 114 in study group). Data analysis is ongoing. This study is funded by the HRB.

MOVE Study:

Principal Investigators:	Prof. JB Walsh/Dr. Miriam Casey
Clinical Investigators:	Mr. Niall Hogan Mr. Kieran O'Shea Mr. Johnny McKenna Mr. Tom McCarthy Dr. Rosaleen Lannon
Clinical Nurse Specialist:	Ms. Kara Fitzgerald

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 35 mg 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 analog pain scale and SF-36 Health Status Questionnaire to assess differences in outcomes between the two groups.

Recruitment is due to start in 2012 and the duration of the study is 2 years.

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)

This is an ongoing study in St James's Hospital. It 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 is a 2 year randomised controlled study which commenced in 2010 and aims to recruit 180 patients.

Stroke

2011 has been a successful year for the stroke department. The volume of research conducted in the department has substantially increased following the introduction of a new clinical stroke fellow and also a part time clinical psychologist. Dr. Karl Boyle, clinical stroke fellow has provided much needed support for Professor Harbison in the clinical setting while also advancing our knowledge regarding the characteristics of atrial fibrillation in the Dublin population through his work on the TILDA Study. Atrial

Fibrillation among the Irish Population has also been investigated by TILDA scientist John Frewen, in conjunction with Professor Harbison. A clinical psychologist, Claire Crowe is currently investigating the possibility that post-stroke fatigue may be more likely to occur in those who suffer post-traumatic stress as a result of their stroke. This continues Professor Harrison's work on post stroke fatigue, which was published in the Journal of Stroke and Cerebrovascular diseases last year.

Dr. Dan Ryan, HRB stroke research fellow continues to investigate the role that low blood pressure episodes may play in the development of stroke. This has been made possible with the aid of the CAMI research scanner and the comprehensive investigative resources of the Falls and Blackouts Unit.

Suzanne Walsh, stroke nurse specialist completed a nurses prescribing diploma this year, the first nurse in the Medel Department to do so. Consequently, Suzanne has a greater capacity to effectively manage patient's blood pressure within the secondary prevention clinic. Suzanne has also co-ordinated and ran a national stroke education day for nurses this year and hopes to repeat this next year.

2012 looks to be an equally exciting year for the stroke department. This year a second specialist stroke nurse will join us. Olivia Mahon will optimise the care of stroke inpatients, through education of staff and patients and management of medical co-morbidities. The European Hypothermia Trial, Eurohype, will commence in September this year, of which St. James Stroke department will play an important role. This will investigate whether the induction of hypothermia in the acute stroke period may slow the death of brain tissue.

Medical Physics and Bioengineering

Technology related research at MIRA

MIRA has a long running collaboration with the Dept. of Medical Physics & Bioengineering at St. James's Hospital in technology related research and development projects. The engineering team collaborating with MIRA consists of Dr. Gerard Boyle, Dr. Ciarán Finucane, Tim Foran, Fran Hegarty, Emer Kenny and Dr. Chris Soraghan. Research output levels in 2011 were good, with one Ph.D. awarded and two more in train. The group's capabilities in the mobile assistive technology area advanced significantly. The group helped progress MISA's longer term strategy in the technology space through winning a City of Science public engagement bid for 2012 and initiating a Technology Test bed at St. James's.

Gait Dynamics in Fallers

Tim Foran continued his Ph.D investigation into gait and balance dynamics and their relationship to Falls Risk. The recently published AGS / BGS Clinical Practice Guidelines (2010) on Prevention of Falls in Older Persons recommend an evaluation of gait and balance as a key component of the clinical algorithm for decision making and clinical management of older persons. The Ph.D. investigation aims to derive novel biomarkers of gait impairment in older people that indicate increased Falls Risk. Long walk (100 metre) assessments were carried out on the TRIL Cohort on Fallers and Non-Fallers using novel body worn inertial sensors. Data from long walk assessments enable true measures of stride to stride variability to be calculated, and the stride to stride structure of gait fluctuations to be evaluated.

