

Mercer's Institute for Research on Ageing



Annual Report 2006



Index

<i>Section</i>	<i>Pages</i>
<i>MIRA Personnel</i>	2 - 4
<i>Synopsis of the Annual Report</i>	5 - 8
<i>The Memory Clinic</i>	9 - 16
<i>Stroke, Research and Clinical Services</i>	17
<i>Falls, Blackout, Bone Protection and Osteoporosis Unit</i>	18 - 27
<i>TRIL – Technology Research for Independent Living</i>	28
<i>TILDA – <u>The Irish Longitudinal Study on Ageing</u></i>	29 - 32
<i>HRB Translational Research Award 2006</i>	33 - 34
<i>Roskamp Study</i>	35 - 36
<i>Medical Physics and Bio- Engineering</i>	37 - 39
<i>Donation of Computers & IT Equipment to Tanzania</i>	39
<i>Partnership</i>	40
<i>Publications</i>	41 - 44

MIRA Personnel

Steering Committee Members

Professor Davis Coakley (Chairman)
Professor J. Bernard Walsh
Professor Brian Lawlor
Dr. Conal Cunningham
Professor Jim Malone
Mr. Desmond Dempsey
Dr. Miriam Casey
Professor Rose Anne Kenny
Dr. Joseph Harbison

Director

Professor J. Bernard Walsh

Consultants

Professor Davis Coakley
Professor Brian A. Lawlor
Professor Rose Anne Kenny
Dr. Conal Cunningham
Dr. Miriam Casey
Dr. Joseph Harbison

Administrator

Ms Carol Murphy

Watt's Clinical Research Fellow

Dr. David Robinson

Lecturers / Research Fellows

Dr. Hilary Cronin
Dr. Sean Kennelly
Dr. Orla Collins

Falls and Osteoporosis Unit

Dr. M. C. W. Fan
Dr. Tara Coughlan

Memory Clinic Research Fellows

Dr. Conor O'Luanaigh
Dr. Dervila Hennelly
Dr Niamh Collins

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

Medical Statistician

Dr. Cathal D. Walsh

Secretary

Ms. Rachael Farley

IT Consultant and Technology Adviser

Mr. Vincent Quinn

Falls and Osteoporosis Unit Nursing Personnel

Ms. Niamh Maher

Ms. Nessa Fallon

Ms. Georgina Steen

Ms. Kara Fitzgerald

Ms. Dympna Hade

Ms. Lisa Byrne

Radiographer

Ms. Eilish Thornton

Physicist

Mr. M. Al-Kalbani

Mr. C. Finucane

Secretaries

Ms. Deirdre Cummins

Ms. Martina Quinn

Ms. Martha Gavin

Ms. Heather Bailey

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. E. Greene
Dr. M. Kirby
Dr. H. Lee
Dr. A. Lynch
Dr. C. Maguire
Dr. M. Moran
Dr. R. Mulcahy
Dr. S. Ni Bhrian
Dr. H. O'Connell
Dr. D. O'Mahony
Dr. G. Swanwick

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

Biomedical Engineer:

Dr. Gerard Boyle

Synopsis of the Annual Report 2006

New Consultant Appointments

The Mercer's Institute for Research on Ageing saw further major changes in 2006 with the appointment of two extra Consultants to St. James's Hospital - Dr. Joseph Harbison, Senior Lecturer in Medical Gerontology with a special interest in stroke and Dr. Elaine Greene, Consultant Psychiatrist who will join with Professor Lawlor in the Psychiatry of the Elderly team.

Centre for Successful Ageing

The planning for the new Centre of Successful Ageing gained further momentum with a firm commitment by Atlantic Philanthropies to financially support the project. Ongoing planning meetings took place on a regular basis in 2006 with the Department of Health and the Health Service Executive.

The development of the New Centre for successful Ageing within St. James's Hospital has now been prioritised by the Department of Health and Children, the Health Services Executive (HSE) and Atlantic Philanthropies and we look forward to significant progress on the capital development in 2007.

The centre will house a completely new building for the Mercer's Institute for Research on Ageing and this will incorporate the research and teaching pillars of the new development. The New Centre will also include extensive ambulatory clinical facilities which will provide a comprehensive diagnostic and treatment programme for elderly patients in the community. New wards which will provide modern inpatient facilities will be built to replace the admission and rehabilitation facilities in the older buildings of Hospital 2 and Hospital 4. Also included will be an acute stroke treatment unit and a best practice continuing care facility for highly dependent elderly patients.

Major New Developments in 2006 were as follows:

1. The launch of a key longitudinal study on ageing in the elderly in Ireland (TILDA Study). This is a very important development both nationally and internationally and has received major significant funding from Irish Life and Permanent Insurance, The Department of Health and Atlantic Philanthropies. Professor Rose Anne Kenny is the main driving force and principal investigator in this study.
2. The awarding of a major IDA and Intel Grant for Technology Research and Independent Living in the community based elderly (TRIL). This is another key development and the Mercers Institute has been identified as a major centre in Ireland for a new international division of technology in clinical research by Intel and the IDA.
3. The launch of the Roskamp study of patients with Alzheimer's disease. This study will be carried out in close collaboration with the Roskamp Institute in Florida and will study the effects of calcium channel blocking agents in patients with mild to moderate Alzheimer's disease.

4. The granting of a Health Research Board (HRB) Translational Research Award for research on Neurocardiovascular influences on cognitive functioning. This study will look at 400 subjects with mild cognitive impairment and a 150 controls over a three year period and will investigate the current poorly understood factors which underpin the conversion from mild cognitive impairment to dementia which occurs in many patients with mild cognitive impairment.

The main areas of Clinical Research are as follows:

1. **Memory**
2. **Falls, Blackout, Bone Protection and Osteoporosis**
3. **Medical Physics & Bio-Engineering**
4. **Stroke**

Memory Clinic

The Memory Clinic in the Mercer's Institute for Research on Ageing was established in 1991 with the help of a grant from the Irish Health Research Board to assess memory disorders in older people. It was the first memory clinic in the Republic of Ireland and has acquired considerable expertise in assessing and diagnosing cognitive disorders.

In the past 12 months 308 individuals were assessed. This included 168 new patients and 140 return patients. The majority of referrals were from St James's hospital, with the remainder referred by hospital consultants and general practitioners throughout the 26 counties. The return patients consist mainly of clients with Mild Cognitive Impairment who are being monitored for progression to dementia or clients where the diagnosis is unclear.

Over the past twelve months referrals to the memory clinic have become increasingly challenging and complex with early cognitive deficits resulting in greater demands on time and personnel. Each new referral is now seen in the memory clinic on two separate occasions:- initially for assessment and subsequently for feedback and intervention where indicated.

Intervention Clinics, Family meetings and Feedbacks sessions continue to be a central part of the Memory Clinic and these are described in more detail in the main section of the report below.

The major research projects undertaken in the Memory Clinic are detailed within the Memory section of the document and these include The Dublin Healthy Ageing Study, The Impact of social factors on health and quality of life, Concordance between cognitive tests and demographic effects in an Irish population and Development of novel measures of autobiographical memory.

Falls, Blackout, Bone Protection and Osteoporosis Unit

Both the Falls and the Osteoporosis sections of this unit have both continued to expand their services and research areas over the past year. The Falls area saw significant expansion with the appointment of new clinical nurse specialists and the transfer from Hospital 4 of the Falls and Blackout clinical diagnostic facility to a new unit in the Main Hospital next door to the Accident & Emergency Department. This new facility was officially launched by the Minister for Health and Children Ms. Mary Harney and the unit was renamed the Falls and Blackout Unit (FABU).

The Falls and Blackout Unit provides a rapid expert dedicated assessment and treatment to falls, dizziness and blackouts to patients presenting with these symptoms. This unit delivers a 'One Site – One Stop' rapid access day-case service to patients from the emergency department (Emergency Department Liaison Initiative and Integrated Care Plan), general practitioners or consultants from all over the country. In most cases all investigations, diagnosis and treatment can take place during the patient's first visit.

An in-patient Falls and injury prevention Programme is run by an expanded clinical nurse specialist team. The strategy for falls prevention includes the development of Integrated Care Plans, detailed collection of faller information on dedicated databases, on-going staff training in fall prevention and a regular in-patient audit programme looking at the effectiveness of our service using certain key quality of care indicators (fall risk stratification of patients, hip protector compliance and fallers identification alert).

As a result of the first three years of the in-patient falls prevention programme, falls documentation has risen from 61% to 100%. There is an increase in compliance with falls prevention measures (33% to 86%) and reduction in recurrent in-patient falls (62% reduction). Injurious falls were also reduced by 20%.

In the area of Bone Protection and Osteoporosis in 2006 we saw further expansion and increase in demands for all aspects of the service and increasing clinical and research links with other departments e.g. Nephrology, Haematology and Rheumatology and with clinicians dealing with patients with inflammatory bowel and respiratory diseases.

Dedicated hip fracture assessment clinics have now been developed in addition to the existing Colles Fracture and general osteoporosis pre-assessment clinics. All new patients who had fractures were comprehensively assessed with DXA, bone markers and osteoporosis risk assessment questionnaires and were subsequently reviewed in a specialised consultant led bone clinic which has become a central part of the bone clinical service and research branch of the unit.

Over 140 severely osteoporotic elderly subjects have now embarked on treatment with recombinant Parathyroid Hormone Therapy (PTH). This relatively new treatment will reduce their chance of having a subsequent severe vertebral fracture by 90%. Impressive improvements in quality of life have been noted and patients regularly relinquish the need for lumbar support corsets, reporting improvements in flexibility of their spines and general mobility.

Despite the advanced years of our population 300-400% increases in the rate of biochemical bone formation following PTH have been noted in patients up to 92 years of age!!

Two national courses were organised in St. James's Hospital for staff working in the area of clinical Densitometry (DXA) from Hospitals and Community Units throughout Ireland in October 2006. One of these courses included members of a working international advisory group drawn from different European countries.

