



*Mercer's Institute
for
Research on Ageing*



*Annual Report
2008*

Index

	<i>Section Pages</i>
<i>MIRA Personnel</i>	2 - 4
<i>Director's Report & Executive Summary</i>	5 - 13
<i>The Memory Clinic</i>	14 - 19
<i>Falls, Blackout, Bone Protection and Osteoporosis Services</i>	19 - 28
<i>Stroke, Research and Clinical Services</i>	28
<i>Cognitive Studies Clinic</i>	29
<i>Roskamp Study</i>	29
<i>Translational Research in Neurovascular Instability- HRB Project</i>	29 - 30
<i>Translational Research in Alzheimer's disease – GSK Project</i>	30 - 31
<i>Medical Physics and Bio- Engineering</i>	31 - 33
<i>TRIL – Technology Research for Independent Living</i>	33 - 35
<i>TILDA – The Irish LongituDinal Study on Ageing</i>	35 - 39
<i>TUDA - The Trinity, University of Ulster and Deartment of Agriculture Study</i>	39
<i>Awards 2008</i>	40
<i>Partnership</i>	41
<i>Publications & Presentations</i>	42 - 51

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
Dr. Joseph Harbison
Dr. Elaine Green
Ms Carol Murphy (Administrator)

Watt's Clinical Research Fellow

Dr. David Robinson

Memory Clinic Research Fellows

Dr. Conor O'Lunaigh
Dr. Aine Ní Mhaolain

Lecturer

Dr. Clodagh O'Dwyer

Falls and Osteoporosis Unit

Dr. Joseph Brown

Clinical Neuropsychologists

Dr. Robert Coen
Dr. Marie McCarthy

Research Psychologist

Ms. Muireann Irish

Assistant Psychologist

Ms. Erin Tehee

Clinical Nurse Manager

Ms. Irene Bruce

Senior Social Worker

Mr. Matthew Gibb

Biostatistician

Dr. Cathal D. Walsh

IT Consultant and Technology Adviser

Mr. Vincent Quinn

Falls and Osteoporosis Clinical Nurse Specialists

Ms. Niamh Maher
Ms. Nessa Fallon
Ms. Georgina Steen
Ms. Kara Fitzgerald
Ms. Dympna Hade
Ms. Lisa Byrne/ Ms. Michelle Burke
Ms. Ciara Rice

Senior Radiographer

Ms. Sophie Toth

Medical Physics and Bio-Engineering

Dr. Niamh Collins
Dr. Gerard Boyle
Mr. M. Al-Kalbani
Mr. C. Finucane

Technology Research for Independent Living (TRIL)

Project Team:

Dr. Mimi Fan, Clinical Director
Ms. Patricia Malone, Clinic Programme Manager
Ms. Roisin Brophy, TRIL administrator
Dr. Roman Romero, Medical Research Fellow
Dr. Lisa Cogan, Medical Research Fellow
Dr. Susan Squires – Senior Researcher
Mr. Tim Foran, Senior Medical Physicist
Ms. Claire Somerville, Senior Social Scientist
Ms. Sheila Callinan, Assistant Psychologist
Ms. Deirdre Finnegan, Assistant Psychologist
Ms. Maura O'Sullivan, Senior Physiotherapist
Ms. Clodagh Cunningham, Clinical Nurse Manager II
Ms. Roisin Brophy, TRIL administrator
Ms.. Vanessa Buckley - Research Assistant – Social Connection
Ms. Blaithin O Dea- Research Assistant – Social Connection
Ciaran Wynne - Research Assistant – Falls Prevention

Cognitive Function Study

Mr. Liam Quaide, Research Assistant

The Irish Longitudinal Study of Ageing (TILDA)

Project Team: (mainly based in TCD)

Prof. Brendan Whelan, Research Director
Ms. Melina Ziegel, Programme Manager
Dr. Hilary Cronin, Research Fellow
Dr. Amilcar Moreira, Research Fellow
Dr. Yumiko Kamiya, Research Fellow
Ms. Claire O'Regan, Clinical Research Nurse
Ms. Jacinta O'Grady, Executive Officer
Ms. Pauline Walsh, Executive Officer

Roskamp Project Team:

Dr. Sean Kennelly, Research Fellow
Ms. Linda Warren, Administrator
Ms. Lisa Crosby, Clinical Nurse Specialist
Ms. Meredith Hodder, Clinical Nurse Specialist

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:

Dr. Conal Cunningham, Principle Investigator
Ms. Helen Toohey, Research nurse
Sinead McNiffe, Research Nurse

Secretaries

Ms. Deirdre Cummins
Ms. Martha Gavin
Ms. Rachael Farley
Ms. Heather Bailey
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. S. Ni Bhrian
Dr. H. O'Connell
Dr. D. O'Mahony
Dr. G. Swanwick
Dr. D. Hennelly
Dr. T. Coughlan

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

Medical Social Worker

Ms. M. Headon

PhD Student:

Ms. M. O'Reilly

Directors Report and Executive Summary

2008 marked the 20th Anniversary of the founding of the Mercer's Institute for Research on Ageing. When the activities of the Mercer's Hospital was transferred to the St. James's Hospital campus in the early 80's Prof Davis Coakley and Prof Jim Malone submitted a proposal for the establishment of an Institute for Research on Ageing to the Board of Mercer's Hospital Foundation.

The proposed Institute for Research on Ageing received the support of its Chairman, Professor Bill Watts and the Board of the Mercer's Hospital Foundation. To this day the Mercer's Hospital Foundation remains the main source of flexible funding for the Mercer's Institute.

The funding from the Mercer's Hospital Foundation continues to enable new programmes in the different areas of ageing to be established. Programmes once established have been further developed by research grants from the Health Research Board, Science Foundation Ireland and the Pharmaceutical Industry.

Below is a brief synopsis of the work of the Institute in the different clinical and research areas for 2008. There is a close working relationship between all research units. We also work closely with clinical and research colleagues throughout the hospital and in Trinity College Dublin and other outside institutions.

Centre of Excellence for Successful Ageing

We are most fortunate to have received the support of Atlantic Philanthropies for the planning of the New Centre of Excellence for Successful Ageing. This has enabled the advancement of plans for the new Centre which will incorporate the new Mercer's Institute. The support from Atlantic Philanthropies facilitated the employment of Professor Rose Anne Kenny and Dr. Joseph Harbison who have taken lead roles in many of the developments described in the report. Professor Kenny as well as further developing the Falls & Blackout Unit which was started by Dr. Conal Cunningham has been an inspired leader in the Technology and Research Unit for Independent Living (TRIL project) and in the Irish Longitudinal Study on Ageing (TILDA). Dr. Joe Harbison has made a major contribution to the acute management of patients with stroke and to clinical research and teaching in this area.

An International Advisory Group (IAG) for the new Centre was established in 2007. The International Advisory Group is headed up by Dr. Jeremy Playfer who is a recent past President of the British Geriatrics Society and a Consultant Physician in Geriatric Medicine from the Royal Liverpool University Hospital.

The other members of the International Advisory Group are as follows:-

Professor Irene Higginson, King's College London, James P Smith, RAND Corporation California, Dr. Finbarr Martin, Guys & St Thomas's Hospitals London, Professor Alistair Burns, University of Manchester, Dr. Kenneth Rockwood, Dalhousie University, Canada, Dr. Terrance J. Dishongh, Intel Corporation and Rodd Bond, Dundalk Institute of Technology.

The International Advisory Group will act as a best practice advisory group for the new Centre.

Memory Clinic

The Mercer's Memory Clinic continues to expand all of its activities in both service and research areas.

The cognitive studies clinic is a clinical memory service that is operated by Research fellows and nurses involved in the Brain Ageing research programme of MIRA. The clinic has been designed and implemented as a "rapid access" memory screening service, where patients are accepted from multiple referral sources on a national basis. Patients following referral have a complete medical review, neuropsychological testing, and neuro-imaging as appropriate.

The majority of patients (52%) who attended received a diagnosis of Mild Cognitive Impairment. The earlier patients are identified the easier it is to address and intervene in treatable causes and influence the course of the disease process.

Irene Bruce, our Clinical Nurse Specialist in the memory clinic, has been awarded an MSc in dementia studies from Bradford University.

The Enhancing Care in Alzheimer's Disease Study (The ECAD Study) has also got underway. This is a study of the economic, psychosocial and physical impact of Alzheimer's Disease (AD) upon patients and caregivers. It explores the economic, psychosocial and physical costs associated with AD with particular focus upon the frequently neglected informal caregiving support structures.

Preparation for a phase III trial of a novel immunotherapeutic agent for Alzheimer's Disease also took place in 2008. This is a randomised controlled trial in association with Wyeth pharmaceuticals in which patients with Alzheimer's Disease will be randomised to an infusion of Bapineuzumab (a beta amyloid specific antibody which facilitates clearance of beta amyloid plaques implicated in the pathogenesis of Alzheimer's Disease) or placebo.

Another study which is being carried out in collaboration with Trinity College Institute of Neuroscience and GSK pharmaceuticals is the measurement of the Differential Effects of Donepezil and Placebo on EEG/ERP Measures and Olfactory Discrimination in Mild Cognitive Impairment and Older Controls.

Our Watt's fellow Dr David Robinson is examining the B12-homocysteine axis and its association with levels of cognitive function. His MD proposal relating to this work has been accepted by Trinity College Dublin. Dr Conor O'Lunaigh is examining the phenomenon of loneliness in the Dublin Healthy Ageing cohort.

Muireann Irish was awarded a Ph.D. from TCD in 2008 for her Thesis on "The Development and Validation of the Episodic Autobiographical Memory Interview (EAMI) as an assessment of Episodic Autobiographical Recall".

Alberto Blanco-Campal has completed a study on Prospective and retrospective memory (remembering to do something in the future) in Mild Cognitive Impairment (MCI) and Vascular Cognitive Impairment (VCI). This study entailed development of a novel measure of Prospective Memory and he has submitted this work as a Doctorate Thesis in Clinical Psychology.

Dr. Robert Coen was a co-applicant with Dr. Fiadhait O'Keefe and colleagues in the National Rehabilitation Hospital and University College Dublin (Dr. Simone Catron, NRH, Principal Applicant) for a study of rehabilitation of awareness deficits in Traumatic Brain Injury (TBI) and Frontotemporal Dementia (FTD). A HRB Partnership grant was

awarded. A novel computer-based attention rehabilitation procedure was developed and piloted, in collaboration with colleagues in UCD, TCIN, and the Nathan Institute, New York, making modifications to the DART (Dual-task Attention to Response Task) incorporating multimodal feedback.

Dr. Robert Coen and Dr. Jennifer Edgeworth (Senior Neuropsychologist, Beaumont Hospital) in collaboration with the Occupational Therapy Dept, St. James's Hospital (SJH) and Residential Care staff in Beaumont Hospital studied the Efficacy of a Cognitive Stimulation Programme. Recent research had indicated that the results of structured Cognitive Stimulation Therapy (CST) compare favourably with drug trials for dementia in terms of improved cognition and quality of life.

The Roskamp project is investigating the safety and efficacy of Nilvadipine, a dihydropyridine calcium channel antagonist, in the treatment of mild/moderate Alzheimer's dementia is ongoing. Results from the trial were recently presented at the European Neurology Society meeting in Nice, and the British Geriatrics Society meeting in the U.K. and the Irish Gerontological society.

A HRB funded project on Translational Research in Neurovascular Instability is now under way. This is a 5 year longitudinal study of older persons with Mild Cognitive Impairment (MCI) examining the influences of chronic and episodic hypotension on baseline cognition and on progression/transition to dementia over 3 years follow up. Participants have annual neuropsychological assessments and neurocardiovascular assessments over 3 years. In addition, detailed neuro-imaging is performed at baseline and 3 years follow up.

Another Translational Research programme in Alzheimer's Disease funded by GSK (Glaxo Smith Kline) is also underway. This is a single centre study that is currently underway at the Mercers's Institute for Research in Ageing with collaboration from Trinity College Institute of Neuroscience and GSK pharmaceuticals. The objective of the study is to define the short-term effects of the existing Alzheimer's Disease (AD) symptomatic treatment compound donepezil on cognitive EEG/ERP endpoints and olfactory discrimination in normal elderly and amnesic mild cognitive impairment (aMCI) cohorts.