Results were presented at the 2nd International Conference on Ambulatory Monitoring of Physical Activity and Movement, Glasgow, May 2011 and at the European Medical Physics Conference, Dublin, September 2011.

Measurement and analysis of Ocular Microtremor

Emer Kenny is continuing her SFI funded research into a non-contact optical method to measure Ocular Microtremor (OMT) under the supervision of Prof. Davis Coakley and Dr. Gerard Boyle (MPBE). The research to date was presented at the European Medical Physics and Engineering Conference (EMPEC) in September. In-vivo testing of the method has begun and a number of advances have been made. In parallel clinical work underway on OMT, Dr. Niamh Collins has submitted her thesis "Ocular Microtremor as a Clinical and Scientific Tool in Neurologic Disease, Validation and Application of a Generalised Discovery Protocol" for examination.

Communication Aid for Stroke

The importance of mobile technologies in supporting older age is recognised by the group. Dr. Christopher Soraghan undertook specialised training in iPad applications development and an iPad development platform has been acquired. The group is now designing an iPad communication aid for stroke patients in collaboration with the Speech and Language Department (SLT) at St. James's Hospital.

Falls Detection & Prevention

Dr. Christopher Soraghan along with the Occupational Therapy Department (OT) has submitted a proposal to the SJH small grants competition for falls detection and prevention equipment for "Home from Home" in Hospital 4.

Wireless Nurse Call Interface Design

Dr. Christopher Soraghan is designing a novel interface for a wireless nurse call button to integrate with the current Intercall system to allow for ambulatory freedom in the Day Room in Hospital 4. The interface used is proposed as having a reminiscence effect for the user.

NCVI Study Research and Support

Dr. Christopher Soraghan and Tim Foran are working with Dr. Tomoaki Hayakawa (Clinical Research Registrar) on developing an algorithm for extracting physiological variables from the Active Stand Blood Pressure data from the NCVI longitudinal study at MISA.

Bio-engineering Syncope & Falls

Ciarán Finucane, co-supervised by Dr. Gerard Boyle and Prof. Rose Anne Kenny received his Ph.D. from Trinity College Dublin in January. During this project Ciarán developed a computational model of the cardiovascular system, which aids our understanding of the aetiology of Carotid Sinus Syndrome and will help optimise its diagnosis and therapy.

In this work, Ciarán brought engineering principles to bear on the problem of Carotid Sinus Syndrome (CSS), a major cause of falling in older people. This project took a novel but comprehensive and coherent approach to the study of CSS. By designing a computer based mathematical model of the cardiovascular system, Ciarán created a completely new tool to study the underlying physiological causes and signs of CSS and to help develop improved tools for CSS diagnosis. Several exciting findings and advances have been made, some of which have already been submitted for publication. This work was presented at a number of international conferences including CARDI 2011, EMPEC 2011 and Venice Arrhythmias 2011.

A major objective of the work was been to simplify and improve the clinical tests used to diagnose CSS. Currently, CSS is diagnosed through Cardiac Sinus Massage (CSM) – the observation of heart rate and blood pressure responses to neck massage. Using signal processing techniques, the group has demonstrated that the analysis of ECG and blood pressure traces may in the future form an alternative, non invasive approach to the diagnosis of CSS, with the potential to replace or augment the CSM technique. In addition, Ciarán has designed several technical improvements to help standardise and improve the accuracy of CSM.

Support for TILDA Research in Syncope & Falls

Dr. Ciarán Finucane is currently continuing his research in Syncope and Neurocardiovascular Instability in the elderly as part of the TILDA project. Following on from a novel cluster analysis technique developed by Ciarán in 2008, he is now working in collaboration with Dr. Mimi Fan to develop optimal analysis techniques, mathematical models and software for the detection of poor cardiovascular control in the elderly. This will be the first population based study of its kind to examine the patterns of blood pressure control following standing and should lead to better understanding of Orthostatic Hypotension and its role in Frailty and Cognitive impairment at a population level. In an ongoing collaboration with Dr. Orla Collins on this theme, work was published this year in *Neurobiology of Ageing* and another paper was submitted for publication in 2012.