Medical Physics & Bio-Engineering

The potential for technology to help improve the quality of life of the older person and their carers is an expanding area internationally and technology has reached a point where unobtrusive, user friendly and useful 'assistive technologies' can be practically implemented. The Medical Physics & Bio-engineering Unit in MIRA have focussed on building a process to develop, test and deploy assistive technologies which are of genuine benefit to the end user. These projects are discussed in detailed in the main section below include a Night Lamp, a Locator device and Exercise feedback sensors.

Eye Tremor Research is a major section within the unit and the eye tremor measurement system which was originally designed at MIRA has now been redesigned and rebuilt at the MIRA engineering lab and has gone into use as a research tool. The device allows the investigation of OMT (Ocular Microtremor), a very rapid eye movement that carries diagnostic and prognostic information on brain function. The device redesign brings the system up to date with current electronic and signal processing techniques.

An optical system is also being developed and close cooperation is taking place with engineering colleagues in UCD. The technical programme of OMT measurement system design is integrated with a programme of clinical investigation.

A special study on ocular microtremor in brain lesions, neurodegenerative disease, altered arousal states and visual dysfunction is described below in the Memory Clinic section.

Stroke

The further development of stroke services and stroke research has taken a significant step forward with the appointment of our new senior lecturer and consultant Dr. Joe Harbison and a new Thrombolysis protocol has been established in conjunction with Accident and Emergency to permit the administration of "clot-busting" drugs to patients admitted with ischaemic stroke within three hours of stroke onset. The development of a dedicated acute in-patient stroke unit into which all new patients will be admitted is a priority development for the hospital and a new Neurovascular clinic has been established which will permit a rapid review of patients with mini strokes and transient cerebral ischaemic attacks (TIA's). These new services will also facilitate the in depth study and management of patients with stroke and neurovascular disease.

The Memory Clinic

Introduction

Facilities for in depth cognitive assessment have become increasingly important as the population in Ireland ages. The Memory Clinic in the Mercer's Institute for Research on Ageing was established in 1991 with the help of a grant from the Irish Health Research Board to assess memory disorders in older people. It was the first memory clinic to be established in the Republic of Ireland and has acquired considerable expertise in assessing and diagnosing cognitive disorders. It remains an essential part of the Department of Medicine for the Elderly and Old Age Psychiatry at St. James's Hospital, complementing the services of these departments in providing a diagnostic and therapeutic approach to people with cognitive problems. This clinic assesses patients with a variety of diagnoses including Alzheimer's Disease, Vascular Dementia, Dementia of Lewy Bodies and Frontal-temporal Dementia. There are a number of components to the Memory Clinic including Patient Assessment sessions, Intervention Clinics, Family Meetings, and Feed-back Meetings. 14 slots are available on average for general assessments per week. These sessions are currently run by a multi-disciplinary team including nurses, doctors, a psychologist and social worker.

The aims of the Memory Clinic are:

- a) to establish a diagnosis in patients with memory problems.
- b) to provide information and support to patients and their family members.
- c) to initiate appropriate treatment in patients with an established diagnosis of dementia.
- d) to monitor progression of patients who are likely to progress to dementia.
- e) to provide patients and families with information regarding research projects in the area of cognitive disorders.

Patient Assessment

Since its inception, over 3,300 patient assessments have been carried out at the Memory clinic. In the past 12 months 308 individuals were assessed. This included 168 new patients and 140 return patients. The majority of referrals were from St James's hospital, with the remainder referred by hospital consultants and general practitioners throughout the 26 counties. The return patients consist mainly of clients with Mild Cognitive Impairment who are being monitored for progression to dementia, or clients where the diagnosis is unclear.

Over the past twelve months referrals to the memory clinic have become increasingly challenging and complex with early cognitive deficits resulting in greater demands on time and personnel. Each new referral is now seen in the memory clinic on two separate occasions: initially for assessment and subsequently for feedback and intervention where indicated.

This allows for more time for psychosocial support and access to information for patients and their families. Prior to assessment a questionnaire is sent to the patient and is completed by a family member or somebody well known to the patient. This questionnaire is then returned to the clinic by post, providing valuable information before the patient attends. This allows the team to tailor the assessment to the patient's specific needs.

A comprehensive collateral history, medical assessment, nursing assessment and in-depth neuropsychological testing are carried out at each initial visit, taking approximately 2 1/2 hours. Further haematological, cardiovascular or radiological investigations are organised if required. Each case is then discussed in detail at a weekly consensus meeting and a treatment plan instigated, which includes therapeutic options, management of secondary risk factors as well as control of psychiatric and behavioural disturbances. New patients requiring treatment with acetylcholinesterase inhibitors are seen at the intervention clinic. Family meetings and feedback sessions are also offered on a regular basis when appropriate.

The majority of return patients are reviewed on an annual basis. Six-monthly assessments are carried out where necessary. The aim of each return assessment is to monitor the rate of progression, to evaluate and manage risk factors as well as to identify and rectify complications including behavioural disturbances in order to minimise the carer burden.

A comprehensive medical and nursing assessment, collateral history and repeat neuropsychological testing are usually carried out at each follow-up visit. In addition to the above, neuropsychological assessments are carried out on patients referred from other memory units throughout country who had previously had a medical workup. This is to facilitate units with no expertise in Neuropsychological testing.

Intervention Clinic

For those patients commencing acetylcholinesterase inhibitors, this clinic provides an opportunity to discuss treatment goals and other aspects of therapy such as dose escalation and side effects. Each visit is also attended by a social worker in order to provide further information on available social supports. Approximately an hour and a half is allocated per patient to discuss relevant issues. Further time or another appointment is provided if required. Unless further issues are identified, patients are discharged to appropriate follow-up.

Family Meetings/Feedback sessions

All new patients are now offered a feedback session to disclose diagnosis and offer appropriate support. With the patient's permission, diagnosis and prognosis are discussed and explained fully to patient and family. Practical advice is given on management of problems which could arise as well as information on support services. Legal aspects such as enduring power of attorney are also explained. A handbook is made available to families requiring further information. Each meeting is chaired by a doctor with a medical social worker in attendance.

Research

The Memory clinic continues to be active in various research projects including collaborations with other departments and institutions. Formal administrative and research meetings are held monthly. The memory clinic continues to have close links with both the Medicine for the Elderly and Psychiatric Departments of St. James's Hospital, Dublin and the Adelaide and Meath Hospital, Tallaght as well as St. Patrick's Hospital Dublin.

Ongoing/Completed Memory Clinic Research Projects

The Dublin Healthy Ageing Study.

Genetic influences on cognitive ageing and cognitive decline.

The Impact of social factors on health and quality of life.

Agitation and constant observation in elderly patients in a general hospital.

Prevalence of Fear of falling and effect of combined interventions for falls on fear of falling in a group of fallers attending out patient services.

Ocular microtremor in brain lesions, neurodegenerative disease, altered arousal states and visual dysfunction.

Development of a novel measure of autobiographical memory.

Prospective and retrospective memory in Mild Cognitive Impairment and Vascular Cognitive Impairment.

Concordance between cognitive tests and demographic effects in an Irish population. Post-stroke outcomes in the community.

Awareness in Traumatic Brain Injury and Frontotemporal dementia.

The Irish Longitudinal Study of Ageing (TILDA).

Neurobiological Determinants of depression in Chronic Obstructive Pulmonary Disease (COPD).

The subjective experiences of new patients and their primary caregivers attending a national memory clinic.

The Dublin Healthy Ageing Study

Overview

The elderly are the fastest growing population subgroup in the developed world. An estimated 20% of the population will be over 65 years of age in Ireland by the year 2025. It is increasingly important therefore to identify factors that will help the elderly stay healthy and independent as they grow older, in order to ensure not just longevity but also a satisfactory quality of life.

The Dublin Healthy Ageing Study project is a large population based study investigating the physical, psychological, social as well as cognitive correlates of health in older Irish people living in the community using a comprehensive battery of physical, social, psychological, biological and cognitive measures.

The second wave of the Dublin Healthy Ageing Study commenced in August 2006. In addition to factors examined in the first wave of the study, this phase has seen the introduction of two important aspects:

- a) Genetic influences on cognitive ageing and cognitive decline in older people
- b) A more comprehensive focus on the impact of social factors on the cognitive and physical health and quality of life of the elderly, with the introduction of several new social measures, which include social network, social resources, social engagement, social intimacy and loneliness.

Genetic influences on cognitive ageing and cognitive decline

Cognitive function is a key factor in the quality of life of older people and cognitive decline is a strong predictor of poor survival. Adaptive cognitive functioning will be a key factor in facilitating independent living by this aged population. It is likely that part of the individual variability in cognitive ageing and cognitive decline is under genetic influence. Many genes are posited to affect learning, memory and neurodegenerative diseases. Which genes, and how they might influence ageing and cognitive decline, either directly or indirectly through their association with specific illnesses such as cardiovascular disease, is unclear, and at present, little is known about protective and risk factors for cognitive ageing in the Irish population.

The impact of social factors on health and quality of life – Progress so far

To date, the DHAS has assessed 68 participants, since August 2006. Approximately 51% of participants contacted thus far have agreed to participation. With the current rate of participation, the second wave of the DHAS can expect to recruit approximately 238 participants from the 466 who were originally assessed in the first wave of the DHAS. Currently, it is estimated that data collection for the second phase will be completed in September/October 2007.

Erin Tehee is responsible for the coordination and recruitment for the Dublin Healthy Ageing Study, in addition to the administration of neuropsychological tests during participant assessments. Erin has recently submitted a paper for review to the International Journal of Geriatric Psychiatry, entitled “Conducting research in elderly community dwelling populations: Methodological challenges”. The paper seeks to characterize methodological difficulties encountered in conducting community-based research with elderly populations, based on our researchers’ experience and a selective review of the literature in this area. By characterizing such difficulties and offering evidence-based strategies to overcome them, the paper aims to provide guidance and enhance quality and participation rates for future research.