Falls and Blackouts, Bone Protection and Osteoporosis Service

The Bone Protection and Osteoporosis Unit incorporates several clinical and research areas. It runs an inpatient Falls and Fracture Prevention Service, a DXA Service, Clinical Nurse Led Preassessment Clinics, An Orthogeriatric Service and Specialised Bone Treatment Clinics.

A comprehensive assessment is performed and includes risk factors for osteoporosis, falls risk factors and advice on dietary and lifestyle modifications and education on treatment. This assessment includes a DXA scan, a bone ultrasound, a full biochemical and hematological workup including an estimation of serum bone markers.

Over 200 patients have finished their treatment or currently are on Parathyroid hormone (PTH) which acts as a bone building agent. These patients have severe osteoporosis and often have had multiple fragility fractures and have been refractory to other forms of treatment.

Recent research has demonstrated a dramatic improvement in quality of life and back pain with the use of PTH. St James Hospital was one of the Centres for the EFOS study whose results have recently shown improvement in both the quality of life and in back pain improvement in patients treated with PTH.

The Bone Health Unit has recently received support from Nycomed for a study on the benefits of the use of protein supplementation with PTH 1-84 in patients with severe osteoporosis.

IV Zoledronic acid is a promising drug in the treatment of osteoporosis and in the prevention of further fractures, with a significant reduction in mortality in patients after hip fracture. We have developed an IV Zoledronic acid clinic where patients are assessed prior to administration of the drug and for post infusion follow-up.

Nearly 200 treatments have been administered to date.

In the orthogeriatric service fracture patients who attend the Emergency Department or are admitted to the ward are seen on the ward and followed up in our bone health clinics. The service has grown to incorporate all osteoporotic fracture patients over the age of 50 years attending the hospital.

Hip fractures are associated with increased morbidity and mortality and tend to occur in older patients. Research within the department this year showed that over the previous 4 years approximately one sixth of patients required long term care and a further one sixth died within the first year after a hip fracture (Browne JG et al, IGS 2008). Hip fracture is a worldwide clinical problem common in the elderly and is set to double by the year 2040. It constitutes a major clinical and financial burden to health services accounting for 20% of orthopaedic bed stays world wide.

Ms Niamh Maher, Ms Sheila McCarthy and Dr Joe Browne are currently researching in the area of fragility fractures in the elderly with particular emphasis in hip fractures which will be detailed later.

Inpatients at high risk for falls are targeted for fall injury prevention once they are admitted under the care of the MedEL department. Each patient is screened for falls risk on admission - high-risk patients are thus identified and managed appropriately. The services provided by the team include balance and strength improvement classes, a falls educational programme for staff and patients, a hip protector compliance programme, a management strategy for agitated confused patients, a falls diary for each faller and nurse-led post-fall assessment and advice.

2008 has been an exceptionally busy year for DXA scanning with over 2000 scans being performed on community and inpatient referrals.

Our close links with consultant chemical pathologist Dr. Vivion Crowley and senior biochemist Dr. Martin Healy, who is an expert in bone biochemistry, have been indispensable in enabling us to perform comprehensive biochemical studies and bone markers on patients attending the various clinics within the Falls and Osteoporosis Service. These bone markers provide us with critical information on the rate of new bone formation and bone loss in individual patients.

The department of Biochemistry have just acquired a new Mass Spectrometer which will allow for more rapid measurement of Vitamin D and a greater range of analysis of Vitamin D metabolites and active forms of the Vitamin D hormone. We hope in 2009 to

avail of this new technology to look more in depth at vitamin D metabolism and Vitamin D deficiency in our patients with osteoporosis.

One of our major research areas is in hip fractures. Bone samples from fractured femoral hips are being studied. The use of quantitative CT scanning and nanoindentation will explore the microarchitecture and mineralisation of each hip. This is a collaborative research partnership between the Departments of Mechanical and Tissue Engineering in Trinity College, Dublin and the Department of Anatomy in the Royal College of Surgeons.

Several studies in the department in recent years have shown that there is a large proportion of patients with vitamin D deficiency. Up to one third of patients have severe vitamin D deficiency and almost three-quarters have a level less than the lowest limit of normal. Vitamin D in recent years has been shown to be associated with conditions in several areas outside bone health e.g. muscular weakness, falls, reduced cognition, mood disorders, increased risk of cancer (particularly breast and bowel cancer), and orthostatic hypotension. This year we plan to study the effect of vitamin D supplementation in the older person, focusing on bone health, falls reduction and improvement of blood pressure. Ms Niamh Maher, Clinical Nurse Specialist, has commenced a PhD which will be based on a study of optimising the management of hip fracture patients.

The osteoporosis service has also commenced a study in conjunction with Ms Laura Corrigan and Dr Jackie Daly in RCSI looking at biomarker proteins in normal, osteopaenic and osteoporotic bones. It is hoped to identify proteins and molecules that may aid in screening patients for osteoporosis in the future.

Two of our Clinical Nurse Specialists in Bone Health Ms Georgina Steen and Ms Nessa Fallon have completed their MSc degree in Gerontological Nursing in 2008. Ms Kara Fitzgerald is currently studying for an MSc in Falls and Osteoporosis and Ms Sheila McCarthy is working in conjunction with Ms Niamh Maher in the assessment of patients with hip fracture with the view of acquiring an MSc in Physiotherapy.

Dr Joe Browne our Clinical and Research Bone Fellow received the Professor John S. Pritchard Medal for Clinical Tutor of the Year 2007 -2008. This prize is awarded by The Medical School to the "Teacher of the Year" selected by the final year medical students class. The Bone Health Unit was involved in organising two major conferences during the year. The first was a European Conference on Steroid Induced Osteoporosis which was held in Dublin in November 2008. The Second Meeting was an International Hip Fracture Prevention Meeting at which Prof J Bernard Walsh and Dr Miriam Casey both spoke.

The Falls and Blackout Unit runs daily Blackout and Falls Clinics where patients with unexplained falls and blackouts are investigated using state of the art cardiovascular technology. The clinics are staffed by Prof Rose Anne Kenny and Dr Conal Cunningham, Clinical and Research Registrars and two Clinical nurse specialists. Activity continues to increase significantly with the main source of referrals coming from the emergency department, inpatient referrals, GPs, cardiology services, neurology services, MedEL services and peripheral hospitals from all around the country. It provides the largest syncope clinic service within Ireland. There has been an 18% increase in patient throughput in 2008 alone.

Ciarán Finucane is pursuing a PhD in MIRA, studying syncope and falls under the joint supervision of Professor Rose Anne Kenny, Dept. of Medical Gerontology, TCD and Dr Gerard Boyle, Medical Physics and Bioengineering, St James's Hospital.

The theme of this research strand is the design and development of clinical tools and techniques for the investigation of NeuroCardiovascular Instabilities (NCVI's) in the Falls and Blackout Unit (FABU).

As an alternative to Carotid Sinus Massage (CSM) a non-invasive digital signal processing technique for the diagnosis of Carotid Sinus Syndrome has been designed, and has undergone initial clinical trials in FABU. Findings were presented at local, national and international scientific conferences in 2008. Studies to improve the diagnostic potential of the technique have been completed in collaboration with Dr. Orla Collins and Dr. Clodagh O'Dwyer in the Falls and Blackout unit.

Dr. Chei Wei Fan was awarded a Doctor of Medicine in November 2008 from Trinity College Dublin. Her thesis was entitled 'Sleeping with the Head of the Bed Tilted Up - Physiology and Therapy'. The thesis was based on work she had undertaken in the Falls and Blackout Unit. Her thesis was supervised by Dr. Conal Cunningham.

Stroke Service

The stroke service has continued to progress over the last year assessing and caring for over 400 inpatients and over 1000 outpatients. Development of the stroke service has resulted in a reduction in mortality of one-third and a reduction in average length of stay of more than one week.

An intravenous thrombolysis service is now in place and the intraarterial service has been further developed. In addition we have introduced a nurse led secondary prevention service for cerebrovascular disease and run a daily neurovascular and Transient Cerebral Ischemic Attack (TIA) service.

The service continues its active research programme and recent papers were published in the Quarterly Journal of Medicine (QJM) and the Irish Journal of Medical Science and a number of further studies are being prepared for publication. A Study on the neuroprotective effects of erythropoietin in cooperation with the department of Renal Medicine is underway and we have recently appointed a research nurse Ms Sally Couper to help run the study. Sally will be undertaking her MSc. based on this research.

Other continuing research projects include acute imaging of stroke patients, rehabilitation of stroke patients, and hypotensive stroke. Dr Harbison is coordinator of the new Diploma in Cerebrovascular and Stroke Medicine of the Royal College of Physicians of Ireland, which commences in September 2009 and he is on the development committee for national guidelines and standards of stroke care in the Stroke Council of the Irish Heart Foundation. This is being developed in conjunction with the Health Services Executive (HSE).

Medical Physics and Biomedical Engineering.

Dr Niamh Collins and Mohammed al-Kalbani are continuing their research into ocular microtremor under the supervision of Prof Davis Coakley and Dr Gerard Boyle. Ocular Microtremor (OMT) is a minute eye movement related to brainstem function with diagnostic and prognostic potential in brainstem disease. The OMT research group received a significant boost in 2008 with a €128,000 Research Frontier grant awarded by Science Foundation Ireland (SFI) to Dr. Boyle as Principal Investigator.

Research studies carried out in 2008 included the correlation between ocular microtremor activity and electroencephalography (EEG) in healthy subjects and clinical

studies of OMT in patients with stroke, visual impairment and ocular motor disorders. All OMT measurements were carried out using technology designed and built at MIRA. Collaborative links have been established with Professor Susana Martinez-Conde, a leading visual neuroscientist in Phoenix, Arizona.

Bioengineering is also evaluating and adapting technology for health gain and clinical applications with older people. This work focuses engineering and clinical expertise on clinical problems. Projects include a Balance Assessment Tool for Clinicians and In-Home Balance Assessment, A Biofeedback System to Improve Gait in Older Adults with Parkinson's disease and a Graphical Biofeedback in Stroke Rehabilitation.

As described above Ciarán Finucane, one of our bioengineers, is pursuing a PhD in MIRA studying syncope and falls.

In addition, studies have been conducted in the cardiovascular unit to develop a sensitive and reliable carotid baroreceptor stimulator to improve carotid sinus massage. Medical Bioengineering is also closely working with the Technology Research for Independent Living Unit as described below. A virtual tilting environment has been developed that allows the recreation of the perceived visual and auditory effects of tilt-table testing and measures their influence on autonomic function.

Technology Research for Independent Living (TRIL)

TRIL is a virtual centre of expertise and research into improving the health and happiness of older people. TRIL is a collaborative effort combining Intel personnel and researchers from Irish universities and hospitals in multi-disciplinary teams. TRIL focuses on understanding and delivering on the support needs and preferences of older people at home and in care environments. TRIL's mission is to discover and deliver technology solutions which support independent ageing, ideally in a home environment. This will improve the quality of life of older citizens while reducing the burden on carers and on the healthcare system.

The strands within the TRIL centre projects address the three key domains in ageing: physical, cognition and social connectivity.

The TRIL clinic is based in MIRA and started in August 2007. 482 persons aged 60 and over have undergone comprehensive assessments (physical/cognitive/psycho-social) - of those 378 were recruited in 2008.

Of the first 404 participants, 54.4% of them are defined as 'fallers', i.e. they have a history of falls or are at risk of falls. The mean age was 73.4 years and fallers were on average 5 years older than controls (75.6 years vs. 70.7 years). Feedback is provided to all participants after they completed the assessment and if necessary they are referred on to appropriate medical clinics and day hospital for further management.

On completion of the 600 recruits, the TRIL clinic will continue to assess older people to recruit them into three major home phases of the research programme where we employ TRIL developed technology to monitor, to provide feedback and to intervene to promote independence in older people. The clinical facility will be used as a setting to evaluate the outcome of the home deployment projects.

The feedback from the participants following their experience in the clinic was extremely positive. This is reflected in a telephone survey of 50 random TRIL participants. More than 80% of them would definitely refer their friends and social network to the TRIL experience. TRIL clinic launch was in February 2008 by Minister for Older Persons, Ms Maire Hocht. One of the researchers in TRIL, Dr Roman Romero-Ortuno was awarded

the best platform presentation in the Irish Gerontological Society Meeting in Kilkenny. The TRIL clinic was recognised for its use of technology in health screening for older people and was awarded the first prize in the technology category in the Irish Healthcare Award in October 2008.