Mr John Frewen, co-supervised by Dr. Ciarán Finucane, Dr. Joe Harbison and Prof. Rose Anne Kenny completed one of the first Intercalated Masters in Medicine at TCD specialising in Bioengineering. As part of this work the Prevalence, Diagnosis and Treatment Rates of AF were determined in Ireland for the first time. Results suggest that AF is significantly under-diagnosed and inappropriately treated in Ireland. This work also led to the design and development of a novel user friendly community based AF detection tool which it is hoped will increase diagnosis rates of AF in the community. The findings from this work have been presented at CARDI, and won an award at this year's IGS.

Dr. Christopher Soraghan has been working closely with Dr. Ciarán Finucane and Dr. Mimi Fan (Mater Hospital) on developing an algorithm for automating the extraction of physiological features from beat-to-beat blood pressure recordings from the Active Stand TILDA (Wave 1) dataset.

Support for TRIL activity

MPBE continues to take an active role in the Technology Research for Independent Living program, providing scientific support for the Research Clinic based in Hospital 4. A novel sensor-based Balance Mat (developed by TRIL Engineers) was introduced into the Clinic, where the influence of multisensory integration on Balance could be studied in a systematic way. A particular focus of the study is to compare the efficacy of Fallers versus Non-Fallers in the completion of a multisensory / balance task.

City of Science 2012

Dublin has been designated European City of Science 2012. A submission driven by MPBE and MIRA to the Dublin City of Science organisers for funding for a public engagement event on "Technology for Older People" was successful. The event will be a significant opportunity to raise public consciousness on the potential and pitfalls of technology in supporting successful ageing.

Technology Test Bed

The implementation of a Technology Test bed where technologies for older people could be assessed and validated in a realistic manner is an objective of the MISA development. This objective was advanced in 2011 through the creation of a Technology Test bed development steering group at SJH hospital level. The group is chaired by Prof. Rose Anne Kenny with technical and developmental direction provided by Dr. Gerard Boyle at MPBE.



Technology Research for Independent Living (TRIL)

Background

TRIL is an international research centre set up to define and profile the ageing process in order to develop technologies to allow more successful ageing. A high proportion of participants reviewed have required referrals to a broad range of clinical specialties for further clinical follow-up. Thus highlighting the potential benefits, both to the individual and to the health services, of early intervention clinics using the TRIL model.

TRIL Highlights of 2011

TRIL 1.5

April 2011 saw the completion of the first wave of longitudinal follow-up of 450 participants from the original TRIL cohort. This rich longitudinal data set is currently being analysed by our group of researchers – looking in particular at how the comparison with baseline characteristics may help find new targets for intervention aimed at helping the older person maintain independence. We hope to identify novel biomarkers for accelerated ageing, as well as illuminate traits of resilience. Interesting results are already emerging in relation to changes in gait, blood pressure, frailty and cognition. Early analysis shows that rates participant attrition between waves compare favourably to international standards in such studies.

TRIL 2.0

A new clinic protocol was introduced in July 2011 and a second wave of longitudinal follow-up saw over 120 participants originally assessed in 2007-2009 return for a third time to the TRIL clinic. Based on insights from our previous research, the emphasis was on falls, frailty, perceptual function and the validation of a new mental health questionnaire designed specifically for older people. Over the six months to December 2011 participants underwent a further evaluation of their gait, balance, cognition, perceptual function and mental health, validating TRIL developed technologies against standard clinical techniques. Again, the longitudinal element will allow the researchers to detail just how this cohort is ageing in each of these vital parameters.

