

Annual Report 2013



**IMPACT Strategic Research Centre
(Innovation in Mental and Physical Health and Clinical Treatment)**

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The IMPACT SRC team

Forewords

2013 saw continued growth and productivity for the unit. This success was recognised by Deakin in according official status as a strategic research centre within Deakin, and Professor Michael Berk was recognised by being awarded the title of Alfred Deakin Professor, which is the highest honour a university can bestow upon a staff member. In 2013 Professor Berk was awarded an NHMRC Senior Principle Research Fellowship the first for Deakin University. This fellowship will commence in 2014. I commend the team for their excellent discovery, clinical and community based research and wish them every success in 2014.

Professor Lee Astheimer

Deputy Vice Chancellor, Research
Deakin University



The IMPACT (Innovation in Mental and Physical Health and Clinical Treatment) SRC has had another successful year. The Unit produces extremely high quality research that is acknowledged as world leading. As Barwon Health increasingly becomes a university aligned academic health service, the role that Prof Michael Berk and his team will be seen as an exemplar to Barwon Health. On behalf of Barwon Health, thank you for your contribution.

Professor David Ashbridge

Chief Executive
Barwon Health



The high quality research completed by Professor Berk and the team allows The Geelong Clinic to participate in the area of clinical psychiatry research. Access to the team has allowed The Geelong Clinic to provide advanced trainees from Barwon Health the ability to rotate through the hospital, under supervision. This allows the trainees to gain valuable experience in assessment and treatment of clients with psychiatric disorders such as eating disorders, depression, anxiety, posttraumatic stress disorder, borderline personality disorder, bipolar disorder and addictions. We look forward to continuing the positive relationship between clinical and research and private/public mental health.

Mr Andrew Currie

State Manager Hospitals
VIC/TAS/WA
Healthscope Ltd



Introduction by Professor Michael Berk



Professor Michael Berk

2013 was another productive year for the IMPACT Strategic Research Centre. The quality and quantity of our research output continues to grow with 118 publications in 2013 including a number of high impact publications in the top journals in the field, including *Molecular Psychiatry*, *The American Journal of Psychiatry* and *The British Journal of Psychiatry*.

A number of members of the team had particular successes. Ajeet Singh was awarded a Pfizer NSR neuroscience grant and a travel award from the XXIst World Congress on Psychiatric Genetics, Lesley Berk was awarded an Alfred Deakin post-doctoral scholarship, Sharon Brennan was awarded Annual President's Poster Award for most outstanding abstract at the American Society for Bone and Mineral Research (2013) and a Scientists' Research Prize for most outstanding research presentation at the Annual Geelong Research Network research week, Adrienne O'Neil was awarded an NHMRC early career fellowship, Natalie Hyde obtained an APA award, Shae Quirk obtained an NHMRC postgraduate scholarship, Lana Williams was successful in achieving an NHMRC career development fellowship and I was given an NHMRC Senior Principal Research fellowship. Lana Williams also won the Smart Geelong "Living with a disability" award. Felice Jacka was the initiated and became the inaugural Chair of the International Society for Nutritional Psychiatry research as well as the Alliance for the Prevention of Mental Disorders. Julie Pasco was appointed to the level of full Professor.

The SRC continues to develop strong collaborative links with other health service providers including Healthscope, research centres within Deakin including PRADA, Centre for Molecular and Medical Research, Centre for Mental Health and Wellbeing and Deakin Population Health, and multiple international partners. We would like to thank Deakin University and Barwon Health for their continuing support of the unit.

The Epi-Centre for Healthy Ageing, led by Professor Julie Pasco



Prof Julie Pasco

This year the Epi-Centre for Healthy Ageing (ECHA) amalgamated with the Psychiatric Health SRC to form the IMPACT SRC. This newly-branded IMPACT SRC has moved forward into 2013 with a fresh image and a broad program of research that incorporates aspects of both physical and mental health. The ECHA conducts population-based research into musculoskeletal and metabolic disorders, and the nexus between physical and mental health. At the heart of the Unit lies the Geelong Osteoporosis Study (GOS) which is complemented by the Geelong Osteoporosis Study Fracture Grid (GOS-FracGrid), Social Epidemiology, Psychiatric Epidemiology and the Vitamin D in Pregnancy (VIP) study.

The Geelong Osteoporosis Study (GOS) is a prospective cohort study, which was originally designed to describe the health burden of osteoporosis and identify risk factors for fragility fracture, and has evolved over time to study a broad range of disorders. The study is set in the Barwon

Statistical Division. Over the past two decades the GOS has prospectively documented comprehensive clinical and environmental data for large contemporary cohorts of young, middle-aged and elderly men and women, producing a unique dataset for investigating aspects of both physical and mental health. The GOS comprises several components: GOS-musculoskeletal research, GOS-metabolic research, GOS-social determinants of health, GOS-mental health and GOS-infectious diseases.