The Irish Longitudinal Study on Ageing

The Irish Longitudinal Study on Ageing (TILDA) is a major initiative led by Trinity College Dublin which will provide high quality research relating to older people and ageing in Ireland. It involves collecting baseline data and updates on a two yearly basis from a large cohort of people aged 50 and over will be collected. Detailed information on all aspects of their lives, including the economic dimension (pensions, employment, income and assets, etc.), health aspects (physical, mental, service needs and usage, etc.) and social aspects (contact with friends and kin, formal and informal care, social participation, etc.). TILDA is funded by Atlantic Philanthropies, Irish Life and the Department of Health.

A nationally representative sample of 8,000 to 10,000 adults aged 50 and over, resident in Ireland, are being selected.

Participants selected for the main TILDA study will have a follow-up interview every two years and health assessment every four years for a ten year period. Given the innovative nature of the study, and especially the health assessment element, it was deemed necessary to carry out a number of pilots. Pilot 1 went into the field in July 2008. The key achievements of the pilot included the successful design and training of field and nursing staff in administering the questionnaire and the establishment of the TILDA Health Assessment Centre. Other developments are described in the main body of the report.

In the first TILDA pilot, respondents completed a face-to-face interview and self completion questionnaire in their home, and were then invited to attend a dedicated TILDA Health Assessment Centre in Trinity College Dublin for a health assessment. Of the 142 Social Interviews conducted in the Pilot, 89 participants volunteered for the health assessment.

The Economic and Social Research Institute (ESRI) and The Irish Longitudinal Study on Ageing (TILDA) organised a workshop on 'Labour Market Implications of Demographic Ageing'. This event was organised in the context of the European Science Foundation 'Forward Look' on 'Ageing, Health and Pensions in Europe'

The TILDA Health in Ageing Conference, which was opened by The Minister for Health Mary Harney was held in May 2008 in association with Trinity College Dublin, Science Foundation Ireland and the Centre of Excellence for Successful Ageing, St James's Hospital. The two day programme covered a wide variety of interdisciplinary topics including cardiovascular health, cognitive health and mental health as well as identifying future directions within the field of ageing research.

The Trinity, University of Ulster and Department of Agriculture Study – TUDA

The TUDA study is a collaboration between Mercer's Institute, Trinity College Departments of Medical Gerontology, Old Age Psychiatry and Biochemistry), University of Ulster and the Department of Agriculture in which a genotype and phenotype database of 6,000 subjects with certain diseases over 60 years will be collected. Four thousand subjects 2,000 with cognitive impairment and 2,000 with brittle bones will be recruited

from out-patients attending the MedEL Directorate at St James's Hospital and two thousand subjects with hypertension will be recruited from GP practices in Northern Ireland between 2009-2011.

Detailed physical and cognitive assessments as well as biomarkers and genetic markers will be collected. Once completed the database will represent a very important resource for further investigation of these diseases and will be one of the largest of its type in Ireland.

Acknowledgements

This report covers the work of the 20th year of the Mercer's Institute for Research on Ageing. I would like to acknowledge all who have enabled the work of the Institute over this time.

A special thanks to the staff of MIRA both past and present who have contributed so much to the health of elderly patients and to the study of ageing in this country and abroad.

It is a cause of great joy and satisfaction to see so many people working in the health care of ageing in this country who have previously worked in the Mercer's Institute. Many current consultants, senior nursing and therapy staff once worked in the Mercer's Institute.

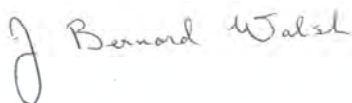
I would like to thank the Health Research Board, Science Foundation Ireland, Health Services Executive and the Department of Health for the grant funding and support that they have given us over the years for the different research proposals and projects.

In particular we would like to thank the Board and Executive of St. James's Hospital for the facilities and the resources to enable so many of the clinics to develop and facilitate the delivery of the broad range of services that we currently provide in the different units and clinics.

Atlantic Philanthropies have made a major contribution to the increased staffing of the Institute and their commitment to the development of the new Centre of Excellence for Successful Ageing has given great impetus to the realisation of plans that have been in gestation for the last quarter of a century.

This support and the new staffing has opened up new horizons in our programmes on ageing and the services that we are able to provide for elderly patients.

A very special word of thanks to the Board of the Mercer's Hospital Foundation. Without their support the Mercer's Institute would never have started. The income that we receive on an annual basis from the Mercers Hospital Foundation has been the corner stone of each of the developments and it remains our main source of regular income.



J. Bernard Walsh
Director

Memory Clinic

Clinical Activity

A total of 362 patients were seen in the Memory clinic in 2008, 191 were new referrals to the clinic, the remainder were return patients.

The vast majority of patients who attended (n =188) received a diagnosis of Mild Cognitive Impairment. 52 patients had a diagnosis of Alzheimer's disease and 23 had a diagnosis of mixed dementia. There were 2 patients with Lewy Body dementia, 18 patients with Fronto-Temporal dementia and two patients with sub cortical dementia. The remainder of the patients had functional illness mainly anxiety/depression or had subjective memory complaints. There were 12 patients where the diagnosis was unclear.

The large number of people with a diagnosis of MCI possibly reflects a greater public awareness of the early signs of dementia and a desire for the early assessment and diagnosis service provided by the clinic.

Change of clinical practice in assessment of patient function in Memory Clinic.

Irene Bruce Clinical Nurse Specialist in the memory clinic has been awarded an MSc in dementia studies from Bradford University. As a result of this research clinical practice has changed in the memory clinic.

Until recently patients functional abilities were assessed in the memory clinic by using a rating scale (Instrumental Activities of Daily Living), which was completed by the carer. However functional assessment by proxy has been shown to be open to bias and therefore in order to make a more accurate diagnosis clinical practice has been changed to incorporate a direct assessment of function in the memory clinic. Direct assessment involves the patient carrying out routine tasks while being assessed by a trained rater. The direct assessment measure chosen is the Naturalistic Action Test (NAT). The NAT was developed to assess functional impairment in people with higher cortical impairment. It is a standardised performance based measure of everyday function that evaluates activities of daily living across three tasks. The three tasks include making toast and coffee, wrapping a gift and packing a lunchbox and schoolbag. The maximum score is 18 indicating no errors on any of the three tasks. Normative data for adults over the age of 60 was reported as ≥ 14 .

This direct assessment of function expands the assessment provided by the memory clinic and is used where there is discrepancy between cognitive scores and proxy account of function.

Research Activity

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

Overview

This is a study of the economic, psychosocial and physical impact of Alzheimer's Disease (AD) upon patients and caregivers. The changing demographics of Irish society mean that the prevalence of AD is increasing with ever-greater numbers of patients in the moderate to severe stages of disease. The majority of this burden of caregiving is currently borne by informal caregivers working in the home with little professional input or support from formal services. A small change in the distribution of this burden of care could have

significant implications for the demands placed on already oversubscribed healthcare resources such as residential care. This study seeks to explore the economic, psychosocial and physical costs associated with AD with particular focus upon the frequently neglected informal caregiving support structures which are so essential to the care of patients. This study will collect data from 200 patient/carer dyads recruited from the Medicine for the Elderly and Psychiatry of Old Age services in St James's Hospital who will be stratified according to severity of AD. It will measure patient and caregiver variables associated with increasing costs and with adverse biopsychosocial outcomes such as poor physical health, depression, caregiver burden and other predictors of early withdrawal from the caregiving role and patient institutionalisation. Data will be collected at baseline and again at 6 months. There is currently little information of this nature in the Irish context. It is hoped that an increased understanding of the financial, social, physical and psychological challenges faced by caregivers will facilitate more effective planning of interventional strategies to achieve improved outcomes for patients and caregivers alike. It should equally inform decision-making regarding the most effective deployment of existing healthcare resources in the Irish context.

Progress so far

This study represents a collaboration between the Mercer's Institute for Research on Ageing, Elan pharmaceuticals and the Irish Centre for Social Gerontology at the National University of Ireland, Galway. The Principal Study Investigator is Professor Brian Lawlor and additional investigators on this project are; Dr Damien Gallagher, Dr Aine Ni Mhaolain and Ms Lisa Crosby SRN. Planning and Ethics approval for this study have been completed and recruitment is due to start in January 2009. Dr Damien Gallagher and Dr Aine Ni Mhaolain are currently drafting MD proposals based upon the above study for Trinity College Dublin.

In addition to his work on the Enhancing Care in Alzheimer's Disease Study, Dr Damien Gallagher is an investigator in a phase III trial of a novel immunotherapeutic agent for Alzheimer's Disease. This is a randomised controlled trial in association with Wyeth pharmaceuticals in which patients with Alzheimer's Disease will be randomised to an infusion of **Bapineuzumab** (a beta amyloid specific antibody which facilitates clearance of beta amyloid plaques implicated in the pathogenesis of Alzheimer's Disease) or placebo. Recruitment to this trial is anticipated to begin in April 2009 pending regulatory approval.

Dr Damien Gallagher has also co-authored an editorial entitled "The Imperative for Disease Modifying Therapies in Alzheimer's Disease" with Dr Aine Ní Mhaolain and Professor Brian Lawlor which has been accepted for publication in the Irish Medical Journal. He is also completing an analysis of existing epidemiologic data of patients assessed utilising the Geriatric Mental State clinical interview through the Mercer's Institute for Research on Ageing. In particular this study will test hypotheses regarding the aetiological and phenomenological characteristics of early and late onset depressive disorder. He is also collaborating on a review article regarding the epidemiology, economic consequences and proposed patho-mechanisms of falls in Alzheimer's Disease.

Differential Effects of Donepezil and Placebo on EEG/ERP Measures and Olfactory Discrimination in Mild Cognitive Impairment and Older Controls:

Overview:

This is a single centre study that is currently underway at the Mercers Institute for Research in Ageing with collaboration from Trinity College Institute of Neuroscience and GSK pharmaceuticals. The objective of the study is to define the short-term effects of the existing Alzheimer's Disease (AD) symptomatic treatment compound donepezil on cognitive EEG/ERP endpoints and olfactory discrimination in normal elderly and amnesic mild cognitive impairment (aMCI) cohorts. The overall goal of the study is to develop EEG/ERP measures that can detect pharmacodynamic effects in subjects with (aMCI) and elderly controls, after short-term treatment with medications that have been approved for symptomatic treatment in AD. These measures can then be used for the future assessment of potential novel treatments for AD. The principal study investigators are Professor Brian Lawlor, Professor Rose Ann Kenny. Additional investigators on this project are Professor Ian Robertson, Redmond O'Connell (Research Fellow TCIN) , Dr Mary Martin, Orlaith Keane SRN and are assisted by clinic coordinator Bernadette Quinn.

Progress so far:

This study has a double blind randomised parallel group design. Twenty aMCI patients will be randomly allocated to two parallel groups. One group will receive placebo, and the second group will receive 5mg donepezil /day for 4 weeks. Cognitive EEG/ERP testing will occur pre-drug treatment and at 6 hours , 2 weeks and 4 weeks during treatment. A standardised smell test will be carried out at baseline and then following 2 and 4 weeks of treatment. There will be an identical design for 20 normal elderly control subjects. To date two normal elderly control subjects have completed the study as well as one aMCI patient. A further seven patients have been recruited consisting of five a MCI patients and two normal controls. The recruitment process is ongoing via the memory clinic at St James's Hospital.

Psychotropic Medication Use in Community Dwelling Elderly Patients:

In conjunction with work on the ECAD study we are also investigating data collected as part of the Dublin Healthy Ageing Study wave 1 on the use of psychotropic medication use in community dwelling elderly patients. The principal aim of this study is to use Beers' criteria the current gold standard in prescribing guidelines for the elderly to identify the prevalence of potentially inappropriate prescriptions of psychotropic medication in a cohort of older non-demented community dwelling people. We also aim to identify the types of inappropriate psychotropics most commonly prescribed and the risk factors for receiving them within this population. Our third objective is to identify the rate of undiagnosed or inadequately treated depressive and/or anxious symptomatology and its correlation with inappropriate prescribing practices. Preliminary findings of this work have been presented at the All Ireland Institute of Psychiatry Winter Meeting in November 2008.