In 2011 TRIL has continued its long track record of achieving peer reviewed publications and high level conference presentations, disseminating its novel research findings both locally and on the international stage. There have been key advances in falls prevention, perceptual function and social and mental health research.

Some of our findings have managed to spark debate not only in the academic sphere but have also struck a note with the press and with those for whom this research is most relevant: the older community. Take, for example, the prize winning research lead by post-doctoral researcher Dr. Aisling O'Halloran – detailing how a positive outlook on one's life can reduce falls risk in older adults. This initially counterintuitive association again demonstrates how the collaborative, cross disciplinary nature of TRIL can lead to discoveries which might otherwise go untapped if obeying the blinkered boundaries of traditional academia. Thus, in TRIL, by profiling not only the bare boned vital statistics but fleshing out our knowledge with who that older person is – where they live, how they think, and how they interact with their environment - TRIL continues to help to facilitate the development of new technology aimed at helping to make living independently for longer, for those who want it, a real possibility.

Data quality initiatives

All data collected in the TRIL clinic to date has undergone rigorous checking and audit procedures prior to the initial longitudinal data analysis. This included a formal quality data cleansing process. virtual centre of excellence which delivers a range of focused research projects by combining the skills and expertise of multidisciplinary teams of scientists from the third level sector, clinical specialists and industrial researchers. Founded in 2007, and based in the top floor of Hospital 4 in MIRA, it has succeeded in raising the agenda for ageing research both nationally and internationally. By advancing research in the ageing domain, the TRIL centre seeks to enable adults to live independently, irrespective of age.

Visits to the TRIL clinic

The TRIL Clinic has hosted multiple visits from external bodies throughout 2011. These have included academic and clinical research groups, as well as several multinational companies with whom we are currently are working with respect to future collaborative research programmes. The pioneering nature of TRIL is such that some have visited with the aim of perhaps recreating a TRIL-like entity in their own institutions.

Period of transition and change

In 2011 despite its many successes TRIL has been faced with the same challenges facing the wider economy. Sadly, this has meant the loss of some valued members of our team. Many of whom have, however, gone on to further research and new posts bolstered by their previous successes in TRIL.

Plans for 2012 and beyond

A further research clinic is planned for 2012 this time with the aim to recruit an entirely new cohort of 140 participants aged 65 and over. A further emphasis on frailty and falls prevention is envisaged – with the use of bespoke TRIL developed technology. We aim to discriminate between those older people who fall and those who don't using new specifically designed technology. We will also continue to embrace the bio-psycho-social perspective that has become the hallmark of the comprehensive approach to ageing that TRIL has helped to pioneer.

Further information on TRIL can be obtained from <http://www.trilcenter.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 per cent 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. 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 2011.

Project description:

A nationally representative sample of at least 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 2011

2011 was a busy year for TILDA with completion of Wave 1 of the study.

Fieldwork:

On 21st February 2011, fieldwork was completed with a total of 8,504 CAPI interviews obtained. There were 7,193 responses to the self-completion questionnaire.

Health Assessments:

The health assessments for Wave 1 of TILDA were completed by the end of July 2011, with a total of 5,277 centre assessments and 876 home assessments.

Funding and Grants:

The three main funders of TILDA are the Department of Health and Children, Irish Life and Permanent Plc, and The Atlantic Philanthropies. TILDA was recently awarded a grant to study depression and anxiety in Ireland, the impact of the recession in Ireland on physical and mental health and to develop early biomarkers of frailty and the ageing process.

Funding included the Health Research Board's (HRB) Interdisciplinary Capacity Enhancement (ICE)

Awards scheme, and awards from the National Institute of Health and National Bureau of Economic Research, USA.

New Staff:

New staff hires for 2011 included one finance administration officer, three health postdoctoral researchers, one neuro-cognitive postdoctoral researcher, one bioengineer, and two biostatistician epidemiologists.