The GOS-FracGrid is an ongoing, comprehensive repository that documents incident fractures as they occur in the Barwon Statistical Division. For nearly two decades this unique dataset has been recording fracture case details according to fracture site, age, sex and date. Data from the GOS-FracGrid provide a unique evidence base for describing the epidemiology of fractures and for monitoring changes in patterns of fracture for an entire population.



The VIP study started in 2002 when pregnant women were recruited from Geelong Hospital's antenatal clinic and provided blood samples for vitamin D assessment. Their babies were measured at birth and at age one. The mother-child pairs are now being tested again to see if maternal vitamin D status during pregnancy impacts on muscle and bone growth, fat distribution and behaviour in the children at age 10.

Bipolar disorder research

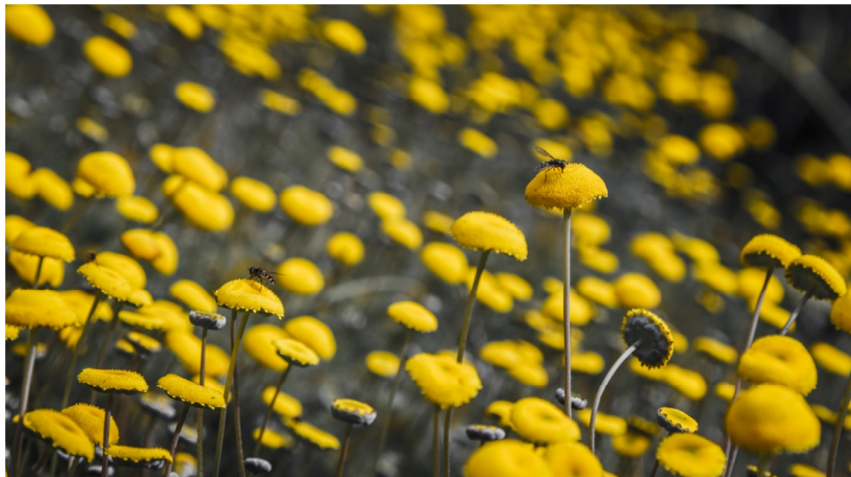
Depression and bipolar disorder research are a focus within the IMPACT Strategic Research Centre.

We are attempting to answer the question of which potential mood stabilising agents have the best neuroprotective properties after a first-episode of mania. In the study, individuals who have had a first-episode of mania were randomised to receive either lithium or quetiapine and they were followed up for a year using brain imaging and neuropsychology to determine which agent best protects the brain. The study was complete by the end of 2013, and analysis is underway.

A further focus is on carer-burden in bipolar disorder. A Delphi study to develop guidelines for carers of people with bipolar disorder, and an intervention based on the results of the study has been developed. A study investigating altered perceptions of time in patients with bipolar disorder has been completed. In conjunction with the Geelong Osteoporosis Study, we are currently recruiting for the Bipolar Health and Lifestyle Study. Participants with Bipolar Disorder from the community will be studied to understand associated health and lifestyle factors and underlying mechanisms in the disorder. Findings may be used to inform public policy and health service delivery, leading to improved treatment and health outcomes for people with bipolar disorder.

Our oxidative biology program has a major focus on bipolar disorder. Having shown that N-acetylcysteine (NAC) effectively treats the symptoms of depression in bipolar disorder, we have just completed a study showing that it reduces depression in unipolar disorder as well. As part of this suite of clinical trials, we are also examining biomarkers including measures of inflammation and oxidative stress as well as neuroimaging in conjunction with our research partners led by Professor Gin Malhi at the University of Sydney. We have just commenced a large NHMRC and CRC funded project to definitively study the efficacy of NAC in bipolar depression, as well as a cocktail of mitochondrially active agents. The latter study is a proof of concept trial of the notion that there is a primary abnormality in mitochondrial energy generation in bipolar disorder.

Together with Dr Sue Tye from the Mayo Clinic, we are developing a novel animal model of bipolar disorder using deep brain stimulation, to examine changes in energy generation in models of both depression and mania. We are developing an analogous drug discovery program for bipolar disorder with Professor Ken Walder,



who has developed a drug discovery program for diabetes by looking at the gene expression signature of existing agents, and finding new potential treatments that target this gene expression signature.