The Dublin Healthy Ageing Study

Data collection has been completed on the second wave of the Dublin Healthy Ageing Study, with laboratory analysis nearing completion. A total of 252 participants agreed to a second assessment. 44 participants had died prior to wave 2, allowing for a follow-up rate of 63.5 %. This is comparable to other community-based studies. Dr Ai-Vrin Chin examined relationships between homocysteine and measures of cognition - this paper has been published in *Age and Ageing*. Dr David Robinson is examining other correlations of cognitive function, in particular the B12-homocysteine axis. His MD proposal relating to this work has been accepted by Trinity College, Dublin. Dr Conor O'Lunaigh is examining the phenomenon of loneliness in the Dublin Health Ageing cohort.

Autobiographical Memory studies.

Muireann Irish was awarded a Ph.D. from TCD in 2008. Thesis: The Development and Validation of the EAMI as an assessment of Episodic Autobiographical Recall. Supervisors: Prof. Brian Lawlor; Prof. Shane O'Mara; Dr. Robert Coen

Muireann Irish and Dr. Robert Coen developed and validated a novel measure of autobiographical memory, the Episodic Autobiographical Memory Interview (EAMI). The work was successfully submitted by Muireann Irish as her PhD thesis, registered under Prof. Brian Lawlor, Dept. of Psychiatry, Trinity College Dublin (TCD), with joint supervision from Dr. Robert Coen and Dr. Shane O'Meara, (Psychology Dept, TCD). The various findings are currently been written up in several papers which have been or will be submitted for publication.

Specifically, a novel measure was developed based on recent conceptual refinements, for which most existing measures are inadequate. The validation study compared healthy young and healthy elderly individuals and individuals with mild Alzheimer's disease. A second study investigated autobiographical memory and its neuropsychological correlates in Mild Cognitive Impairment (MCI). Findings have been presented throughout the course of the work at various National and International scientific meetings (see previous MIRA reports). In 2008 the first paper from this work was published in *Behavioural Neurology* (see Publications, Irish et al). A number of other papers are in various stages of preparation or have been submitted for publication.

Prospective Memory studies.

Prospective and retrospective memory in Mild Cognitive Impairment (MCI) and Vascular Cognitive Impairment (VCI). This study entailed development of a novel measure of Prospective Memory (remembering to do something in the future) and its application in MCI/VCI. Alberto Blanco-Campal completed this work in 2006 which he submitted for his research Thesis in part fulfillment for a Doctorate in Clinical Psychology, University College Dublin (joint supervision: Dr. Teresa Burke, Psychology Dept., UCD and Dr. Robert Coen). He was awarded a distinction and has qualified as a Clinical Psychologist. Findings were previously presented at two national scientific meetings (see previous MIRA reports). In 2008 the main findings have been accepted for publication in the *Journal of the International Neuropsychological Society* (see Publications, Blanco-Campal et al)

Post-stroke outcomes in the community.

Dr. Robert Coen collaborated with Dr. Conal Cunningham and Dr. Francis Horgan on a study investigating post-stroke outcomes in the community. Claire Tobin, a Final Year

Psychology Undergraduate undertook the work which was successfully submitted as her Final Year Research Thesis in addition to producing a report for the Voluntary Stroke Scheme (VSS) by whom the research was sponsored. Findings were previously presented at two national scientific meetings (see previous MIRA reports). In 2008 the findings were published in the Irish Journal of Medical Science (see Publications, Tobin et al.)

Awareness in Traumatic Brain Injury and Frontotemporal Dementia.

Dr. Robert Coen was a co-applicant with Dr. Fiadhnaid O'Keefe and colleagues in the National Rehabilitation Hospital and University College Dublin (Dr. Simone Catron, NRH, Principal Applicant) for a study of rehabilitation of awareness deficits in Traumatic Brain Injury (TBI) and Frontotemporal dementia (FTD). A HRB Partnership grant was awarded. Ethics approval was obtained. Mary Fitzgerald (Higher Diploma in Psychology) was employed as the primary researcher. A novel computer-based attention rehabilitation procedure was developed and piloted, in collaboration with colleagues in UCD, TCIN, and the Nathan Institute, New York, making modifications to the DART (Dual-task Attention to Response Task) incorporating multimodal feedback. Data collection on the study proper commenced in November 2007 and is ongoing. In 2008 preliminary findings were presented at two scientific meetings, the British Psychological Society Annual Conference, Dublin, April 2008, and the Psychological Society of Ireland Annual Conference, Carlow, November 2008 (see Presentations).

Cognitive & Psychological Health aspects of The Irish Longitudinal Study of Ageing (TILDA)

Dr. Robert Coen is on the Cognition and Psychological Health Work Group (in conjunction with Prof. Roseanne Kenny, Principal Investigator, Prof. Ian Robertson, Prof. Brian Lawlor and colleagues) to determine procedures and tests for the cognitive and Psychological health aspects of the TILDA study. This is a TCD led National collaborative longitudinal project aiming to investigate and follow up 10,000 participants over a 10 year period. The cognitive battery was finalised and a pilot study was recently completed and reviewed.

Verbal Fluency, Age of Acquisition (AoA) as a predictor of cognitive decline.

In light of recent research indicating that age of acquisition (AoA) was the aspect of semantic category fluency that best discriminated individuals with Alzheimer's disease (AD) from healthy elderly controls, Vanessa Buckley, a Final Year Psychology student in TCD, carried out research under supervision of Dr. Robert Coen and Prof. Shane O'Meara, examining AoA in AD using data from our Clinical database. Control participants were recruited from DHAS2 participants who were agreeable to be contacted regarding further research studies. Part of the work was supported by a HRB Summer Studentship grant obtained by Dr. Coen. Vanessa Buckley successfully submitted the work as her Final Year Undergraduate Thesis. In 2008 the findings were presented at three scientific meetings, Poster Presentation (RC) TILDA Health In Ageing Conference, Dublin, May 2008. Poster Presentation (VB) Federation of the European Societies of Neuropsychology, Edinburgh Sept 2008. Platform presentation (VB) Psychological Society of Ireland Annual Conference, Carlow, November 2008 (see Presentations). A paper is in preparation.

Efficacy of a Cognitive Stimulation Programme.

This is a research study devised by and jointly supervised by Dr. Robert Coen and Dr. Jennifer Edgeworth (Senior Neuropsychologist, Beaumont Hospital) in collaboration with

the Occupational Therapy Dept, St. James's Hospital (SJH) and Residential Care staff in Beaumont Hospital. Recent research has indicated that the results of structured Cognitive Stimulation Therapy (CST) compare favourably with drug trials for dementia in terms of improved cognition and quality of life (Spector et al 2003). The present research was a preliminary case-control evaluation of CST in individuals with mild to moderate dementia in day hospital and residential settings. The findings were strikingly positive given the small sample sizes entailed. In 2008 the findings were presented at three scientific meetings, The Association of Occupational Therapists of Ireland Annual Conference 2008, The Irish Gerontological Society Conference, Kilkenny, Sept 2008, and The Psychological Society of Ireland Annual Conference, Carlow, November 2008.

Falls, Bone Protection, and Osteoporosis Service

The Bone Protection and Osteoporosis Service has expanded over the last few years incorporating several clinical and research areas as outlined in figure 1. The Service has become involved in several national and international studies relating to osteoporosis and treatments.

Summary of Service

- Nurse-Led Preassessment Clinics
 - Parathyroid Hormone Treatment Patients
 - Intravenous Zoledronic Acid Clinic
 - Orthogeriatric Service
 - Early Discharge Service for Acute Medical Admission Unit (AMAU)

- Inpatient Falls and Fracture Prevention Service
- DXA Service
- Research Areas

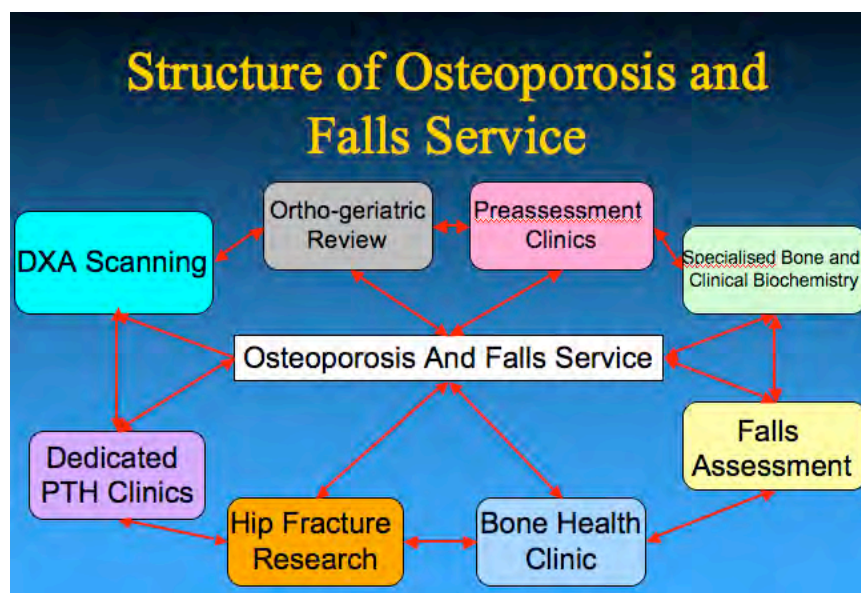


Figure 1. The above diagram shows the various clinics that are available within the Osteoporosis and Falls Service in St James Hospital. The service has greatly expanded in recent years with each section being integral for optimising the treatment of patients.

Clinical Nurse Specialist (CNS) - Led Preassessment Clinics

CNS-led pre-assessment clinics continue to be the first point of contact for patients who are referred for assessment of their bone health. A comprehensive assessment is performed and includes risk factors for osteoporosis, falls risk factors and advice on dietary and lifestyle modifications and education on treatment.

On a patient's first attendance at this clinic a full initial screen is undertaken. This includes a DXA scan, a bone ultrasound, a full biochemical and hematological workup including an estimation of serum bone markers.

In 2008, a total of 638 patients were seen in these clinics, 482 new and 156 returns. Of these, 49 presented initially with a Colles fracture, a further 20 had upper limb fracture and 85 had a hip fracture.

Parathyroid Hormone Treatment Patients

Over 200 patients have been on or currently are on treatment with Parathyroid hormone. These patients have evidence of severe osteoporosis, which may have been refractory to other forms of treatment or have evidence of multiple fragility fractures. For patients who have sustained vertebral fractures there has been an improvement in bone quality and also a marked improvement in back pain in the majority of patients. Since late last year, there has been a second PTH option available Preotact (1-84 PTH), which gives further options in the management of patients with osteoporosis.

The Bone Health Unit has recently received support from Nycomed for a study on PTH 1-84 used in combination with protein supplementation in patients with severe osteoporosis. This study will begin in the summer of 2009.

Recent research has demonstrated a dramatic improvement in quality of life and back pain with the use of PTH. St James Hospital was one of the Centres for the EFOS study whose results has recently shown improvement in both the quality of life and in back pain improvement in patients treated with PTH (1-34) (Forsteo).

Intravenous Zoledronic Acid Clinic

IV zoledronic acid has been a promising drug in the treatment of osteoporosis and in the prevention of further fractures, with a significant reduction in mortality in patients after hip fracture. It may be given 6 monthly and yearly and we have developed an IV zoledronic acid clinic where patients are assessed prior to administration of the drug and orders a post infusion which is usually transient. Previous studies have shown that up to 10% of patients may have a complication after the infusion.

As part of the treatment protocol, patients are referred to Robert Mayne Day Hospital (RMDH) for IV zoledronic acid. In July, a new protocol was implemented to monitor Serum Calcium and Vitamin D levels within one week following infusion to observe any hypocalcaemia. Nearly 200 treatments have been administered to date.

Orthogeriatric Liaison Service.

The orthogeriatric service has been present within St James's Hospital for over 6 years. Patients who have sustained a fracture and who are admitted under our orthopaedic colleagues service are reviewed on the ward or can be followed up if discharged from the Emergency Department. The more common fractures seen include hip, Colles, vertebral, humeral and pelvic fractures. The service has grown to incorporate all fracture patients

over the age of 50 years attending the hospital. Each of these patients are offered a detailed screening for osteoporosis including DXA scan, biochemical markers and follow-up in the bone health clinics.