Publications:

On Monday 9th May 2011, Dr. James Reilly, Minister for Health, officially launched the first results from TILDA which are outlined in the publication Fifty Plus in Ireland. First Results from the Irish Longitudinal Study on Ageing are available from the web site www.tilda.ie.

Conferences:

TILDA took part in the annual CARDI conference in Croke Park in November 2011.

Plans for 2012:

Lodge the cleaned data set in the Irish Social Science Data Archive.

Commencement of Wave 2 CAPI interviews, due to start February 2012.

Generate interest in collaborative research analysis and work.

Continue to publicise the study, both nationally and internationally.

PUBLICATIONS

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McHugh JE, Lawlor BA, *Psychosocial correlates of poor self-rated sleep in a sample of community-dwelling older Irish adults*. Irish Sleep Society AGM 19.02.11

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McHugh J. Presentation. *Opportunities to support caregivers of persons with dementia: Implications for ICT*. Seminar in UCD CASL for Alzheimer's Tea Day, 5th May 2011

McHugh JE, Shum T. *Caregiver burden: Opportunities for ICT*. Intel European Research & Innovation conference in 12-14 October

Ní Mhaoláin AM. *The Impact of Frailty on Cognitive Performance in Independent Community Dwelling Older Adults*. 7th Congress of the EUGMS 2011, Malaga, Spain, 28-30 Sept 2011, <http://www.eugms-segg2011.org/>

Ní Mhaoláin AM, Fan CW, Romero-Ortuno R, Cogan L, Cunningham C, Kenny RA, Lawlor BA. *Depression a Modifiable Factor in Fearful Older Fallers Transitioning to Frailty?*. 7th Congress of the EUGMS 2011, Malaga, Spain, 28-30 Sept 2011, <http://www.eugms-segg2011.org/>, CARDI Ageing Globally-Ageing Locally, Croke Park, 2-3 Nov 2011, <http://www.cardi.ie/conference2011>.

Ní Scanaill C, Greene B, Doheny E, O'Donovan K, Dishongh T, O'Donovan A, Tim Foran, T, Cunningham C, Kenny, RA. *Clinical Gait Assessment of Older Adults using Open Platform Tools*. IEEE Engineering in Medicine and Biology Conference (EMBC), <http://embc2011.embs.org/> 30 Aug-3 Sept 2011, Boston.

O'Halloran, A, Treacy K, Walsh C, Cunningham C, Fan CW and Kenny RA. *Always look on the bright side: The impact of positive affect on falls and successful ageing*. CARDI Ageing Globally-Ageing Locally, Croke Park, 2-3 Nov 2011 <http://www.cardi.ie/conference2011>.

O'Halloran, A, Pénard N, Treacy K, Galli A, Clodagh Cunningham, Fan C W, Robertson I, Kenny RA. High Commendation; poster presentation; *We Are Less Likely To Fall If We Stay Positive And Pay Attention!* Irish Gerontology Society (IGS) 59th Annual Conference 2011, Dublin.

Schnittger, R., Lawlor, B. *Exploring Sleep and Loneliness in Older Adults*. 8th Annual Psychology, Health and Medicine Conference, 4th April 2011, NUIG

Awards

Dr. Ciarán Finucane and Mr John Frewen, Irish Gerontological Research Award, 2nd Prize, September 2011.

Presentations

FETAC course SJH

Pulmonary rehab SJH

Eli-lilly training on Patient Journey Workshop

Clinical Skills Fair SJH

HSE Care of older person conference May 2011

MedEL education sessions

Scientific Meetings Attended

ECCEO Valencia Spain March 2011

Irish Gerontological Society Dublin Sept 2011

ECTS Annual Congress Athens Greece. May 2011

Irish Osteoporosis Society Dublin Oct 2011

American Society for Bone and Mineral Research San Diego, October 2011.

Partnerships

St. James's Hospital

Medicine for the Elderly
Psychiatry for the Elderly
Clinical Biochemistry
Clinical Medicine
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