David Robinson was appointed as the first Watts Clinical Research Fellow to assist in completion of the DHAS. He is examining cross-sectional and longitudinal correlations between vitamin B12 and cognition and other factors in the DHAS cohort. This will be compared against other clinical groupings attending the Memory Clinic as the first part of an MD.

Conor O’Luanaigh is a research fellow and honorary lecturer in old age psychiatry. Currently along with David and Erin he is involved in data collection for the DHAS-2. He is focusing on social factors that are related to both mental and physical health. In particular he is interested in how loneliness impacts on health and its relation with social networks. He is also interested in whether personality type alters/changes

longitudinally with cognitive impairment. He is currently writing a review article on loneliness as a risk factor for depression. These projects will form the basis of an MD.

Agitation and constant observation practices in a general hospital population

Dervila Hennelly is a research fellow and lecturer in Old Age Psychiatry. She has been involved in setting up and clinically supporting a CNS post in Liaison Old Age Psychiatry in the general hospital. This is designed to assess and treat elderly patients with agitation who require constant observation. She is writing a review article on managing dementia in the general hospital. She has collected data looking at constant observation practices in this St. James hospital and will be writing this up along with a comparison between these patients and agitated patients who do not require constant observation.

Fear of Falling

Dervila Hennelly has very recently obtained ethical approval to study prevalence of fear of falling in a cohort of outpatient fallers over 65yrs attending services at St. James Hospital and to ascertain the effects of combined falls interventions on their fear of falling.

Ocular microtremor in brain lesions, neurodegenerative disease, altered arousal states and visual dysfunction

Niamh Collins is a PhD student with an interest in ophthalmology and visual science, and is currently investigating ocular microtremor (OMT). This is a high frequency tremor of the eyes, present in all normal subjects even when the eyes are apparently at rest.

OMT is of neurologic origin with demonstrated potential as a diagnostic aid in brain disease, but by nature of its minute size, is a considerable challenge to record accurately. In conjunction with researchers in the MIRA engineering lab, a device to measure OMT is currently in operation. Initial exploration and refinement studies using this equipment to measure OMT in 10 normal volunteers were completed in 2006. Formal pilot testing of the reliability of the measurement system in 20 volunteers under various conditions is in progress, with promising preliminary results.

The planned program of clinical investigation of OMT consists of three main strands:

Strand 1 – Structural pathways: OMT and Anatomical brain lesions

A study of the effect of lesions in targeted brain areas on OMT has been developed in collaboration with Dr. James Meaney of the department of radiology. MRI-brain reports for June-December 2006 have been reviewed, and patients with lesions in defined areas identified as potential study subjects. A daily log of MRI-brain reports has also been set up to allow ongoing capture of potential study subjects while inpatients.

The first OMT recording in a patient with a brainstem lesion using the new iteration of OMT measurement device was successfully undertaken in January 2007. The potential for OMT to aid in the differential diagnosis of Parkinson's Disease and Progressive Supranuclear Palsy will also be examined in 2007.

Strand 2 – Central physiological processes: OMT and Arousal/Attention

Level of arousal is known to affect OMT frequency. The effect of sleep deprivation on OMT is under investigation, including correlation with other measures of arousal and attention. Initial OMT recordings in sleep-deprived doctors (after a night shift in hospital) have been made, and recruitment for this study is underway. Furthermore, the effect of simple experimental measures, which alter arousal, on OMT will be assessed.

Strand 3 – Peripheral inputs: OMT and Visual function

The relationship between visual acuity and OMT is not known. The pilot study incorporates formal assessment by an ophthalmologist of visual acuity, contrast sensitivity and intraocular pressure, to examine for an effect of visual and ocular parameters on OMT. Further studies will examine OMT in states of visual dysfunction, including Age-related Macular Degeneration, optic neuritis and amblyopia.

The current OMT research project builds on the considerable multidisciplinary expertise in this area within MIRA and continues in the valuable tradition of medical physics engineers working closely with clinicians.

Development of a novel measure of autobiographical memory

Muireann Irish is pursuing a PhD in MIRA, registered under Prof. Brian Lawlor, Dept. of Psychiatry, TCD, with joint supervision from Dr. Robert Coen and Dr. Shane O'Meara, TCIN. A novel measure was developed based on recent conceptual refinements, for which most existing measures are inadequate.

The validation study comparing healthy young and healthy elderly individuals and individuals with mild Alzheimer's disease is nearing completion.

A second study investigating autobiographical memory and its neuropsychological correlates is Mild Cognitive Impairment (MCI) is currently progressing well with data collection past the half-way mark. Findings from both studies have been presented at national and international Scientific Meetings, including Cognitive Neuroscience Society Annual Meeting (San Francisco, April 2006), Irish Gerontological Society Annual Meeting, (Galway, September 2006), Neuroscience Ireland Inaugural Meeting (Cork, September 2006), European Societies of Neuropsychology Annual Meeting (Toulouse, October 2006) and Psychological Society of Ireland Annual Meeting (Galway, November 2006).

Prospective and retrospective memory in Mild Cognitive Impairment and Vascular Cognitive Impairment

Alberto Blanco completed this study which he submitted for his research Thesis in part fulfilment for a Doctorate in Clinical Psychology, UCD (joint supervision: Dr. Teresa Burke, Psychology Dept., UCD and Robert Coen). He was awarded a distinction and has now qualified as a Basic Grade Clinical Psychologist. Findings have been presented at the Irish Gerontological Society Annual Meeting, (Galway, September 2006) and Psychological Society of Ireland Annual Meeting (Galway, November 2006). The work has been submitted for publication.

Tauopathy study of Frontotemporal Dementia, Corticobasal Degeneration, and Progressive Supranuclear Palsy

Robert Coen worked in collaboration with Prof. Ian Robertson, TCIN, Dr. Tim Lynch, Mater Hospital and colleagues on a study to evaluate genotype-phenotype differentiation among different tauopathies. Data collection was completed in 2005 and part of the work was submitted as part of Fiadhnaid O'Keefe's PhD thesis, which she was subsequently awarded. Findings were presented at the Psychological Society of Ireland Annual Meeting (Galway, November 2006). A paper on insight in FTD, CBD and PSP is in press.

Concordance between cognitive tests and demographic effects in an Irish population

Sharon O'Sullivan is nearing completion of this research which will be submitted as her research Thesis in part fulfilment for a Doctorate in Clinical Psychology, TCD (joint supervision: Robert Coen and Dr. Hugh Garavan, Psychology Dept., UCD). The work entailed data extraction and quantitative / qualitative analysis of demographic and cognitive data from both our Memory Clinic Database and AGECAAT community database. Data collection is completed and the work is at the write-up stage.

Post-stroke outcomes in the community

Robert Coen has collaborated with Dr. Conal Cunningham and Dr. Francis Horgan in undertaking a study investigating Post-stroke outcomes in the community. Claire Tobin, a Final Year Psychology Undergraduate has almost completed data collection and will submit findings from the study for her Final Year Research Thesis in addition to assisting in producing a report for the Voluntary Stroke Scheme (VSS) by whom the research was sponsored.

Awareness in Traumatic Brain Injury and Frontotemporal dementia

Robert Coen was a co-applicant with 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 TBI and FTD – HRB Partnership grant has now been obtained, Recruitment commencing by March 2007.

Memory Clinic involvement in the Irish Longitudinal Study of Ageing (TILDA)

Robert Coen is on the Cognition and Psychological Health Work Group (in conjunction with Prof. Roseanne Kenny, 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.

Neurobiological Determinants of depression in Chronic Obstructive Pulmonary Disease (COPD)

Data collection for this study investigating neurobiological determinants of depression in COPD is ongoing. Subjects are recruited from COPD outpatient clinics. These subjects are screened for depression and undergo a brief cognitive assessment as well as a semistructured psychiatric interview. Forty subjects have been recruited for far, with data collected on demographics, co-morbid illnesses and spirometry. Patients have been screened for depression and cognitive function has been assessed. This study is a collaborative study between the memory clinic and the respiratory and psychiatry teams.

Blood samples are also being collected from patients for later batch analysis to measure cytokine levels (IL-6 and TNF-alpha) to determine if these neurobiological factors increase the vulnerability of patients with COPD to depression.

The subjective experiences of new patients and their primary caregivers attending a national memory clinic

Matthew Gibb is assessing the experience of patients and caregivers who are seen in the Memory clinic. This has been submitted for publication and is currently under review. He has developed information leaflets for patients and caregivers in the areas of dementia and driving, and dementia and employment. He is also researching patients' attitudes and experiences of anti-dementia drugs.

Meetings attended by the Memory Clinic staff

8th National Conference on Dementias Feb 2006, London
Cognitive Neuroscience Society Annual Meeting, April 2006, San Francisco
Symposium on Dementia, Apr 2006, William Stokes postgraduate centre, St James's Hospital

8th National Memory Clinic Conference, Jun 2006, Edinburgh
Irish Gerontological Society Sept 2006, Galway
Neuroscience Ireland Inaugural Meeting Sept 2006, Cork
British Geriatric Society Autumn Meeting Oct 2006, London
European Societies of Neuropsychology Annual Meeting Oct 2006, Toulouse
Psychological Society of Ireland Annual Meeting, Nov 2006, Galway
DSIDC Dementia Symposium Nov 2006, St James'
All-Ireland Institute of Psychiatry Winter Meeting, Nov 2006, Belfast

Development of Stroke Research and Clinical Services, Mercer's Institute for Research on Ageing and St James's Hospital

Between five and six hundred patients of all ages with stroke are admitted to St James's Hospital annually and at any time there are up to sixty patients with a primary diagnosis of acute stroke admitted. Dr Joe Harbison was appointed a senior lecturer and Consultant Physician in Medical Gerontology in May 2006 to take a lead in developing stroke research and clinical services in St James's. Since then a number of changes in the management of patients with stroke have been instituted.