Hip Fractures

Hip fractures are the most common fracture that are seen within the orthogeriatric clinics and ward rounds. Hip fractures are associated with increased morbidity and mortality and tend to occur in older patients. Research within the department this year showed that over the previous 4 years approximately one sixth of patients required long term care and a further one sixth died within the first year after a hip fracture (Browne JG et al, IGS 2008). Hip fractures account for nearly 10% of all non vertebral fractures and for a much higher proportion of fractures in the elderly. Hip fracture is a worldwide clinical problem common in the elderly and is set to double by the year 2040. It constitutes a major clinical and financial burden to health services accounting for 20% of orthopaedic bed stays world wide.

With the above issues, Ms Niamh Maher, Ms Sheila McCarthy and Dr Joe Browne are currently researching in the area of fragility fractures in the elderly with particular emphasis in hip fractures, which will be detailed later.

Table 1. Number of Hip Fractures admitted to St James’s Hospital since 2005

	2005	2006	2007	2008
Hip Fractures	164	196	167	172

Colles and Peripheral Fracture Follow-up Clinic

All elderly patients presenting with a peripheral fracture, particularly those who present with Colles fracture 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 the results of their assessments.

Early Discharge Service for Acute Medical Assessment Unit

Patients are assessed by a CNS and referred to the Robert Mayne Day Hospital on discharge, where they can receive further assessments by an occupational therapist, physiotherapist, medical social worker, and dietician. They will also receive a nursing and medical review when attending the RMDH.

Inpatient Falls and Fracture Prevention Service

Inpatients at high risk for falls are targeted for fall injury prevention once they are admitted under the care of the MedEL department. Each patient is screened for falls risk on admission using a fall risk assessment tool (STRATIFY). High-risk patients are thus identified and managed appropriately. We work within a multidisciplinary team to assess, educate and rehabilitate patients to prevent future falls in those at risk. The services provided by the team include balance and strength improvement classes, falls educational programme for staff and patients, hip protector compliance programme, management strategy for agitated confused patients, falls diary on each faller and a nurse-led post -fall assessment and advice.

Summary of Inpatient Falls and Fracture Prevention in 2008

- Total of 332 post-fall assessments carried out: 134 new patients assessed, 198 reviews on recurrent fallers.
- 20 falls in Connolly Norman Ward (PsychEL).
- Injurious falls (MedEL & Connolly Norman): 66 (20%)
- Injuries among in-patients: 7 hip fractures, 1 Colles fracture
- Remaining injuries included bruising, lacerations, haematomas and soft tissue.
- Twice-yearly audits on falls risk assessment and hip protector compliance are conducted.

Fall Prevention Strategies in use throughout MedEL

- Fall alert sign over bed
- Fall (orange) wristband wearing by patients at risk of falls.
- 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 re patient who has been admitted with a fall/ 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.

DXA (Clinical Densitometry Service) Service

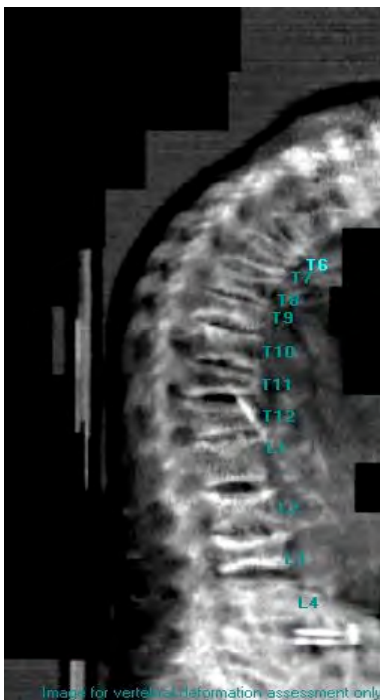


Figure 2.

An example of a patient who had a LVA performed showing several severe vertebral fractures

2008 has been an exceptionally busy year for DXA scanning with over 2000 scans being performed on community and inpatient referrals.

This service is available to patients within St James's Hospital, attached hospitals, and also to patients referred by their general practitioners in the community.

To date over 7500 scans have been performed since 2003. It provides a free service for patients within the local catchment area.

One advantage of our scanner is the use of Lateral Vertebral Assessment (LVA) as demonstrates in the picture opposite. This aids in highlighting patients that may require more intensive treatment and demonstrate fragility fractures which may not be seen on routine DXA. Recently we have shown that over a third of hip fracture patients attending St. James's Hospital have had vertebral fractures prior to sustaining a hip fracture.

If this had been known prior to the fracture, these patients may have been commenced earlier on therapy for osteoporosis and thus lessen the possibility of a subsequent hip fracture.

St. James's Clinical Biochemistry Department and MIRA

Our close links with consultant chemical pathologist Dr. Vivion Crowley and senior biochemist Dr. Martin Healy have been indispensable in enabling us to provide the comprehensive biochemical studies and bone markers on patients attending the various clinics within the Falls and Osteoporosis Service.

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 hormone 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. His 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 have just 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. We hope in 2009 to avail of this new technology to look more in depth at vitamin D metabolism and Vitamin D deficiency in our patients with osteoporosis.

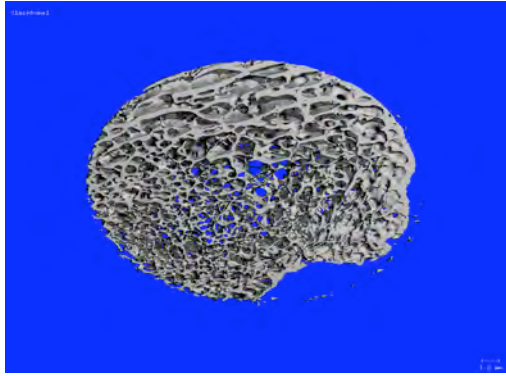
Research Areas

“Bone for Life” Group

This is a collaborative research partnership between the Departments of Mechanical and Tissue Engineering in Trinity College, Dublin, the Department of Anatomy in the Royal College of Surgeons and Department of Veterinary Medicine in University College, Dublin. Members of the group include Professor Patrick Prendergast, Professor Clive Lee and Professor David Taylor, Prof. Fergal O'Brien and Dr. Jackie Daly. This work covers research in animal models of osteoporosis and links this knowledge with the study of therapeutic compounds, which are used in humans who are affected by this disease.

Investigating Bone Quality in Hip Fracture and Osteoarthritis Patients Principal Investigator: Dr Joe Browne

Hip fractures are often a consequence of reduced bone quality and increased propensity to falls. However not all these patients show evidence of osteoporosis on DXA. Previous studies within the Osteoporosis Service have shown that approximately 30% of patients do not have osteoporosis on subsequent DXA scanning after the fracture. Bone samples from the femoral heads of hip fracture patients are being used to assess the quality of bone in these patients comparing them to the DXA results and will add to understanding of the biomechanics of bone structure and bone quality of these patients. The use of quantitative CT scanning and nanoindentation will explore the microarchitecture and mineralisation respectively. Figure 3 demonstrates quantitative CT scanning and a Further analysis of the bone will be performed in conjunction with the Department of Pathology and Dr Mary Toner where samples will be examined for evidence of underlying metabolic bone disease.



A second aspect of the study will commence this year looking at bone biochemistry and structure alterations involved in osteoarthritis and how anecdotally osteoarthritic patients are protected from fracturing bones, particularly hip bones. Patients with osteoarthritis in the hip are 6 times less likely to fracture compared to patients who do not have osteoarthritis.

Figure 3. Quantitative CT Scan of a Femoral head demonstrating its microarchitecture from a current study patient..

Prinicpal Investigator: Dr Joe Browne

Several studies in the department over the previous have shown that there is a large proportion of patients either attending the osteoporosis clinic or being admitted with fracture having vitamin D deficiency. Up to one third of patients have severe vitamin D deficiency and almost three-quarters have a level less than 50 nmol/L, the optimal level being 75nmol/L. Vitamin D in recent years has much interest in several areas outside bone health and may be associated with muscular weakness, falls, reduced cognition, mood disorders, increased risk of cancer (particularly breast and bowel cancer), and orthostatic hypotension. This year we plan to study the effect of vitamin D supplementation in the older person, focusing on bone health, falls reduction and improvement of blood pressure.

Fosavance 5600 Study

This study is being done in conjunction with Merck Sharp and Dohme and is examining the effect of alendronate and vitamin D3 on patients with vitamin D deficiency focusing on falls reduction and improvement of vitamin D levels.

Intervention of the Clinical Nurse Specialist in Hip Fracture Patients

Principal Investigator: Ms Niamh Maher

“Post Hip Fracture in Older Adults: Intervention 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. Ms Niamh Maher, has commenced her PhD which will be based on a study in optimising the management of hip fracture patients.

Patients are being assessed and advised with regards to osteoporosis in the nurse-led clinics, with particular emphases on falls prevention as 90% of our hip fracture population have sustained a fall at the time of fracture. Niamh’s study is on the value of clinical nurse specialist intervention in patients who are at risk of falls and the optimisation of treatment for these patients, assessing quality of life, improved mobility and compliance with medication.

Biomarkers in Osteoporosis

Principal Investigators: Ms Laura Corrigan and Dr Jackie Daly

The osteoporosis service has commenced an interesting study looking at the possibility of identifying proteins that vary between patients who have normal, osteopaenic and osteoporotic bones based on DXA. This pilot study has commenced in conjunction with Ms Laura Corrigan and Dr Jackie Daly in RCSI. It is expected that this study will continue recruiting patients for another 18 months and it is hoped that it will identify proteins and molecules that may aid in screening patients for osteoporosis in the future.

STRONGER Study

This study involves patients commenced on Strontium Ranelate therapy for the treatment of osteoporosis. It will review the outcome, quality of life, benefits and side effects of strontium in patients over 1 year.

Clinical Nurse Specialist (CNS) Research Projects

Ms Georgina Steen: completed an MSc in Gerontological Nursing in 2008.

The title of her dissertation is "Do patient's over the age of 65 years adhere with medications prescribed for their diagnosis of Osteoporosis".

Ms Nessa Fallon: completed an MSc in Gerontological Nursing in 2008. The title of her dissertation is "An Investigation into the Fear of Falling amongst Older People following a Colles Fracture".

Ms Niamh Maher: commenced a PhD. in Gerontological Nursing in 2007. The study concentrates on elderly people (those over 65 years) who have suffered a hip fracture and attended St. James's hospital for repair. It is a randomised controlled study. Hip fracture patients are assessed at three months by a Clinical Nurse Specialist and Physiotherapist for falls risk factors; nutritional status; mental status; place of residence; mobility and activities of daily living function this group is then compared with hip fracture patients who receive routine care. This study has been funded by the Health Research Board.

Ms Kara Fitzgerald: is currently studying for an MSc in Falls and Osteoporosis at the University Of Derby through distance education. She is in the second year of a 3-year programme.

Ms Sheila McCarthy: is working in conjunction with Ms Niamh Maher in the assessment of patients with hip fracture with the view of acquiring a MSc in Physiotherapy.

Awards

Dr Joe Browne, our Clinical Fellow in Bonehealth, received the Professor John S. Pritchard Medal for Clinical Tutor of the Year 2007 -2008. This prize is awarded by The Medical School to the "Teacher of the Year" selected by the final year medical students class.

Dr. Chie Wei Fan was awarded a Doctor of Medicine in November 2008 from TCD. Her thesis was entitled 'Sleeping with the Head of the Bed Tilted Up (SHU) — Physiology and Therapy'. The Thesis and was based on work that she had undertaken in the Falls and Blackout unit. Her Thesis was supervised by Dr Conal Cunningham.

The thesis focused on Orthostatic Hypotension (OH) and in particular "Sleeping Head Up" (SHU), a non-pharmacological treatment of orthostatic hypotension. The research projects included a postal survey of the use of SHU in current clinical practice, the

physiological responses of SHU in young controls, in older inpatient and an open-label randomised controlled trial of SHU in community-dwelling older patients with Orthostatic Hypotension. The research projects resulted in four peer-reviewed journal publications and the inpatient study won the presidential prize for best poster at the 56th Irish Gerontological Society Meeting.