Drug safety



A/Prof Seetal Dodd

The large range of drugs available for the treatment of mental illness have helped improve the lives of thousands, perhaps even millions of people. These drugs have helped people manage their illnesses, prevented or reduced the recurrence of illness and controlled symptoms of illness. Although people with mental health difficulties have benefited greatly from modern drug treatments, these treatments are also known to have risks. Researchers at IMPACT SRC work to understand and reduce the risks and to improve the risk to benefit ratios for drug treatment of mental illness.

As well as our ongoing studies investigating treatment emergent adverse events, this year we have increased our efforts to increase the benefits side of the risk/benefit equation, by looking at how our existing treatments can be used in individualised treatment plans so as to maximise their efficacy. Moreover, we have commenced work evaluating the neuroprotective properties of conventional and novel treatments. These studies may provide a new treatment objective for people with mental illness, preventing the worsening course of the illness rather than simply reacting to the symptoms of the illness. This new approach to treatment in mental health may ultimately lead to better mental health outcomes and better drug safety outcomes. Chronic, treatment resistant stages of illness are typically associated with higher doses of treatment and drug combinations. If this can be averted through our neuroprotective strategies then drug safety will be improved. In 2013 we have published an important paper on neuroprotective agents in 'Progress in Neuro-Psychopharmacology & Biological Psychiatry', conducted a 'Brainstorming' session on neuroprotection at the International Conference on Bipolar Disorders in Miami Beach, Florida, and presented neuroprotection data in a symposium at the Australasian Society for Psychiatric Research annual conference. We have also published three papers on oxidative, nitrosative and inflammatory stress, which is core to the topic of neuroprotection.

Our work on the adverse effects of clozapine treatment and of the effects on bone health of SSRI and antipsychotic treatment has continued in 2013, resulting in a publication in *Biological Psychiatry*.

We have conducted research using adverse event data from clinical trials. This research has given us a better understanding of the placebo and nocebo effect, which are important confounders when investigating adverse events.

We have been involved in the publication of guidelines, which assist clinicians to make well-informed and balanced treatment decisions. These include publications regarding the safe use of drugs for the evidence-based treatment of various mental illnesses as well as publications about safe treatments in special populations, such as pregnant and breast-feeding women.

Highlighting our role in this area, Associate Professor Seetal Dodd currently holds the position of Editor-in-Chief of the scientific journal *Current Drug Safety*.

Prediction of response to antidepressants – clinical & genetic factors

Genetically guided prescribing (pharmacogenetics) has scope to match patients with depression to effective tolerable medication. An international multi-centre candidate gene association study examining the role of polymorphisms of the blood brain barrier (BBB) efflux pump P-glycoprotein (ABCB1), the noradrenaline transporter (NET) gene, along with psychomotor signs and history of child abuse were studied for remission predictive utility. A total of 113 subjects were enrolled in the study that contributed towards a doctorate degree. The study demonstrated that the dose of the antidepressant escitalopram needed to remit correlates with patient ABCB1 genotype – a treatment biomarker with translational potential. Additionally, a NET polymorphism was associated to greater susceptibility to ongoing mental health impacts from child abuse. Differential efficacy of antidepressants for psychomotor symptoms was also demonstrated. These results have been published in peer reviewed journals. Dr Singh was an invited speaker at the 2013 Royal Australian & New Zealand College of Psychiatrists Congress in Sydney to present these findings. He has been awarded a Pfizer NSR neuroscience grant to enable post-doctoral research in BBB pharmacogenetics, and is a chief investigator in a current NHMRC grant application. Dr Singh has also published research on Transcranial Magnetic Simulation (TMS), examining differential efficacy of different stimulation modalities in major depression. He is currently examining the role of early somnolence during TMS as a predictor of subsequent efficacy. Dr Singh plans to continue as an academic private psychiatrist and remains extensively involved in medical student teaching.



Dr Ajeet Singh

www.bipolarcaregivers.org



*Dr Lesley Berk Post-Doc
Research Fellow
and Melanie Ashton,
Research Assistant*

Lesley Berk was awarded her PhD on 'The development and evaluation of guidelines and an information website for adult caregivers of adults with bipolar disorder' in March 2013. The website was awarded a top 10 ranking by Good Therapy Australia. She has been working on the results of psychosocial scales that were added to the Bipolar Comprehensive Outcome Study, a two year observational study. She is also involved in writing manuscripts and funding applications in the area of affective disorders, and has formed collaborations on potential projects with academics at Mount Sinai Hospital in New York and University of British Columbia. Lesley has also been assisting with the project in our unit involving a randomized controlled trial of minocycline in the adjunctive treatment of depression. The publishers, Allen and Unwin have invited her to write a second edition of the book 'Living with Bipolar Disorder - a guide to understanding and managing the disorder' and she has been awarded an Alfred Deakin Postdoctoral Research Fellowship to commence in 2014.