- All patients admitted with stroke are now reviewed by a consultant physician with a special interest in stroke or by a neurologist within 2 working days of their admission.
- A weekly Neurovascular clinic has been established to permit rapid review of transient cerebral ischaemic attacks (TIA's) and mini strokes. Patients receive a comprehensive clinical assessment and carotid ultrasound scans and brain scans are carried out without admission to hospital.
- A Cerebrovascular Disease Clinic has also been established to permit a specialist follow up of stroke and TIA patients discharged from hospital.
- A thrombolysis protocol has been established in conjunction with Accident and Emergency to permit the administration of "clot-busting" drugs to patients admitted with ischaemic stroke within 3 hours of stroke onset, the first such service in Ireland.
- Funding has been obtained to establish a nurse led blood pressure clinic for patients with stroke and cerebrovascular disease.

The development of a dedicated acute in-patient stroke unit to which all new patients with stroke will be admitted has now become a top priority for the hospital and work is also underway in developing a community stroke rehabilitation team which would be resourced to rapidly respond to the needs of new stroke patients who are discharged back to the community.

The following research studies are currently under way which will be undertaken by staff from the MIRA institute and clinical staff working in St. James's Hospital:-

- A study of the changes of bone metabolic activity and bone turnover in ambulant patients with stroke.
- A study of the prevalence of significant nocturnal hypoxaemia in stroke patients with dysphagia necessitating dietary modification.
- A prospective study of the effect of pre-discharge patient education and compliance with secondary prevention therapy.
- We have received ethical approval for a mechanistic study of the characteristics and associations of post-stroke fatigue.

Falls, Blackout, Bone Protection and Osteoporosis Unit

Bone Protection and Osteoporosis Service

In 2006 we further expanded our clinical nurse specialist staffing in the Bones, Falls and Osteoporosis area from three to five whole time equivalents. Half their time is taken up by Falls Prevention and the Assessment of Syncope and Blackouts and the other half is involved in Bone Protection and the treatment of Fragile Bones and Osteoporosis. They also work closely with the acute medical admissions unit and provide a dedicated fall and bone protection service to the hospital.

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. 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.

The initiatives undertaken by the Falls & Injury Prevention Service in 2006 include:-

1. Continuing Education In service Programme on Falls prevention for Nursing and ancillary staff. This includes staff on the orthopaedic unit, Medicine for the Elderly wards, Acute Medical Assessment Unit (AMAU) and Psychiatry of Old Age Department.
2. Training programme for nurses on use of falls risk assessment tools and bone protection protocols. Risk assessment tools and preventative programmes are now adopted by the Nursing Practice Development Unit (NPDU) and are incorporated into the nursing admission document for all Medicine for the Elderly and Acute Medical Admissions into the general hospital.
3. We continue to have quarterly Hip protector audits on acceptance and compliance on each ward. This information is fed back to the wards.
4. The Mercer's Institute continues to take a lead role in the assessment of falls and injury in the hospital and also acts as an education and training resource for hospital staff to lessen the possibility of patients being involved in falls and bony and soft tissue injury. A total of 481 Clinical Nurse Specialist (CNS) assessments/ reviews were conducted in 2006 throughout the hospital. 82 had injurious falls consisting of a fractured fibula, radius (1) and wrist (2). Other injuries included haematomas, lacerations, soft tissue injuries. Preventative measures were put in place to lessen the possibility of further falls and to protect the patient of further injuries. In the past year 146 staff members attended the Fall and Injury Prevention in-service training run by the Clinical Nurse Specialists in the Mercer's Institute.

This active involvement of the clinical nurse specialist in falls assessment, prevention and education has become a major role of the Mercer's Institute within the hospital and staff from other units and hospitals from different parts of the city and country visit the Mercer's Institute and St. James's Hospital for practical advice on fall prevention, protocol and techniques.

5. An audit was carried out on the appropriate use of bed-rails on the wards. Subsequent audits will be carried out to monitor the effect of education.
6. Research continues into individualised proper seating for heavy dependant patients in the longstay wards. When deficiencies have been identified the proper equipment and support seating for the individual patient is requisitioned and subsequently supplied to the patient.

Bone Protection and Fracture Prevention Service

A major development which occurred in the Unit in 2006 included an expansion in the number of patients attending the Bone Protection Clinic. This has been facilitated by the further increase in the work of our Nurse led Specialist Bone Protection and an Osteoporosis Pre-assessment Clinics. Dedicated hip fracture assessment clinics have now been developed in addition to the existing Colles Fracture and general osteoporosis pre-assessment clinics. A total of 275 new patients who had fractures were comprehensively assessed with DXA, bone markers and osteoporosis risk assessment questionnaires and they were subsequently reviewed in a specialised consultant led bone clinic.

Nurse Led Pre-Assessment Clinics

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 haematological workup and an estimation of serum bone markers. In addition, patients are counseled on the dietary and lifestyle changes necessary to manage osteoporosis, as well as advice on the prevention of falls and the wearing of hip protectors in those patients with a high risk of fracture.

Medical Bone Protection and Osteoporosis Treatment Clinics

These clinics have been further expanded over the past year. Over 320 new and 350 return patients and were seen by either Prof. J. B. Walsh and Dr. Miriam Casey respectively in association with their teams of bone research fellows and clinical specialist registrars. These clinics provide a comprehensive bone health service and a valuable training facility for medical and nursing personnel in the area of fracture prevention and osteoporosis management. They also provide a valuable resource for the in depth study of fragile bones in a Irish population and last year have facilitated research within the Department of Clinical Nutrition. Our registrar's research on the high prevalence of Chronic Renal Failure amongst osteoporotic patients was awarded second place at the Irish Geriatric Society annual scientific meeting of 2006.

Over 140 severely osteoporotic elderly subjects have now embarked on treatment with recombinant Parathyroid Hormone Therapy (PTH). This relatively new treatment will reduce their chance of having a subsequent severe vertebral fracture by

90%. Impressive improvements in quality of life have been noted and patients regularly relinquish the need for lumbar support corsets, reporting improvements in flexibility of their spines and general mobility. Despite the advanced years of our population 300-400% increases in the rate of biochemical bone formation following PTH have been noted in patients up to 92 years of age!! The role of the CNS has been crucial in ensuring the ongoing compliance of patients to daily self-injection for a prolonged duration of 18 months.

Our unit has continued to participate in a multi-centre European trial of Parathyroid hormone therapy for patients with advanced osteoporosis. We continue to evaluate the use of Vibrating Platforms for the stimulation of bone formation and the prevention of osteoporosis in the Bone Protection clinic.

Ortho-Geriatric Liaison Service

In 2006 all acute hip fracture in-patients (n=164) benefited from a multidisciplinary review by the orthogeriatric team. A considerable number of in-patients with pelvic fractures and acute vertebral fractures were also assessed. This service contributes greatly to preventing further fractures in this population, 10% of whom without intervention would sustain a contralateral hip fracture within five years of the initial one. We are continuing to collect data on hip fracture patients which will provide us with a closer insight into the causation, clinical features and bone profile status of this very common and widespread condition among the Irish elderly population.

Colles and Peripheral Fracture Follow up Clinic

All elderly patients presenting to St. James's Hospital with a recent wrist fracture or upper arm (humeral) (n = 81) fracture were followed up in a separate specialised peripheral fracture bone follow up clinic. Their risk factors for further fracture are assessed and they are commenced on a bone protection regimen. This group will also provide the Mercer's Institute with a very valuable data set on peripheral fractures in an Irish elderly population.

MIRA DXA (Clinical Densitometry) Service

In 2006 the activity of the DXA service increased significantly with 1660 scans performed and over 50% of these demonstrated osteoporosis.

In addition to providing a DXA service for the Mercer's Institute and MedEL Directorate patients the DXA unit continued to provide an assessment service for all other patients with osteoporosis in St. James's Hospital. It also provided a free service for patients who were referred directly to the DXA unit by their General Practitioners from the local catchment area.

Bone Marrow and Elderly Renal Transplant Patients

This unit continues to undertake a comprehensive assessment of the bone status of all patients who have undergone bone marrow transplants (BMT) in St. James's Hospital the only centre for BMT in Ireland. This has allowed us a unique opportunity to assess the bone status of patients who have undergone this procedure and whose bones have been exposed to immunosuppressive and therapeutic agents which can rapidly age their bones. This work is undertaken in close collaboration with the National Bone Marrow Transplant Unit.

A similar longitudinal assessment and follow up of all renal transplant recipients in the St. James's and Tallaght Hospital catchment areas is ongoing with the Department of Nephrology attached to both hospitals. These renal transplant patients are at high risk of steroid induced bone disease complicating their existing renal osteodystrophy. The biochemical, ultrasound and DXA facilities within the Mercer's Institute for Research on Ageing has facilitated the identification of those high risk recipients who require urgent treatment.

National Training Courses in DXA (Clinical Densitometry)

Two national courses were organised for staff working in the area of DXA in Hospitals and Community and Primary Care Units throughout Ireland in October 2006. These courses were undertaken in close collaboration with the Department of Radiology and Medical Physics in St. James's Hospital with the Department of Metabolic Bone Disease in St. Vincent's Hospital and the Department of Anatomy in College of Surgeons and Department of Tissue Engineering in Trinity College, Dublin. The first course was mainly for people working in Ireland while the second course integrated members of a European consortium who were involved in ongoing research in the area of clinical densitometry, research and development.

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 most comprehensive national bone biochemical service to patients available in this island. 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 patient's 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 and the Mercer's Institute and the patients who attend our Bone Protection Clinics are very fortunate to have the benefit of such a close working relationship with Dr. Crowley and Dr. Healy. We would like again to take the opportunity in this year's annual report to specifically thank them for their invaluable support and for giving so freely of their time and expertise.

Research from the Falls, Blackout and Bone Protection Unit was presented at international meetings in the USA, Europe, the UK and Ireland during 2006.