Dublin Hospitals Group Risk Management Forum Falls Management Subcommittee

In February 2007 two clinical nurse specialists Kara Fitzgerald and Georgina Steen joined the Dublin Hospital Group Risk Management Forum.

The terms of reference are as follows:

1. To agree a common Falls Risk Assessment Tool and a procedure for the management of falls in accordance with:
 - Best professional practice in the area
 - Medico legal and regulatory compliance
 - Appropriate Professional Code of Conduct
2. To develop a policy framework from which member hospitals can develop local policies in conjunction with the above.
3. Membership is based on nominees from member hospitals who have appropriate expertise in the area of Geriatric medicine.
4. Consultation with other appropriate groups/ organisations as requires, subject to Forum approval.

Educational Activites

European Conference on Steroid Induced Osteoporosis – Dublin, November 2008

This conference was jointly organised by Prof J. Bernard Walsh and Dr. Fernando Marin. Clinicians with a special interest in Bone Health from all over Europe attended.

Irish Hip Fracture Prevention Meeting – November 2008

This meeting was organised by the Irish Society of Geriatric Medicine Bone Special Interest Group in liaison with the Irish Society of Orthopaedic Surgeons and the UK Hip Fracture Special Interest Group.

Dr. Miriam Casey and Prof J. Bernard Walsh both spoke at the meeting.

Conferences/Seminars at which Research & Clinical Projects were presented:

- Foundation, Flexibility and Freedom: optimising osteoporosis treatment using PTH Conference Lisbon, Portugal, February 2008.
- Syncope Conference, Clontarf, February 2008.
- Irish Gerontological Society (IGS) Annual Conference, Kilkenny, September 2008.
- Irish Osteoporosis Society Conference, Dublin, October 2008.
- Nursing Research Conference, Trinity College, Dublin November 2008.

- SPR Osteoporosis Special Interest Group (Alliance for Better Bone Health) February/July 2008.

In-house lectures:

Twice yearly Nursing Skills Fair
 Post-Graduate Diploma/MSc in Gerontological Nursing.
 FETAC Course for Health Care Attendants.
 Fall and Injury Prevention Lecture to BNS students.
 Ongoing education on Falls and Injury Prevention on MedEL wards.

External lectures:

Nursing Research Conference, Trinity College, Dublin, Nov.
 "Do patient's over the age of 65 years adhere to medications prescribed for their diagnosis of Osteoporosis". Georgina Steen

Nursing Research Conference, Trinity College, Dublin, Nov.
 "An Investigation into the Fear of Falling amongst Older People following a Colles Fracture". Nessa Fallon

Invited Lectures

Irish College of General Practitioners National Meeting Summer 2008 Tullamore
 Clinical Management of Osteoporosis: Dr MC Casey

ICGP National Trainees Meeting. Limerick Autumn Meeting Treatment of Severe Osteoporosis. 2008

Falls and Blackout Unit (FABU)

This is an out-patient assessment clinic that runs five days a week where patients with unexplained falls and blackouts are investigated using state of the art cardiovascular technology. The clinics are staffed by:

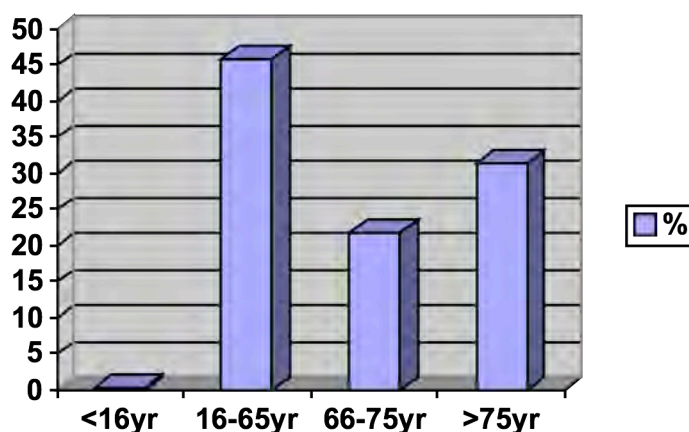
Two consultants Prof Rose Anne Kenny (Director) and Dr Conal Cunningham (Clinical Lecturer in Gerontology)
 6 Clinical research registrars
 2 Clinical registrars
 2 Clinical nurse specialists in falls & Blackout
 1 Specialist nurse overseeing clinical research,
 2 Administrative staff.

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

There has been an 18% increase in patient throughput in 2008 alone.

	New Patients	Return Patients	Total
2006	710	549	1259
2007	690	1178	1868
2008	710	1574	2284

Patients of all ages are assessed in the Falls and Blackout unit in 2008 with breakdown shown.



Stroke Service

The stroke service has continued to progress over the last year assessing and caring for over 400 inpatients and seeing over 1000 people in outpatients. Development of the stroke service has resulted in a reduction in mortality of one-third and a reduction in average length of stay of more than one week.

An intravenous thrombolysis service is now in place and the intraarterial service has been further developed. In addition we have introduced a nurse led secondary prevention service for cerebrovascular disease and run a daily neurovascular and Transient Cerebral Ischemic Attack (TIA) service. We have continued the development of our Acute Stroke Unit and have recently been pleased to receive a donation of €20000 from the Trinity College Med Day committee to provide specialist high dependency type electric beds and specialist seating for the unit.

The service continues its active research programme and recently has had a paper from our Post Stroke Fatigue study published in the *Quarterly Journal of Medicine (QJM)*. We have also had a study on the urgent assessment of stroke patients published in the *Irish Journal of Medical Science* and a number of further studies are being prepared for publication. We are progressing with our study of the neuroprotective effects of erythropoietin in cooperation with the department of Renal Medicine and have recently appointed a research nurse Ms Sally Couper to help run the study. Sally will be undertaking her MSc. based on this research.

We have submitted more than 20 original abstracts to national and international meetings in the course of the past year. Other continuing research projects include acute imaging of stroke patients, rehabilitation of strokes and hypotensive stroke.

Dr Harbison is coordinator of the new Diploma in Cerebrovascular and Stroke Medicine of the Royal College of Physicians of Ireland which commences in September 2009 and is on the development committee for national guidelines and standards of stroke care organised by the Stroke Council of the Irish Heart Foundation. These standards are being developed in conjunction with the Health Services Executive (HSE).

Cognitive Studies Clinic

The cognitive studies clinic is a clinical memory service that is operated by Research fellows and nurses involved in the Brain Ageing research programme of MIRA, under the supervision of Prof. B Lawlor, Dr. C Cunningham, and Prof. RA Kenny. The clinic has been designed and implemented as a “rapid access” memory screening service, where patients are accepted from multiple referral sources on a national basis. Patients following referral have a complete medical review, neuropsychological testing, and neuro-imaging as appropriate. There are 2 clinic sessions weekly on a Thursday and Friday morning. A minimum of 5 new patients are reviewed weekly, making in excess of 250 new diagnoses per annum. These patients are then referred on to the research projects where appropriate. There is close liaison with the MIRA memory clinic and all patients seen in both clinics are discussed at a joint consensus meeting

Roskamp Project

Anticipated completion date 28th February 2009

Aim of Study: To examine the effects of Nilvadipine in the treatment of mild moderate Alzheimer’s Disease

Subjects recruited: 86

The Roskamp project investigating the safety and efficacy of Nilvadipine, a dihydropyridine calcium channel antagonist, in the treatment of mild/moderate Alzheimer’s dementia is ongoing. The anticipated study termination date is the February 2009. To date 86 patients with mild/moderate AD have been recruited from the MIRA and Cognitive studies memory clinics. Patients have neuro-psychological testing, physical and neurological testing, cardiovascular testing (Ambulatory blood pressure monitoring and active stands), and biomarkers (Cerebrospinal fluid, Serum/Plasma) for the diagnosis of AD taken. Participants are also having non-invasive measurements of cerebral blood flow using transcranial dopplers. They are then treated with the trial medication or observed as a control. Results from the trial were recently presented at the European Neurology Society meeting in Nice, and the British Geriatrics Society meeting in the U.K. and the Irish Gerontological society.

Translational Research in Neurovascular Instability – HRB Project

Neurocardiovascular influences on Cognitive Functioning: Basic and Clinical Mechanisms

Study Duration: October 2006- October 2011

Research Team: Collins O, Dillon S, Rowan M, Lawlor BA, Kenny RA

This is a 5 year longitudinal study of older persons with Mild Cognitive Impairment (MCI) examining the influences of chronic and episodic hypotension on baseline cognition and on progression/transition to dementia over 3 years follow up. Subjects with MCI and age-matched controls are enrolled through the Cognitive Studies and the Memory clinics in St James’s hospital. Participants have annual neuropsychological assessments and neurocardiovascular assessments over 3 years. In addition, detailed neuro-imaging is performed at baseline and 3 years follow up. Blood and serum

biomarkers are also been analysed. In parallel, animal responses to cardiovascular and heart rate challenges are been examined in Trinity Institute of Neurosciences

Neurocardiovascular assessments include phasic blood pressure responses to active standing and carotid sinus stimulation, 24 hour ambulatory blood pressure and autonomic function tests (using heart rate variability and Ewing's battery). Neuropsychological testing includes a battery of standardized and validated measures to assess key cognitive domains including memory, attention and speed of processing. Neuroimaging is performed using magnetic resonance protocols including high resolution anatomical imaging for volumetric analysis, diffusion tensor and functional imaging.

We have enrolled 145 participants to date (100 MCI subjects and 45 controls). Cross-sectional results have shown significant levels of autonomic dysfunction, particularly in the parasympathetic system in MCI subjects compared with controls. These results have been presented at the Irish Gerontological and British Geriatric Society meetings in 2008.

Translational Research in Alzheimer's Disease – GSK Project

Differential Effects of Donepezil and Placebo on EEG/ERP Measures and Olfactory Discrimination in Mild Cognitive Impairment and Older Controls:

Overview:

This is a single centre study that is currently underway at the Mercers's Institute for Research in Ageing with collaboration from Trinity College Institute of Neuroscience and GSK pharmaceuticals. The objective of the study is to define the short-term effects of the existing Alzheimer's Disease (AD) symptomatic treatment compound donepezil on cognitive EEG/ERP endpoints and olfactory discrimination in normal elderly and amnesic mild cognitive impairment (aMCI) cohorts. To date the potential success of novel therapeutic agents for the symptomatic relief of AD has been largely unknown until the drugs enter relatively large-scale patient studies, assessing clinical outcome such as cognitive improvement over a certain time period. There is a need to enhance our ability to identify pharmacodynamic markers of drug activity to confirm central pharmacology and detect early signals of efficacy on cognitive processes and/or Alzheimer Disease associated symptoms. To provide an objective and perhaps faster measure for treatment efficacy, these pharmacodynamic markers also need to be more sensitive to drug effects than conventional clinical endpoints of cognition, such that they may be applied in early phase 2 studies with as few AD or MCI patients as possible. It is also necessary to identify characteristics of the subjects which are associated with pharmacodynamic effects. Such characteristics may then be applied to select subjects with cognitive impairment who may benefit from drug treatment in a clinical trial. To be in a position to optimally assess the efficacy of any future drugs designed to address the pathological hallmarks of AD, it is essential that we invest expertise and effort now to identify indicative mechanistic markers for exploitation in clinical trials.

Objective:

The purpose of the present trial is to carry out the first step in developing such markers in a population of amnesic MCI (aMCI), and in a normal elderly population, using novel Evoked Response Potentials (ERP) from the Electroencephalogram (EEG) and olfactory

identification deficits (including lack of awareness of them), as well as examining their responses to short term doses (over 4 weeks) of donepezil. These measures can then be used for the future assessment of potential novel treatments for AD. This study has a double blind randomised parallel group design. Twenty aMCI patients will be randomly allocated to two parallel groups. One group will receive placebo, and the second group will receive the active compound for 4 weeks. Cognitive EEG/ERP testing and a standardised smell test will occur pre- drug treatment and at various stages during treatment. There will be an identical design for 20 normal elderly control subjects.

Progress so far:

To date over 25% of the required number of patients have been recruited and are participating in the study, which is already underway. The recruitment process is ongoing via the memory clinic at St James's Hospital and local community and hospital services such as GP practises and Medicine for the Elderly clinics.