Novel therapies

Our SRC is currently focusing on novel targets to treat the symptoms of psychiatric disorders. We have a multitude of approaches ranging from basic science through to clinical trials. The targets of our novel therapies centre on alterations in oxidative biology, inflammation, neurogenesis and mitochondrial dysfunction, factors that are believed to be important in the pathology of many psychiatric illnesses.

We have recently completed a trial involving NAC in the treatment of unipolar (clinical) depression. This trial involved three months of NAC treatment or placebo in people with moderate to severe depression. The study showed benefits of NAC on some symptoms of depression. Furthermore, there seemed to be more benefit for those with more severe illness. These findings are published in the *Journal of Clinical Psychiatry*. As part of this study, a proportion of the participants were also involved in a brain imaging (magnetic resonance spectroscopy) study. This study looked at brain chemistry to determine if we could see direct biological markers reflecting clinical benefits.



Dr Olivia Dean

We have commenced a new study that will extend our NAC work by incorporating other nutraceuticals, believed to alter mitochondrial function to our NAC trials. The new trial will include three arms, a placebo arm, a NAC-alone arm and a “mitochondrial cocktail” combination arm. There is mounting evidence to suggest that the symptoms of bipolar disorder are partially driven by changes in our energy powerhouses, the mitochondria. By adding-on nutraceuticals that target mitochondrial function, we are hoping that the symptoms of bipolar disorder may be improved. Additionally, a PhD candidate, Kristi-Ann Villagonzalo is due to complete a study investigating the use of NAC in children with autism. We are also hoping to embark on a new study investigating NAC for post-anaesthetic cognitive decline in collaboration with a team at Barwon Health. We are additionally working with collaborators at the University of Melbourne, investigating NAC as a treatment for obsessive-compulsive disorder.



*Dr Alyna Turner, Research Fellow
Dr Yuval Samuni, Research Fellow*

There is evidence that inflammation may play a major role in multiple psychiatric disorders. Based on this, we have commenced a study investigating the potential benefits of statins (cholesterol controlling medications) and aspirin treatment in youth depression. The premise behind the study is that statins and aspirin are both anti-inflammatory, and by reducing inflammation we can reduce the symptoms experienced by individuals.

We are also investigating an antibiotic, minocycline, which also has anti-inflammatory properties. We have commenced a trial in unipolar (clinical) depression and are hoping to start a study in Portugal investigating minocycline as an adjunctive therapy for bipolar disorder. The SRC currently has a register open to anyone who has a psychiatric disorder and would be

interested in taking part in our studies. If you would like more information regarding the register, please contact Dr Olivia Dean – (03) 4215 3300.

Psychiatric disorders and comorbidity

Mood and anxiety disorders impose huge costs, both on the individual and the community, yet we have an incomplete understanding of their impact on lifestyle, social and in particular medical factors. Given the high prevalence and associated public health-care costs of common physical illnesses, such as cardiovascular disease, type 2 diabetes, obesity, osteoporosis, and fragility fracture worldwide, it is important to investigate and better understand the association of these illnesses with mental health issues. Less is known about whether personality disorders too are associated. Understanding the association between these factors and psychiatry is vital to successful health promotion, health care delivery, and disease management.

Over the past years, we have been developing a program of research investigating medical, lifestyle and social outcomes associated with mood, anxiety and personality disorders, within an epidemiological context. This research has been conducted in conjunction with the Geelong Osteoporosis Study (GOS), a large epidemiological study involving a population-based sample of over 2000 women and men randomly selected from electoral rolls for the region (Barwon Statistical Division). The GOS was originally developed to investigate predictors and consequences of osteoporosis, but expanded nearly a decade ago to examine mental illness and other common diseases. At the 10 year follow up each of the participants underwent a structured clinical interview (SCID-I/NP) and are currently being reinterviewed (SCID-I and II) at the 15 year follow up. This research program has been replicated in more than 1000 men from the Barwon region, adding further strength to this large-scale project. Dr Williams now heads this component of the study known as *GOS-Mental Health*.



Dr Lana Williams

This research has revealed that approximately one in three (35%) women have experienced a mood and/or anxiety disorder. Furthermore, we found depression to be associated with reduced bone mineral density, affect bone quality and increase the risk of fracture by 60%. We were also one of the first to show that the SSRI group of antidepressants may increase the risk for osteoporosis (See section "Drug Safety" for further information regarding this program of research). Associations between mood and anxiety disorder and a range of medical conditions including osteoporosis, irritable bowel syndrome, pain and cardiovascular diseases, lifestyle factors such as smoking and physical activity and social factors such as area based socioeconomic status and quality of life have also been examined.