“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 Prof. Patrick Prendergast, Prof. Clive Lee and Prof. David Taylor and Dr. Fergal O’Brien. Animal models of osteoporosis are studied and the Mercer’s Institute for Research in Ageing and the Department of Clinical Biochemistry in St. James’s Hospital are involved in the measurement of bone markers in the animal studied and in evaluating potential assessment tools and laboratory analyses of bone tissue and molecular markers in patients with clinical osteoporosis. It thus provides a link from bench to bedside in a clinical condition which is very prominent in elderly patients.

Conferences Attended by Unit Clinical and Research Staff where research and clinical work was presented

British Geriatric Society Meeting, April 2006.

54th Irish Gerontological Society Meeting, Galway September 2006.

International Osteoporosis Foundation, Toronto June 2006

European Society for Calcified Tissue Geneva, May 2006 .

Bone and Tooth Society, July 2006 .

National Osteoporosis Society Meeting, Harrogate UK.

American Society for Bone and Mineral Research (ASBMR) Philadelphia September 2006.

Publications: c.f. appendix

Falls and Blackout Service

Introduction

The Falls and Osteoporosis service in MedEL Directorate was set up in 2003 under the stewardship of Prof. J. Bernard Walsh, Dr. Miriam Casey and Dr. Conal Cunningham. Prof. Rose Anne Kenny, an internationally recognised leader in Falls and Blackouts joined the Department in September 2005 as head of Medical Gerontology and Director of the new Falls and Blackout section of the Unit. Over the past three years, both the Falls and Osteoporosis services have grown exponentially in the level of diagnostic activities, personnel appointments and collaborative research. A summary of the osteoporosis service is discussed above and the following is a summary of the first three years of the Falls and Blackout Service.

There are two strands to the Falls and Blackout service:-

Falls and Blackout unit (FABU) (out-patient)

Falls and Injury prevention Programme (In-patient)

In-patient Falls and Injury prevention Programme

This is a Clinical Nurse led programme that targets patients who are at high risk of falls and is the first of its type in the country. Extra assessments and interventions are provided to patients while they are in hospital. The strategy for falls prevention includes the development of Integrated Care Plans, detailed collection of faller information on dedicated databases, on-going staff training in fall prevention and a regular in-patient audit program looking at the effectiveness of our service using certain key quality of care indicators (fall risk stratification of patients, hip protector compliance and fallers identification alert).

As a result of the first three years of the in-patient falls prevention programme, falls documentation has risen from 61% to 100%. There is an increase in compliance with falls prevention measures (33% to 86%) and reduction in recurrent in-patient falls (62% reduction). Injurious falls were also reduced by 20%.

Apart from the in-patient service, those involved in the Falls Prevention team are significantly involved in the delivery of training in falls prevention to a wide variety of hospital and community based health care professionals.

The falls and blackout service also participated in the successful MedEL accreditation process in 2006.

Summary of first 3 years of Falls and Blackout Service at SJH

Since the appointment of Professor Rose Anne Kenny from Newcastle in 2005 a significantly expanded FABU was opened on the main hospital site by the Minister for Health in December 2005.

The Falls and Blackout Unit in 2006 saw its activity increase almost 1000% since its inception in 2003.

The FABU is currently achieving a diagnosis in 93% of cases.

The in-patient falls prevention program has increased falls documentation from 61% to 100%.

The in-patient falls prevention program has increased compliance with falls prevention measures from 33% to 86%.

The in-patient falls prevention program has reduced recurrent falls by 62%.

The in-patient falls prevention program has reduced injurious falls by 20%.

The Integrated Care plan for management of blackouts in the Emergency Department has increased referral rates to the FABU by 500% and the ED is now accounts for a third of all new referrals.

Staff appointments

The past year 2006 has witnessed a significant expansion of the Falls and Blackout Unit (FABU). In conjunction with Professor Kenny's appointment, additional clinical nurse specialists (Dymphna Hade – from Medicine in the Elderly, Lisa Byrne from Cardiology), clinical research fellows (Orla Collins, Hilary Cronin, Sean Kennelly) and extra secretarial support (Heather Bailey) were recruited. As part of the development, FABU also formalised links with the Medical Physics Department where they provided expertise in maintenance and repair of the equipment in the unit.

New Equipment

With the appointment of Lisa Byrne who is an ACLS Instructor and previous extensive experience in cardiology, we now have additional diagnostic tools available to the FABU (Holter and event monitoring). Furthermore, a gait assessment system (GaitRite) was purchased in August 2006 for the FABU to provide comprehensive evaluations of patients with falls and instability.

Activity

The unit has seen its activity increase almost 1000% since its inception. In the year 2003, we assessed 72 patients. The extra staffing and clinic allocations allowed us to assess and treat over 1100 new patients from all over the country in 2006. On average, 45 patients were assessed each week since July 2006.

We also provide an active auxiliary service including ambulatory blood pressure monitoring, event monitoring and holter monitoring. There will be a new nurse-led

autonomic function assessment clinic in 2007 and we hope to introduce a same day falls assessment service to the ED in the coming year.

Links with other departments

We continue to have strong links with the Acute Medical Assessment Unit (AMAU) and Emergency Department (ED). We have devised Integrated Care Plans for Blackouts in the ED and AMAU devised in conjunction with the Departments of Cardiology and Neurology in order to facilitate appropriate patients to have rapid access to the FABU and reduce inappropriate admissions. An ED Liaison Initiative and was established by Dr Frances McCarthy and Dr Conal Cunningham in association with the ED physicians in 2005. This initiative has resulted in a 5-fold increase in referrals from ED.

FABU patients who have balance and gait impairment are referred to the Robert Mayne Day Hospital or Community Reablement Unit for rehabilitation. The level of activity in these two services has also increased as a result of referrals from FABU.

We continue to build a strong diagnostic and therapeutic link with Cardiology and Neurology. There is also a strong teaching culture within the FABU (ED and AMAU lecture series, SpR training, undergraduate and post-graduate teaching). There is also a close link between the universities and FABU. There are further opportunities in future to establish links with Oto-rhino-laryngeal specialties within St James's Hospital. The FABU provides a setting for a consultant-led Transient Ischaemic Attack (TIA) clinic under Dr Joe Harbison (Senior Lecturer, TCD) and a cognitive science study (Professors Kenny and Lawlor) Clinic.

Ongoing Research projects

The Falls and Blackout Service believes that excellence in clinical research goes hand in hand with excellence in clinical practice and therefore has a strong commitment to high quality research with several on-going grant funded doctoral research studies. Our intention is for the majority of studies to be published in high impact international journals.

Current studies include:

The effectiveness of an Integrated Care Plan for syncope in patients presenting to the ED

The costs of treating patients with syncope admitted to an Irish teaching hospital

The prevalence of syncope in patients presenting to the ED of an Irish teaching hospital

The physiological effects of sleeping head up 18 inches in young healthy volunteers (collaboration with department of Physiology, TCD and Biochemistry department)
Prevalence of orthostatic hypotension in patients on parathyroid hormone for osteoporosis

Systematic review of cardiovascular causes of falls in older persons

Determinants of symptoms during standing in patients with and without orthostatic hypotension

Open randomised control trial of sleeping head up 6 inches in older patients with orthostatic hypotension (community study)

In-patient observational study of sleeping head up 6 inches in patients in hospital with orthostatic hypotension

Early predictors of the outcome of tilt table tests in patients with vasovagal syncope during standing

Cerebral oximetry as a surrogate marker for cerebral hypoperfusion (medical-physics)

TRIL – Technology Research for Independent Living

New Research and development project with INTEL

The incidence of falls increases with the aging population. With associated co-morbidity and frailty, the older persons are particularly at risk of falls. Injuries as a result of falls may precipitate admission into institutional care.

Intel Corporation, as part of the Digital Health Group, has identified an exciting area of research for the ageing population. In a joint venture with IDA, INTEL will launch a research platform called **Technology Research for Independent Living Centres (TRIL)** which bring together research teams from across three Irish Universities (TCD, UCD and NUI, Galway). The aim is to develop electronic devices which will allow older persons to continue to live independently in their own homes.

One of the strands of the research initiatives is to determine early markers and behavioural changes in persons at risk of falls. The technologies will be tested firstly in a clinical laboratory and then translate the technologies into the older person's home. The devices allow for monitoring of cardiovascular, visual, vestibular, cognitive, gait and balance parameters in those who are prone to falls. The aim is to provide early feedback to the older persons before falls occur. The project will also study the interplay between visual-vestibular-proprioception and the cardiovascular system and how they affect balance and gait. The clinical laboratory will be located in St James's Hospital (Hospital 4, Top Floor). Dr Chie Wei Fan who was a lecturer in medical gerontology, TCD who has worked in FABU for the last 3 years will be the clinical director for research for this project. Dr. Stuart Smith, UCD will be Senior Researcher. Patricia Malone, who previously was the Business Manager in the GEMS Directorate of St. James's Hospital, has been appointed as the Programme Manager for the grant. Future appointments will include 2 doctors, 5 postdocs, 1 nurse and 2 technicians.

Other components of the TRIL, impaired cognitive function and social isolation, are described on other sections of the report.

Funding:

Refurbishment costs Hospital 4 Top Floor:	€148,050
TRIL Falls strand – salaries, travel consumables:	€259,044

The Irish Longitudinal Study on Ageing (TILDA)

Background & need for research

One of the great success stories of modern times is the increasing number of people living into old age. However, this triumph of humanity is also one of our greatest challenges. The proportion of the population aged 65 and older in Ireland is projected to rise to 15% by 2011 and to 19% by 2031 (DOH 1999). The greatest increase will be in the oldest old, the over 80's, which is expected to rise by 66% by 2035 (Fahey 1995). Ageing on this scale is an unprecedented phenomenon in Irish history.

In a stark contrast to the evident importance of ageing, there is a dearth of social, psychological and health information on older persons in Ireland needed to enable forward planning and to ensure a 'healthy and happy' life span in later life. Furthermore disturbing mortality data underpin the urgent need for such information. Ireland has the lowest life expectancy in Europe (2002). The health, social, economic, environmental and genetic factors which contribute to such a strikingly higher mortality are, as of yet, unknown. No less disturbing is the information we have on the economic circumstances of older people in Ireland: the proportion of older Irish people living in relative income poverty had increased to nearly 45 % by 2001.