Medical Physics and Biomedical Engineering.

Measurement and Biophysics of Ocular Microtremor

Dr Niamh Collins and Mohammed al-Kalbani are continuing their research into ocular microtremor under the supervision of Prof Davis Coakley, Dept. of Medical Gerontology, TCD and Dr Gerard Boyle, Medical Physics and Bioengineering Department (MPBE), St James's Hospital. Ocular Microtremor (OMT) is a minute eye movement related to brainstem function with diagnostic and prognostic potential in brainstem disease.

The OMT research group received a significant boost in 2008, with a €128,000 Research Frontier grant awarded by Science Foundation Ireland (SFI) to Dr. Boyle as Principal Investigator. Research Frontiers grants are awarded by SFI to support “innovative, cutting-edge and internationally competitive” research. Ms. Emer Kenny, a graduate of Physical Sciences in Medicine at TCD has joined the group as a PhD student to undertake the developmental work in the proposal. She will investigate laser light scattering at the eye and how best to use this phenomenon to measure OMT clinically.

Research studies carried out in 2008 included the effect of alcohol and caffeine on ocular microtremor, the correlation between ocular microtremor activity and electroencephalography (EEG) in healthy subjects and clinical studies of OMT in patients with stroke, visual impairment and ocular motor disorders. All OMT measurements were carried out using technology designed and built at MIRA.

Mr Al-Kalbani and Dr. Niamh Collins undertook a three-week research placement in the laboratory of Professor Susana Martinez-Conde, a leading visual neuroscientist, in Phoenix, Arizona. Expertise and equipment in the Arizona lab are focused on rapid, intermittent flicks of the eye called ‘microsaccades’. A series of experiments were carried out to investigate relationships between microsaccades and OMT and to compare the performance of the Arizona and MIRA eye movement measurement systems. The project culminated in a novel investigation into ocular microtremor and visual perception.

Health Technology Research Activity at MIRA

Activity under this strand is designed to evaluate and adapt technology for health gain and clinical applications with older people. This work focuses engineering and clinical expertise on clinical problems. Following consultation on problems faced by the older person, a number of pilot projects were initiated, a sample of which is detailed below.

Suitable technology for these projects was designed, built or sourced through the MIRA Medical Physics lab.

A Simple Balance Assessment Tool for Clinicians and In-Home Balance Assessment

M. O Sullivan, C. Finucane, G. Boyle, Catherine Blake

Over the last few years MIRA, in collaboration with Physiotherapists in MedEl and UCD, has evaluated small, wearable electronic devices called ‘accelerometers’ for the clinical assessment of posture and gait. The resulting 20s clinical test has been shown to be a patient friendly alternative to the conventional 15 minute “Berg Balance” test. In 2008, the outcome of this project was more widely disseminated with conference presentations at the British Geriatrics Society (BGS) and other meetings and with the successful defence of a Master’s thesis in Physiotherapy. A journal paper is undergoing final review for publication in *Age and Ageing*. The work has now been extended to an investigation of the system’s potential in the home environment, through a larger scale study under the TRIL programme.

A Biofeedback System to Improve Gait in Older Adults with Parkinson’s disease

D. Phelan, C. Finucane, M. O Sullivan, G. Boyle

Parkinson’s disease often leads to decreased gait stability and an increased likelihood of falls. In collaboration with Physiotherapists from MedEl, we have shown that a periodic electronic auditory stimulus during walking can improve gait parameters in older Parkinson’s patients. In addition, we have shown that a simple wearable wireless accelerometer can detect gait abnormalities in Parkinson’s in an unobtrusive manner. This work was presented at a recent national Physiotherapy conference.

Gaming Biofeedback for Stroke Rehabilitation

S. Langford, C. Finucane, S. Ward

This project was conducted in collaboration with the Dept. of Physiotherapy, SJH with a view to investigating the usefulness of computer based weight distribution biofeedback for stroke rehabilitation in the elderly. The system consisted of a computer graphical display connected to a balance measuring device, giving a patient a simple visual indication of left/right balance. The system was found to be intuitive for both patient and therapist. The entire biofeedback group showed improved balance symmetry compared to an improvement of 60% of those not receiving biofeedback. Unfortunately this improvement was not shown to transfer directly to a functional improvement over a 6 week period, when measured by standard clinical scales. However qualitative evidence suggested otherwise, perhaps indicating a lack of sensitivity in the clinical scales employed. Lessons learned in this project have led to clinical use and evaluation of the Nintendo Wii Fit balance system in Hospital 2 for stroke rehabilitation.

Syncope and Falls

Ciarán Finucane is pursuing a PhD in MIRA, studying syncope and falls under the joint supervision of Professor Rose Anne Kenny, Dept. of Medical Gerontology, TCD and Dr Gerard Boyle, Medical Physics and Bioengineering, St James’s Hospital.

The theme of this research strand is the design and development of clinical tools and techniques for the investigation of NeuroCardiovascular Instabilities (NCVI’s) in the Falls and Blackout Unit (FABU).

One of our core research themes is technological innovation in Carotid Sinus Syndrome, a major contributor to syncope and unexplained falls in the elderly. Carotid sinus massage is currently the clinical tool of choice when diagnosing Carotid Sinus Syndrome. As an alternative to Carotid Sinus Massage (CSM) we have designed and implemented a non-invasive, digital signal processing technique for the diagnosis of Carotid Sinus Syndrome. This technique is standardized, safe and suitable for elderly patients. The technique builds on theoretical, mathematical models of the baroreflex developed at MIRA. This approach has undergone initial clinical trials in FABU. Findings were presented at local, national and international scientific conferences in 2008. Studies to improve the diagnostic potential of the technique have been completed in collaboration with Dr. Orla Collins and Dr. Clodagh O'Dwyer in the Falls and Blackout unit and a journal paper and thesis is in preparation.

In addition, three studies have been conducted in collaboration with Dr. M.P. Colgan, Veins Unit SJH to develop a sensitive and reliable carotid baroreceptor stimulator to improve carotid sinus massage. The system development element of this work is part supported by a Noel Hickey Bursary Grant from the Irish Heart Foundation.

In parallel we have continued to refine analysis tools and a technical framework for conducting pilot studies as part of the Technology Research for Independent Living (TRIL) Falls and Mu Sensory research strand. We have built a virtual tilting environment that allows us to mimic the perceived visual and auditory affects of tilt-table testing and their influence on autonomic function. This system has now been advanced from last year to include a Virtual reality headset, wireless EMG, ECG, respiratory monitoring and Galvanic Skin resistance and has been successfully tested in 20 healthy individuals – this is discussed in detail

Technology Research for Independent Living (TRIL)

TRIL is a virtual centre of expertise and research into **improving the health and happiness of older people**. TRIL is a collaborative effort combining Intel personnel and researchers from Irish universities and hospitals in multi-disciplinary teams. TRIL focuses on understanding and delivering on the support needs and preferences of older people at home and in care environments. TRIL's mission is to discover and deliver technology solutions which support independent ageing, ideally in a home environment. This will improve the quality of life of older citizens while reducing the burden on carers and on the healthcare system. TRIL is not a single project, but a centre of excellence, which will deliver a range of focused research projects by combining the skills and expertise of multi-disciplinary teams of scientists from the third-level sector, clinical specialists and industrial researchers. TRIL will initially engage with the leading Irish experts in a range of disciplines including

- social science,
- social interaction modelling,
- falls,
- cognitive performance decline,
- medical informatics and
- biomedical engineering.

The strands within the TRIL centre projects address the three key domains in ageing: **physical, cognition and social connectivity**. Further information on TRIL can be obtained from <http://www.trilcenter.org>

The TRIL clinic is based at the top of Hospital 4 in MIRA and started in August 2007. 482 persons aged 60 and over have undergone comprehensive assessments (physical/cognitive/psycho-social) - of those 378 were recruited in 2008.

The referral sources of TRIL clinic can be divided into community-based (77%) and hospital-based (23%). Of the 482 participants, 67% were women and 70% of them were self-referral. The sources of self-referred were recommendations of friends who had gone through the TRIL clinic, the active retirement groups and the Parkinson's Association of Ireland. Many responded from reading articles about TRIL. For instance, more than 40 older people volunteered to participate in TRIL research programme after reading the health feature in the Irish Times, which was written in association with the TRIL clinic launch in February 2008. The remaining participants were referred by their general practitioners, consultants in outpatients, falls clinics and the emergency department in St James's Hospital. Participants came from as far a field as Tralee, Galway, Co. Antrim, Kilkenny to Dublin, c.f. Fig. 1 for referral source of TRIL participants and Fig 2 for the trends of referral over the past 15 months. The emerging trend in TRIL cohort is self-referrals. This encouraging trend showed that older people in Ireland are keen to participate in research programmes.

Of the first 404 participants, 54.4% of them are defined as 'fallers', i.e. they have a history of falls or are at risk of falls. The mean age was 73.4 years and fallers were on average 5 years older than controls (75.6 years vs. 70.7 years). Feedback is provided to all participants after they completed the assessment and if necessary they are referred on to appropriate medical clinics and day hospital for further management.

On completion of the 600 recruits, the TRIL clinic will continue to assess older people to recruit them into three major home phases of the research programme where we employ TRIL developed technology to monitor, to provide feedback and to intervene to promote independence in older people. The clinical facility will be used as a setting to evaluate the outcome of the home deployment projects.

Impact of the Clinic on participants

The feedback from the participants following their experience in the clinic was extremely positive. This is reflected in a telephone survey of 50 random TRIL participants. More than 80% of them would definitely refer their friends and social network to the TRIL experience.

Significant events in TRIL calendar

- TRIL clinic launch: February 2008 by Minister for Older Persons, Ms Maire Hctor.
- One of the researchers in TRIL, Dr Roman Romero-Ortuno was awarded the best platform presentation in the Irish Gerontological Society Meeting in Kilkenny.
- TRIL clinic was recognised for its use of technology in health screening for older people and was awarded the first prize in the technology category in the Irish Healthcare Award in October 2008.

Figure 1. Referral source of the current TRIL cohort (n=482)

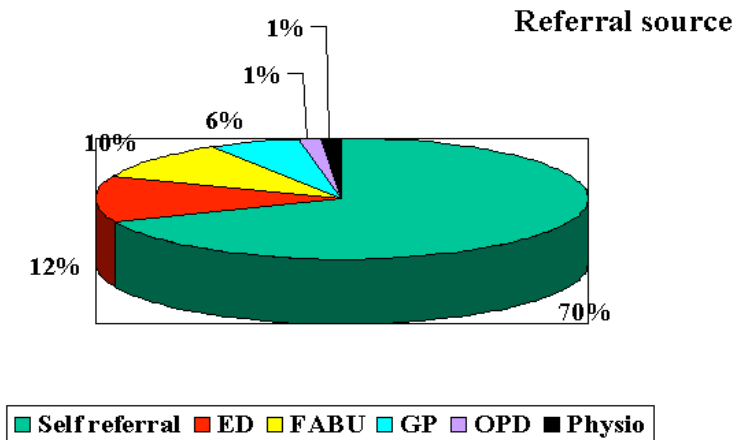
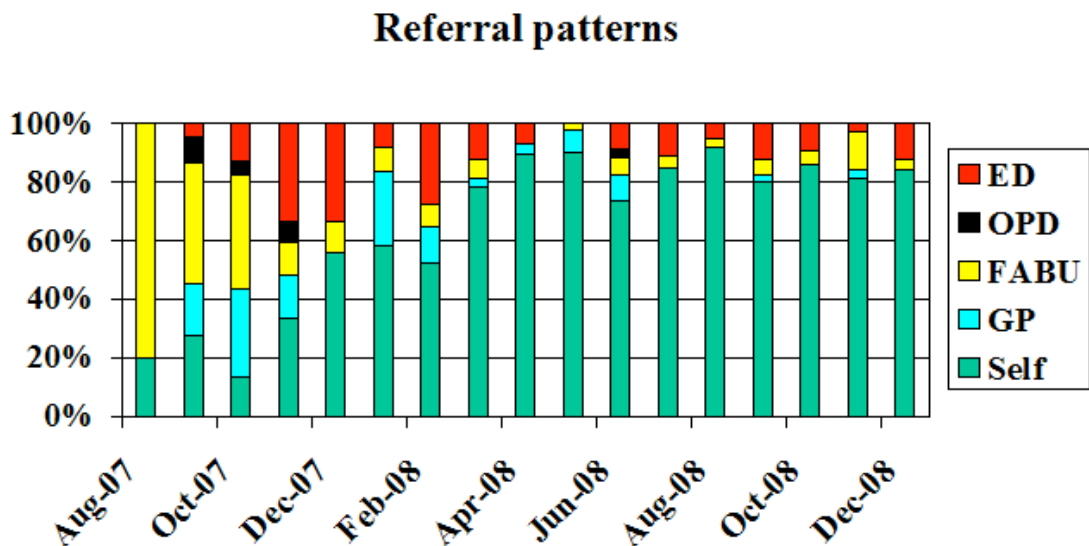


Figure 2. Referral trend from August 2007 to December 2009

ED = Emergency Department SJH
 FABU = Falls & blackout Unit, SJH



The Irish Longitudinal Study on Ageing: 2008 Review



Introduction

The Irish Longitudinal Study on Ageing (TILDA) is a major initiative led by Trinity College Dublin which will provide high quality research relating to older people and ageing in Ireland. It involves collecting baseline data and updates on a two yearly basis with a large cohort of people aged 50 and over and collecting detailed information on all aspects of their lives, including the economic dimension (pensions, employment, income

and assets, etc.), health aspects (physical, mental, service needs and usage, etc.) and social aspects (contact with friends and kin, formal and informal care, social participation. etc.). TILDA is funded by Atlantic Philanthropies and Irish Life.

TILDA Aims:

To develop an environment for ageing well we need to characterise the older Irish citizen and explore factors which determine successful ageing. This can only be done with the help of a nationally representative survey of the older population in Ireland that will act as the foundation on which appropriate health, medical, social and economic policies can be based. This study will provide a comprehensive and accurate picture of the characteristics, needs and contributions of older persons in Ireland that would be invaluable for:

- policy-makers & public sector service planners
- voluntary sector actors engaged in activities that seek to enhance the social integration of older citizens
- many private sector companies in the insurance and services industries

Furthermore the study will deliver quality cutting edge research consistent with the emerging national initiative towards a "knowledge society" built on innovations in science and technology.

The study is aimed at understanding the current status and changing needs of older people, in particular:

- Living standards, quality of life and pensions of people at older ages
- Physical and mental health needs of older people.
- Social care needs and social networks of older people
- Health and social needs of families and carers of older people
- Biological and environmental components of “successful ageing”
- Contributions that older people are making to society and the economy
- How each of these key components (health, wealth, happiness) interact such that we can ensure that Ireland meets the needs and choices of its citizens in a personalized and positive environment and with due dignity and respect
- What direction policies related to older people should take.

Project Description:

A nationally representative sample of 8,000 to 10,000 adults aged 50 and over, resident in Ireland, will be selected using a population sift. An initial multi-stage sample of addresses will be chosen by means of the RANSAM sampling procedure (Whelan 1979) developed by the Economic and Social Research Institute (ESRI). Each address will have an equal probability of selection. The goal is to pick addresses to represent the appropriate urban/rural mix as well as income, education, gender and geographical groupings.

The selected addresses will then be visited by a fieldworker and all persons aged 50 or over (and their spouses of any age) will be canvassed to participate in the survey. Fieldwork will involve interviews using computer-aided personal interviewing (CAPI) and either a visit by the respondent to a local TILDA Health Assessment Centre, where appropriate medical measurement facilities will be available, or a visit to the respondents' home by a qualified research nurse to take bio-medical samples. A self-completion questionnaire will also be administered to all respondents.

Participants selected for the main TILDA study will have a follow-up interview every two years and health assessment every four years for a ten year period.

Major developments in 2008

Given the innovative nature of the study, and especially the health assessment element, it was deemed necessary to carry out a number of pilots. Pilot 1 went into the field in July 2008. The key achievements of the pilot were as follows:

- Successfully designed and implemented training for the field staff and nursing staff.
- Successfully designed, programmed and administered the questionnaire in CAPI.
- Successfully designed and administered the self-completion questionnaire.
- Successfully set up the Health Assessment Centre under the auspices of Trinity College Dublin.
- Successfully designed and administered the health assessments.
- Informed the public about the project.
- Successfully designed and implemented standard operation procedures for collecting and using confidential data with the TILDA team and for all TILDA contractors.
- Evaluated sampling and contact procedures (response rate, cost, effectiveness).
- Tested the questionnaire, and its implementation in CAPI (length of time for each module and overall, item non-response, misrouting etc.).
- Developed and checked procedures in relation to linking of the elements (CAPI questionnaire, self-completion questionnaire, health assessment).
- Determined feasibility and cost of the health assessments in one local centre.

Pilot 1

TILDA Health Assessment Centre

In the first TILDA pilot, respondents completed a face-to-face interview and self completion questionnaire in their home, and were then invited to attend a dedicated centre in Trinity College Dublin for a health assessment. The assessments were scheduled at a date and time which suited the respondent, and were carried out by highly trained nurses. Transport was provided to and from the centre for those who wished to avail of it and the assessments took an average of 2½ hours each. Of the 142 Social Interviews conducted in the Pilot, 89 participants volunteered for the health assessment, although 10 of these could not be carried out before the close of the centre. Each of these participants received a copy of their test results and those that had given blood received the results within a few days of taking part. 100% of respondents rated the assessment as good or better. Overall the experience was very positive and the friendliness, organisation and approachability of the Health Assessment Centre team was absolutely key to its success.



The TILDA Health Assessment Centre, Trinity College Dublin.

Events in 2008

European Foundation Forward Look Workshop (November 15th 2008)

The Economic and Social Research Institute (ESRI) and The Irish Longitudinal Study on Ageing (TILDA) organised a workshop on 'Labour Market Implications of Demographic Ageing'. This event was organised in the context of the European Science Foundation 'Forward Look' on 'Ageing, Health and Pensions in Europe'. Forward Looks are activities sponsored by the European Science Foundation to enable Europe's scientific community, in interaction with policy makers, to develop medium to long-term views and analyses of future research developments with the aim of defining research agendas at national and European level. Prof. Brendan Whelan, Research Director of TILDA, is a member of the Scientific Committee of the Forward Look on 'Ageing, Health and Pensions in Europe'.

Health in Ageing Conference (May 29th & 30th 2008)

The TILDA Health in Ageing - Achievements and Potential of Longitudinal Research was truly an international, multidisciplinary and diverse meeting. It was held in association with Trinity College Dublin, Science Foundation Ireland and the Centre of Excellence for Successful Ageing, St James's Hospital. The two day programme covered a wide variety of interdisciplinary topics including cardiovascular health, cognitive health and mental health as well as identifying future directions within the field of ageing research. Professor David Snowdon, Professor of Neurology at the University of Kentucky and Principal Investigator on the Nun Study, presented our keynote lecture on 'Ageing with Grace'. Opening the conference, the Minister for Health and Children, Mary Harney said: "Solid reliable data helps put older people at the centre of health policy. There is an obvious need for high quality information to make sure that high quality services are based on evidence supported best practice."



"Health in Ageing Conference" 29th & 30th May 2008. From left to right: Mr. Ciaran Long, Irish Life; Prof. Brendan Whelan, TILDA; Minister for Health and Children, Mary Harney, TD; Prof. Rose Anne Kenny, TILDA; Mr. Gerry Loughry, Irish Life; Prof. Davis Coakley, TCD.



Minister for Health and Children, Mary Harney, during the opening of the “Health in Ageing Conference”.

The **T**rinity, University of **U**lster and **D**epartment of **A**griculture Study - **TUDA**

The TUDA study is a collaboration between Mercer's Institute, Trinity College Departments of Gerontology, Old Age Psychiatry and Biochemistry), University of Ulster and the Department of Agriculture in which a genotype and phenotype database of 6,000 subjects with certain diseases over 60 years will be collected. Four thousand subjects 2,000 with cognitive impairment and 2,000 with brittle bones will be recruited from out-patients attending the MedEL Directorate at St James's Hospital and two thousand subjects with hypertension will be recruited from GP practices in Northern Ireland between 2009-2011.

Detailed physical and cognitive assessments as well as biomarkers and genetic markers will be collected. Subjects attending the varied out-patient and day clinic services of the MedEl directorate will be offered assessment and the scale of the project is only possible due to the integration of research and clinical projects pioneered by the Mercer's Institute. We aim to investigate genetic, biochemical and clinical risk factors for these diseases. Once completed the database will represent a very important resource for further investigation of these diseases and will be one of the largest of its type in Ireland. It is hoped that information from this project will help identify genetic subtypes most likely to be affected by certain risk factors and ultimately help target treatments to those most likely to benefit from them.

Awards received in 2008

The Prof John S. Prichard Medal is awarded to the Best Clinical Tutor. Trinity College final year medical students are invited to nominate a recipient for this award from their various tutors, based on bedside tutorials, short and long mock cases and guidance on presentations and examination techniques. Dr. Joe Brown was voted Best Clinical Tutor for 2007 -2008.



Dr. Ion Cretu, Prof Shaun McCann with Dr. Joe Browne the 2008 recipient of the John S. Prichard Medal.

Clíodhna Ní Scanaill of Intel, Dr. Lisa Colgan and Dr. Roman Romero-Ortuno of the TRIL clinical team with Mr. Howard Beggs of Helix Health sponsors of the Irish Healthcare Awards.



The Technology Research for Independent Living (TRIL) Clinic won the Irish Healthcare Awards 2008 in the category of Best Use of Information Technology (Shelbourne Hotel, Dublin, 16 October 2008).

The Irish Gerontological Society Presidential Medals 2008 at the 56th Annual Scientific Meeting held in Kilkenny were awarded to Dr. Chie Wei Fan for best poster presentation and to Dr. Roman Romero-Ortuno for best platform presentation.

Partnerships

St. James's Hospital

Medicine for the Elderly
Psychiatry and Psychiatry for the Elderly
Clinical Biochemistry
Clinical Medicine
Haematology
Renal Medicine
Endocrinology
Histopathology
Dementia Services Information and Development Centre

Trinity College

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

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

RCSI

Department of Anatomy

St. Patrick's Hospital

UCD

Conway Institute
Department of Veterinary Medicine

Publications and Published Abstracts.

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Prospective Memory in Mild Cognitive Impairment. 2007

Irish Journal of Medical Science, Vol:75:3 Supp:2

Brewer, L., Cronin, H., Healy, M., Walsh, C., Kirby, C., Walsh, JB., Casey, MC.

The effect of chronic kidney disease on bone turnover and vertebral fracture risk. 2007

Irish Journal of Medical Science, Vol:75:3 Supp:2

Browne, JG., Thornton, E., Maher, N., Healy, M., McGovern, E., Casey, MC., Walsh, JB.

Hip Fracture Patients with Vertebral Fractures have more Severe Osteoporosis and are Candidates for more Active Treatment including PTH.

American Society for Bone and Mineral Research, Montreal, September 2008.

JBMR: Vol:23, September 2008 pp. S309: SU274

Browne, JG., Brennan, B., Healy, M., Maher, N., Casey, MC., Walsh, JB.

Vitamin D Deficiency in Highly Prevalent in Irish Hip Fracture Patients.

American Society for Bone and Mineral Research, Montreal, September 2008

JBMR: Vol:23, September 2008 pp. S446: M294

Browne, JG., Healy, M., Casey, MC., Walsh, JB

Irish hip fracture patients have a high prevalence of secondary hyperparathyroidism with increased bone turnover - a silent epidemic?

56th Annual Scientific Meeting of the Irish Gerontological Society, Kilkenny, October 2008

Irish Journal of Medical Science (2008) 177 (Suppl. 9): S309

Browne, JG., Thornton, E., Casey, MC., Walsh, JB.

Lateral Vertebral Assessment of Patients with Hip Fracture - an additional fracture risk assessment tool?

56th Annual Scientific Meeting of the Irish Gerontological Society, Kilkenny, October 2008

Irish Journal of Medical Science (2008) 177 (Suppl. 9): S342

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Outcomes of hip fracture patients in a large Dublin teaching hospital

56th Annual Scientific Meeting of the Irish Gerontological Society, Kilkenny, October 2008.

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