To develop an environment for ageing well we need to characterise the older Irish citizen and explore factors which determine successful aging. This can only be done with the help of a nationally representative survey of our older population that will act as the foundation on which we can plan appropriate health, medical, social and economic policies. The proposed study would 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, and 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 objective of this study is to provide up-to-date and on-going information which will drive reform of the health and social services and society to enable successful ageing, influence perceptions of ageing, commission and provide best models of care for older Irish citizens now and for future generations by determining

- the health needs of older people
- the social and economic needs of older people
- the health and social needs of families and carers of older people
- the biological and environmental components of 'successful ageing'
- the contributions that older people are making to society and 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. This is an ambitious but crucial agenda.

The research team is broadly divided in to 3 strands – health, social and economic.

A. The “Health Strand”

PI’s: Professor Rose Anne Kenny, Professor Hannah Mc Gee, Professor Ivan Perry
Researchers: Dr. Hilary Cronin (SpR in Geriatric Medicine) and Ms Claire O’Regan

The Objective is:

To identify the key medical questions that need to be answered based on an extensive literature search of previous longitudinal studies.

1. What changes occur in physical, psychological and cognitive function over time and across ages?
2. What are the determinants of changes in physical, psychological and cognitive function over time and across ages?
3. What are the adaptive responses to changes in physical, psychological and cognitive function over time and across ages?
4. How do changes in functioning, and adaptations determine successful aging?

TILDA is taking place after many international longitudinal studies, so we are in a unique position to capitalise on output and lessons from previous studies. In this context we plan to work closely with partners in the US National Institute on Ageing that has both co-ordinated the Health and Retirement Study and played a significant role in the current English Longitudinal Study on Ageing.

To determine the most appropriate medical assessments for this study, paying particular attention to
Cardiovascular (Blood Pressure),
Neuro-psychological (Mood, Sleep, Cognition),
Locomotor (Gait, Balance)
Disability
Oral Health
Blood samples for routine haematology, biochemistry and lipid profile
Nutritional markers
Inflammatory markers (including cytokines)

To develop novel methodologies using innovative technologies in collaboration with the Intel research program.

B. The “Economic Strand”

PI’s: Professor Charles Normand, Professor Brendan Whelan, Professor Colm Harmon
Researcher: Dr. Amilcar Moreira

In order to capture how ageing impacts on Irish society, the economic research within TILDA will be organised around four main research themes:

1. Income security in older age and pensions

Besides measuring to what degree the current institutional arrangements that secure income support in old age guarantee individuals a level of income that secures a dignified life, TILDA will investigate the factors, both socio-economic (incentives/disincentives to retire, health condition, socio-economic status, etc) and institutional (structure of pension system, labour market regulation, taxation, etc.) that determine the individuals post-retirement income.

2. Work in older age, retirement strategies and the work/leisure choice

The purpose here is to describe the labour market trajectories of older individuals. Particular attention will be given to the individuals' transition to retirement, the factors that condition it, and how the individuals' decision to retire is influenced by the institutional frameworks (pension system, labour market regulations, taxation, etc) that regulate it.

3. Inequalities in income and living standards in older age

Anchored around the notion of 'consistent poverty', the purpose here is to identify patterns of distribution of income and living standards among older people, and the factors that condition them. These will be contrasted with the situation of people at younger ages (in terms of the balance between resources and needs). The longitudinal dimension of TILDA will allow us to identify key inflection points during the life course where these patterns change significantly. While acknowledging the role of pension systems and taxation in conditioning the distribution of income and access to resources, attention will also be given to the role of in-kind benefits. The crucial effect of wealth and assets (including residential property) will be studied including the direct effect on living standards and the indirect effects on retirement decisions care patterns etc.

4. Paying for health and social care

The purpose here is to map older peoples' needs for social and healthcare, their costs and their impact on the management of household income and assets. On the other side, TILDA aims to identify the factors that condition the individuals' choice of services and the management of health and care costs, particularly with regards to the role of the healthcare system, health insurance, community and domiciliary care services, taxation.

Despite their specificity, the work developed under these themes will always have in mind the overlaps between them (for instance, how pension systems condition the distribution of income across society and the individuals' participation in the labour market, etc) and with other areas of research in TILDA, be it in the social domain (for instance, how access to care services affects individuals' labour market participation, etc.), or the health domain (for instance, how health status influences the individual's position in the distribution of income, etc.).

C. The “Social Strand”

PI: Dr. Virpi Timonen

Researcher: Dr. Yumiko Kamiya

This aims to look at four core themes, fundamental to an individual’s social network.

1. Co-residence: Family structure and living arrangements

This involves collection of information on the kin (family) members, and identification of the individuals that the respondent co-resides with. Typically, information is sought on any surviving spouse/partner or former spouse(s), parents (-in-law), (live) children, grandchildren, great-grandchildren, and siblings.

2. Contact

The geographical distance between kin members and the respondent and the frequency of contact is established. The family and employment status of children is established with the view to analysing how this influences frequency and nature of contact / care. Number and frequency of *non-kin* contacts (friends, ‘personal communities’) of the respondent should also be established.

3. Care

It is important to take a bi-directional approach to this i.e. to probe both into the care and support provided by the older respondent and the nature and frequency of care received by the respondent. The questionnaire should also furnish us with information on the source of care received and the recipient of care provided by the respondent.

4. Community

This theme comprises social participation and perceptions of the community in which the respondent lives (housing, safety, cleanliness, crime). Social participation covers social and leisure activities that have a purely ‘leisure’ character but also ‘civic’ engagement such as membership of interest groups, parties and other organisations, and voluntary work. It is proposed that ‘religiosity’ (frequency of religious service attendance, possibly in combination with other indicators such as freq of praying, whether brought up religiously by parents) be included under this theme as it can be construed as ‘social’ activity and is of particular interest in the secularising Irish context.

Funding:

€4million Irish Life. €800K Atlantic Philanthropies

HRB Translational Research Award 2006

Title: Neurocardiovascular Influences on Cognitive Functioning: Basic and Clinical Mechanisms

Description of Study

This study commenced in October 2006 and is a 5 year programme which studies the influence of Neurocardiovascular Instability on cognitive decline in subjects with Mild Cognitive impairment. Mild Cognitive Impairment (MCI) is a transitional zone between normal cognition and dementia. It is poorly understood what factors underpin the conversion from MCI to dementia. Although hypotension is frequently cited as a risk factor for dementia, there has been little research into the role of hypotension as a causal factor for MCI or it's conversion to dementia

Over a 3 year period, 400 subjects with MCI and 150 controls will be recruited. The majority of MCI subjects are aged between 70 and 85 years but there are no strict age limits. To achieve our recruitment goal, the Cognitive Studies Clinic was set up in St James's hospital in November 2006. This clinic accepts referrals from GPs, the Dublin Ageing research network (DARN), and patients from the MIRA who may be interested in participating in research studies. All patients referred to this clinic have thorough clinical and neuropsychological assessments and are discussed at a consultant lead consensus meeting. Approximately 5 patients are assessed per week and since November almost 50 patients have attended this clinic. Suitable and agreeable patients are given the opportunity to participate in this or other research programmes in St James' Hospital.

Following recruitment both cohorts (cases and controls) have baseline neuropsychological assessments. Neurocardiovascular assessments and detailed neuroimaging. These assessments take place annually over a 3 year period except the neuroimaging with takes place at baseline and 3 years follow up. The neuropsychological tests are well validated and include the CAMCOG (global and executive function), and the CDR (a computer base touch screen technique which assesses speed and attention). Elderly controls have no memory complaints and score within the normal range on CAMCOG.

The neurocardiovascular assessments include phasic blood pressure responses to active standing and carotid sinus stimulation, 24 hour ambulatory blood pressure monitoring and autonomic function tests (using methods validated in dementia to determine sympathetic and parasympathetic function including heart rate variability by frequency analysis). Detailed neuroimaging takes place in TCIN using MRI imaging. White matter changes on MRI have been shown to correlate not only with the severity of cognitive impairment in MCI and dementia, but also the severity of hypotension. Using MRI techniques including magnetization transfer ratio, DTI and volumetry, we hope to explore the sequential and causal association between hypotension and dementia.

Funding:

Health Research Board (Translational Research Award) €1.5 million

Lead PI: Professor Rose Anne Kenny, Professor of Clinical Gerontology

PIs: Professor Brian Lawlor, Conolly Norman Professor of Old Age
Psychiatry

Professor Michael Rowan, Lecturer in Pharmacology

Research Team:

Dr. Orla Collins, Clinical Research Fellow

Dr. Germma Irvine, Clinical Research Fellow

Sheila Dillon, Clinical Research Nurse

Dr. Christian Kerskens, Research Fellow

Service Developments

1. Cognitive Studies Clinic in St James's Hospital - This clinic commenced in November 2006 and was established specifically to recruit patient who may be interested in participating in research studies. Referrals come from primary, secondary and tertiary care. All patients have thorough clinical and detailed neuropsychological assessments. All referrals are discussed at a consultant lead consensus meeting. Suitable patients are given the opportunity to participate in research studies. The most appropriate follow-up of all patients following their assessment is agreed at the consensus meetings.

This clinic is staffed by 2 doctors and 3 nurses with secretarial support and takes place in the falls and blackout clinic (FABU) on Thursday mornings.

2. Heart rate variability programme and analysis package from the biomedical laboratory in UCD which can be used in the FABU in autonomic function testing.

Roskamp (Nilvadipine) Study

Title: An open label evaluation of the safety and efficacy of Nilvadipine (Nivadil) in mild to moderate Alzheimer's dementia.

Date of commencement : 1st July, 2006.

Study objectives:-

The objectives of this study are to
investigate the safety of Nilvadipine.
to investigate the effects of Nilvadipine on cognition.
to examine the effects of Nilvadipine on plasma and serum levels of beta amyloid.
to examine the effects of Nilvadipine on cerebral vascular haemodynamics as measured via trans cranial Doppler.
to examine the effects of Nilvadipine peripheral haemodynamics in patients as measured with active stands, twenty-four hour blood pressure monitors, etc.

Study design:-

this study employs an eight week open label design.

Study duration:-

two year duration.

Size:-

150 subjects with Alzheimer's dementia. 100 will be treated with Nilvadipine and 50 will receive no treatment.

Number of study sites:-

The patients are being recruited via the collaboration network of the Dublin Aging Research Network, which is a group composed of Consultant Geriatricians, Consultants in Old Age Psychiatry and Consultant Neurologists in the Dublin area. Collaborators are based at Beaumont Hospital, James Connolly Memorial Hospital Blanchardstown, St. Columcille's Hospital Loughlinstown, Mater Hospital, St. James's Hospital, St. Vincent's Hospital and the Adelaide Meath National Children's Hospital Tallaght among others. All the collaborators have an interest in the care of subjects with Alzheimer's dementia.

Subject type:-

for the purpose of the Roskamp study we are recruiting subjects with mild to moderate Alzheimer's dementia MMSE range 14 – 27.

Test drug dosage:-

Nilvadipine 8 mgs. sustained release capsule for the treatment group taken once a day at lunch time. There is no drug treatment in the control group.

Study Parameters:-

parameters will be measured prior to, during and at completion of the study period.

Primary diagnostic efficacy:-

will be based on changes in cognitive function, changes in plasma and / or serum levels of Alzheimer's beta amyloid as measured by enzyme linked immunosorbent assay (ELISA). In addition safety will be assessed by physical examination, electrocardiogram (ECG) and clinical laboratory tests which will include phasic orthostatic blood pressure measurement, twenty-four hour ambulatory blood pressure measurement and transcranial Doppler measurements of middle cerebral artery blood flow.

Number of visits:-

There are six visits in total. The objective of this study is that most of the visits are performed in the subject's home. Two visits to perform the laboratory tests are performed in St. James's Hospital. The remainder are performed in the subject's home. Where a subject prefers it we can perform all the visits at St. James's Hospital.

Staff for study:-

Dr. Sean Kennelly, Clinical Research Fellow
Sharon Bolger, Clinical Research Nurse
Claire Mooney, Clinical Research Nurse
Linda Warren, Administrative Support

Study to date:-

As of 22nd January, 2007 we have recruited twenty-one subjects into the study. Several of those have completed the study period.

Cognitive Studies Clinic:-

To facilitate the recruitment of subjects for these trials a cognitive studies clinic has been established on a Thursday morning in the Falls and Blackout unit of St. James's Hospital. The two principal investigators of the study, Prof. Rose Anne Kenny and Prof. Brian Lawlor, supervise this clinic. On average five subjects are screened each Thursday. They receive a comprehensive history and physical examination and following this have a thorough neuropsychological evaluation. They are then referred where appropriate for further neuro-imaging. Following this all these subjects are discussed at the Consultant led consensus meeting in the MIRA Memory Clinic at St. James's Hospital.

Clinic commenced on 9th November, 2006. We have screened approximately forty-five subjects to date. These subjects come from a wide geographic spread but are primarily from Dublin city and surrounding counties. The subjects age range is from fifty to ninety years of age. Referrals are received from general practitioners and physicians in the DARN collaboration.

Funding:

The Roskamp Institute, Florida. €850K

Medical Physics and Bioengineering Research Program at Mercer's Institute for Research on Ageing

Assistive Technology Research Activity at MIRA

There is considerable interest at present in the potential for technology to help improve the quality of life of the older person and their carers. It would appear that technology has reached a point where unobtrusive, user friendly and useful 'assistive technologies' can be practically implemented. Even off the shelf consumer devices such as mobile phones contain so much processing power that their adaptation for an assistive role can be considered.

Efforts in this area in the last year at MIRA have focussed on building a process to develop, test and deploy assistive technologies which are of genuine benefit to the end user. The key to this process is the integration of clinical knowledge and engineering expertise with input from older people and their carers. All these resources are available in MIRA, placing it in an excellent position to make a positive contribution to quality of life through appropriate technology.

Following consultation initiated on the types of problems faced by the older person, three pilot projects have been adopted. Prototype demonstration devices for these projects have been built in the MIRA engineering lab. Each project is an end in itself, presenting a real problem to which we hope to deliver a solution. Equally importantly, undertaking these projects will help us explore how best to manage diverse skills and knowledge sources to deliver useable, useful devices for the older person.

The three projects are:

Night Lamp: An automatic night lamp has been built which is triggered when a subject leaves bed in the middle of the night. The lamp is designed to reduce disorientation and the possibility of falling in an older age group. The device design draws on experience with similar technology tested in other studies.

It incorporates a simple trigger mechanism and can be used with a subject's existing bedside lamp.

Locator device: Losing everyday objects in the home was identified as a source of frustration for the MIRA patient group. While devices are commercially available for 'tagging' and locating objects such as reading glasses and wallets, they are not in general designed with the older person in mind. In the MIRA lab we have demonstrated a simple prototype incorporating the technical features required of such a device. In this prototype, the user is alerted of the location of the lost object via a mobile phone text message, but several other types of user interface are equally realisable. We are now determining how best to configure the locator device to be suitable for use by an older person. In parallel, we have identified a commercial device that may be suitable for a carer group and are putting in place an assessment of its utility.

Exercise feedback: In this project an exercise cyclopad (a set of foot pedals) used in exercise programmes in the Day Hospital has been adapted to give visual feedback to the user. A sensor detects the rotation of the pedals and the user views a video image driven by their exercise effort. The user can view a video simply representing cycling through the countryside or more abstract video images representing a cycle through recent historical events. The aim is to build a platform to test the benefits of providing visual feedback during exercise. There may be a direct benefit in terms of exercise compliance and an indirect benefit in providing a more engaging and enjoyable experience for older persons attending rehab exercise classes.

Eye Tremor Research

The eye tremor measurement system originally designed at MIRA has now been redesigned and rebuilt at the MIRA engineering lab and has gone into use as a research tool. The device allows the investigation of OMT (Ocular Microtremor), a very rapid eye movement that carries diagnostic and prognostic information on brain function. MIRA researchers carried out much of the original basic scientific and clinical investigation of OMT and this new device will allow MIRA to continue as a leading centre in OMT research. The device redesign brings the system up to date with current electronic and signal processing techniques. Several presentations on the system were made at national and international scientific conferences in 2006.

In parallel, the design of an alternative system for measuring OMT is continuing. This optical system is based on a design originally conceived at MIRA and will require no contact with the surface of the eye. Optical engineering facilities have been made available to MIRA personnel through co-operation with UCD, and bench top demos of the measurement technique used have been carried out.

The technical programme of OMT measurement system design is integrated with a programme of clinical investigation.

A special study on Occular microtremor in brain lesions, neurodegenerative disease, altered arousal states and visual dysfunction which is being led by Dr. Niamh Collins is described above in the Memory Clinic section.

Syncope and Falls Research – Biophysical Analysis of the Baroreflex with Applications Syncope and Falls Research – Biophysical Analysis of the Baroreflex with Applications in Falls, Syncope and Brain Ageing

The theme of this research strand is the design and development of novel research tools and techniques to compliment ongoing investigation of NeuroCardiovascular Instabilities (NCVI's) in the Falls and Blackout Unit (FABU) at St. James's Hospital.

Carotid Sinus Syndrome (CSS) is a major contributor to syncope and unexplained falls in the elderly. Currently Carotid sinus massage is the clinical tool of choice when diagnosing CSS. Investigation of an alternative less invasive approach to CSS diagnosis is underway at MIRA. The aim is to develop a technique which is standardised, safe and suitable for elderly patients. The technique is based on signal analysis of a range of standard physiological markers readily measurable in a clinic.

The proposed system has undergone initial clinical trials in FABU, the results of which are to be presented at the National Syncope Conference, Ireland in early 2007.

Future work in this area is aimed at refining the methodology and underlying simulation work.

In parallel with these efforts works is being carried out on improved technical measures of falls risk. This work forms part of the TRIL (Technology Research for Independent Living) Falls Kinesiology research strand and is conducted in conjunction with clinicians from FABU, and psychologists from UCD. We have built a virtual tilting environment that allows us to mimic the perceived visual and auditory effects of tilt-table testing and their influence on autonomic function. It is hoped that this system will help investigate the role visual stimuli play in neurocardiovascular modulation especially in syncope and falls.

Conferences 2006

Noonan D, Boyle G, Foran T, Hegarty F, Finucane C, Collins N, Coakley D. The design and build of a device to measure Ocular Microtremor (OMT). *Bioengineering in Ireland Conference, January 2006.*

Al Kalbani M., Collins N., Finucane C., Ryle J., Boyle G., Coakley D., Eye Movement Distortion in High Resolution Retinal Imaging, *Engineering the Eye II, Galway, Ireland, June 19-21, 2006.*

Piezoelectric strain gauge system development for measuring Ocular Microtremor (Al Kalbani M, Collins N, Boyle G, Foran T, Hegarty F, Coakley D. *Institute of Physics and Engineering in Medicine, Annual Scientific Meeting, Cambridge, Sept. 2006.*

The Design and Build of a Portable Device to Measure Ocular Microtremor (OMT) Noonan D, Boyle G, Foran T, Hegarty F, Coakley D. *Frontiers in Biomedical Devices, Irvine, California, June, 2006.*

Donation of computers and IT equipment to Pallotti Secondary School, Northern Tanzania

Pallotti Secondary School is run by the Pallotine Sisters and is situated in the village of Siuyu, near the town of Singiola. 31 computers which had been in daily use by the MIRA staff but which had been updated over the last few years to more modern machines were donated to the Pallotti Secondary School in Tanzania. All these machines were in full working order and a range of non commercial and public domain software were installed by our computer technologist and consultant Mr Vincent Quinn who works in the Mercer's Institute two days a week. Vincent collaborated closely with a Mr Tom Mc Mahon who runs a non profit organization who co-ordinated the shipping and deployment of these computers to Tanzania. We were delighted that we were able to recycle these computers overseas to the third world and that they are now in daily use by secondary students in East Africa.

Partnerships

St. James's Hospital

Medicine for the Elderly
Psychiatry and Psychiatry for the Elderly
Clinical Biochemistry
Clinical Medicine
Haematology
Renal Medicine
Endocrinology
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 Presentations

This consists of publications and scientific presentations carried out by MIRA personnel during 2006. It includes collaborations with other departments.

Blanco-Campal A, Burke T.E, Coen R.F, Lawlor B.A, Walsh J.B (2006) Prospective memory is a sensitive indicator of Mild Cognitive Impairment. *The Irish Psychologist*, 33(3): 55. [Platform presentation, Psychological Society of Ireland Annual Meeting, Galway, November, 2006]

Blanco-Campal A, Burke T.E, Coen R.F., Lawlor B.A, Walsh J.B (2006) Prospective memory in Mild Cognitive Impairment: subgroup analysis of subtypes. *Irish Journal of Medical Science*, 175 (3, Supplement 2): 60. [Poster Presentation [RC], Irish Gerontological Society Annual Meeting, Galway, September, 2006]

Brewer L.M, Cronin H, Murillo G, Healy M, Walsh C, Maher N, Walsh J.B, Casey M.C. Factors determining bone turnover in an elderly population-not previously treated with Bisphosphonates. *Calcif Tissue Int*. 2006: 78 (Supplement 1) S74

Brewer L, Cronin H, Murillo G, Walsh J.B, Casey M.C. Assessing the relationship between low Vitamin D and PTH levels in elderly osteoporotic patients, not on a bisphosphonate, using bone markers and DEXA: can we derive a new range for normal PTH levels in an older population? *Calcified Tissue Int*, vol 78, suppl 1, 2006, pp S1-S186

Caffrey N, Casey M, Walsh J.B. Standard studies or substandard 'standard of care'. *J Bone Miner Res* 2006: 21(3) 491

Caffrey N, Healy M, Stein G, Walsh C, Casey M.C, Walsh J.B. Response of bone markers to PTH therapy in the first 3 months of treatment. *J Am Ger Soc* 2006 54 (S4) 56.

Chin AV, O'Connell H, Kirby M, Denihan A, Bruce I, Walsh J.B, Coakley D, Lawlor B.A, Cunningham C. Co-morbid and socio-demographic factors associated with cognitive performance in an elderly community dwelling Irish population. *Int J Geriatr Psychiatry*. 2006:21(12):1150-5.

Coen R.F. (2006) Neuropsychological aspects of Frontotemporal dementia. *Dementia Bulletin*. *Old Age Psychiatry*, Spring 2006, 3-4.

Cronin H, Inderhaugh J, Walsh J.B, Casey M.C. Osteoporosis and Parkinsons Disease. *J Am Geriatr Soc*. 2006 54(11):1797-8

Cronin H, Brewer L, Walsh J.B, Casey M.C. The effect of renal function on your risk of vertebral and peripheral fractures. *Irish J Med Sc* 2006: 175(3):S2:1-75

Cronin H, Walsh J.B, Casey M.C. The prevalence of Orthostatic Hypotension in Osteoporotic Patients treated with recombinant PTH. *Irish J Med Sc* 2006: 175(3):S2:13

Cronin H, Casey M.C, Fan C, Walsh J.B. Assessing the effect of PTH on orthostatic blood pressure in older osteoporotic patients. *Age and Ageing* 2006 35:S3:13

Cullen B, O'Neill B, Evans J.J, Coen R.F, Lawlor B.A. A review of screening tests for cognitive impairment. *Journal of Neurology, Neurosurgery and Psychiatry* (in press)

Cullen B, Coen R.F, Lynch C.A, Cunningham C, Coakley D, Robertson IH, Lawlor B.A. Repetitive behaviour in Alzheimer's disease: description, correlates and functions. *Int J Geriatr Psychiatry* 2005:20(7):686-93.

Cullen B, Fahy S, Cunningham C.J, Coen R.F, Bruce I, Greene E, Coakley D, Walsh J.B, Lawlor B.A. Screening for dementia in an Irish community sample using MMSE: a comparison of norm-adjusted versus fixed cut-points. *Int J Geriatr Psychiatry* 2005:20(4):371-6.

Eustace A, Bruce I, Coen R, Cunningham C, Walsh C, Walsh J.B, Coakley D, Lawlor B.A. Behavioural disturbance triggers recognition of dementia by family informants. *Int J Geriatr Psychiatry*. 2006. In press

Fallon N, Kirby C, Casey M, Fan C, Kennedy B, Maher N, Steen G, Thornton E, Walsh J.B. Risk factors for falls in patients with Colles fracture. *Irish J Med Sc* 2006: 175(3):S2:13

Fan CW, Tan KM, Coakley D, Walsh J.B, Cunningham C. Compliance of external hip protector use amongst elderly day hospital attenders. *Irish Journal of Medical Science* 2005:177(1):1-6.

Fan CW, Cunningham C.J. Non Pharmacological Treatment Of Orthostatic Hypotension in the elderly. *Reviews in Clinical Gerontology* 2005 15: 165–173

Fan CW, Cunningham C.J. Falls in the elderly - assessment and management. *The Irish Journal of Clinical Medicine* 2004 November:34(10):35-40.

Fan CW, Coakley D, Walsh J.B, Cunningham C.J. Postal questionnaire survey: the use of sleeping with the head of the bed tilted upright for treatment of orthostatic hypotension in clinical practice. *Age Ageing*. 2006:35(5):529-32.

Healy M, McCartan D, Walsh J.B, Casey M.C. Recombinant PTH therapy: early effects on urinary calcium and its relationship to bone turnover. *Ann Clin Biochem* 2006 43 (Supplement 1) 110

Horgan N.F, Cunningham C.J, Coakley D, Walsh J.B, O'Regan M, Finn AM. The Stroke Activity Scale: Results of a validity study. *Disabil Rehabil*. 2006:28(15):937-41.

Horgan NF, Cunningham C.J, Coakley D, Walsh J.B, O'Neill D, O'Regan M, Finn AM, McCormack P. Validating the Orpington Prognostic Score in an Irish in-patient stroke population. *Ir Med J* 2005:98(6):172, 174-5.

Irish M, Coen R.F, Lawlor B.A, O'Mara S.M, (2006). Introducing the EAMI – Validation of a new test measure of contextually rich episodic autobiographical memories in the elderly and early Alzheimer's Disease. Supplement of the Journal of Cognitive Neuroscience: 143. [Poster presentation, Cognitive Neuroscience Society Annual Meeting, San Francisco, April, 2006].

Irish M, Coen R.F, Lawlor B.A, O'Mara S.M (2006). Investigating episodic retrieval of autobiographical memories using the Episodic Autobiographical Memory Interview in Young and Elderly Healthy Individuals, and Patients with Mild Alzheimer's Disease. Irish Journal of Medical Science, 175 (3, Supplement 2): 61. [Poster Presentation [RC], Irish Gerontological Society Annual Meeting, Galway, September, 2006]

Irish M, Coen R.F, Lawlor B.A, O'Mara S.M (2006). Assessment of Episodic Autobiographical Memory in Healthy Ageing and Mild Alzheimer's Disease. The Irish Psychologist, 33(3): 61. [Platform presentation, Psychological Society of Ireland Annual Meeting, Galway, November, 2006]

Irish M, Cunningham C.J, Walsh J.B, Coakley D, Lawlor B.A, Robertson I.H, Coen R.F. Investigating the Enhancing Effect of Music on Autobiographical Memory in Mild Alzheimer's Disease. Dement Geriatr Cogn Disord. 2006;22(1):108-120.

Kara M, Cronin H, Walsh J.B, Casey M.C. The early effects of recombinant PTH therapy on urinary calcium and its relationship to baseline bone biochemistry. Age and Ageing 2006 35:S3: 12

Kennedy B, Caffrey N, Healy M, Fallon N, Walsh J.B, Casey M.C. Changes in 25 (OH) D and 24 hour urinary calcium during the initial phase of treatment with recombinant parathyroid hormone (1- 34) Irish J Med Sc 2006: 175(3):S2:13

Lynch C.A, Walsh C, Blanco A, Moran, M, Coen R.F, Walsh J.B, Lawlor B.A. (2006). The Clinical Dementia Rating Sum of Box score in Mild Dementia. Dementia and Geriatric Cognitive Disorders, 21(1), 40-43.

Lynch C.A, Coen R.F, Walsh C, Cullen B, Evans I, Hawi Z, Corvin A, Walsh J.B, Gill M, Lawlor B.A. Neuropsychological Phenotypes in Late-Onset Alzheimer's Disease associated with Apolipoprotein E (ApoE) Genotype. Submitted to American Psychiatric Association Annual Conference 2007.

Maher N, Steen G, Fallon N, Kirby C, Walsh J.B, Casey M. Comparison of calcaneal ultrasound with standard DXA parameters to identify patients at risk of second hip fracture. Irish J Med Sc 2006: 175(3):S2:12

O'Keefe F, Murray B, Coen R.F, Dockree P, Bellgrove M, Garavan H, Lynch T, Robertson I. Loss of insight in Frontotemporal Dementia, Corticobasal Degeneration, and Progressive Supranuclear Palsy. Brain (in press)

Talbot A, Bruce I, Cunningham C.J, Coen R.F, Lawlor B.A, Coakley D, Walsh J.B, O'Neill D. Driving cessation in patients attending a memory clinic. *Age Ageing* 2005;34(4):363-8.

Walsh J. B, Cleall S, Fahrleitner A, Karras D, Langdahl B, Lems W, Junggren AL, Marin F, Rajzbaum G, Tynan A.J. Quality of Life and Back Pain in the European Forsteo Observational Study – EFOS *Journal of Bone and Mineral Research*, 2006;21:Suppl Su392