This program of work will generate important information that can be used to provide an insight into the interaction between physical and mental health. Also, a wide range of social, psychological and biological factors such as the presence of inflammation and/or oxidative stress are being investigated, which may explain these associations. This program of research is an invaluable resource for collaborative studies, both nationally and internationally and student projects. Existing collaborations include Nord-Trøndelag Health (HUNT) Study, Norwegian University of Science and Technology, University of Eastern Finland, Institute of Functional Genomics of Lyon, Sapienza University of Rome, University of Manitoba and Guiyang Medical University, China which allows for further investigations and replication in even larger population based studies.

Prevention of common mental disorders



A/Prof Felice Jacka

Depression and anxiety are highly prevalent conditions, and the burden they impose on individuals and the community is enormous. In our research unit we have developed a highly innovative program of research that examines how our lifestyles interact with our risk for mental health problems. This is being done with the ultimate goal of developing an evidence-based public health message for the primary prevention of these common mental disorders.

In May of 2013, a two-day 'think tank' was conducted at the Australian National University, supported by Australian Rotary Health. This symposium brought together many of the most senior mental health researchers in Australia with an interest in prevention research. This symposium resulted in the launch of a new national society, the 'Alliance for the Prevention of Mental Disorders'. The aim of this society is "To support a population health approach to the prevention of mental disorders and promotion of emotional wellbeing". Associate Professor Felice Jacka, from the IMPACT SRC, is president of this new society, while Professor Michael Berk and Dr Adrienne O'Neil act on the executive committee.

Similarly, 2013 saw the launch of the new 'International Society for Nutritional Psychiatry Research' (ISNPR). This society now represents more than 140 researchers from across the globe with an interest in the nexus between nutrition and mental health. Led by Associate Professor Felice Jacka, the ISNPR held its inaugural meeting in Tokyo, Japan in June and will hold its next meeting in Australia in 2014. 2013 also saw the publication of key studies highlighting the importance of early life exposures to mental health outcomes over the lifespan.

In October 2013 we published the results of a study undertaken with our Norwegian collaborators. This study established that what mums eat when they are pregnant, and what children eat in the first years of life, is linked to children's mental health. This is the first study in the world to show that the potential impact of early life nutrition is relevant to mental health as well as physical health outcomes in children. This understanding has important implications for population health and it is hoped that these results will strengthen the push for policy changes in relation to the food industry. This study was published in the *Journal of the American Academy of Child and Adolescent Psychiatry (JAACAP)*, which is the leading paediatric psychiatry journal worldwide.

Also with our Norwegian collaborators, we published data suggesting that tobacco smoking in adolescence increases the risk for the development of anxiety disorders in early adulthood. These findings build on previous important research from our team demonstrating an independent role for tobacco smoking in the risk for depressive illness, as well as research showing that individuals with mental disorders are less likely to recover if they are smokers. These research findings are providing important insights regarding the role that smoking may play in mental illness.

Finally, we continue to recruit participants for a world's first trial that aims to answer the important question "If I improve my diet, will my mental health improve?" As such, we need to recruit approximately 200 adults suffering from major depression. We will then examine the impact of dietary improvement on their depressive symptoms at the end of the trial period. This trial is being conducted at St Vincent's in Melbourne and Barwon Health in Geelong. For further information, people can email: diet@barwonhealth.org.au or call Melanie on (03) 4215 3325.

Acting on the social determinants of chronic disease and healthcare utilisation



Dr Sharon Brennan

Dr Sharon Brennan, Research Fellow funded by the National Health and Medical Research Council (NHMRC of Australia), is Head of the Social Epidemiology Research Program, in the IMPACT SRC, School of Medicine, Deakin University. She is also Associate Editor for BMC Musculoskeletal Disorders and holds a conjoint position as Research Fellow with the Australian Institute for Musculoskeletal Sciences.

The Social Epidemiology Research Program places health equity at the forefront of Geelong-based knowledge generation and dissemination, interventions and policy discussions; information that has significant implications for a healthier Geelong. This program incorporates a large body of work to address significant gaps in current knowledge regarding social disadvantage and non-communicable, chronic diseases at different stages of pre-disease, and disease diagnosis and treatment phases, and also appropriate points and avenues for intervention, focusing on the Barwon region population, but ultimately informing Australian health policy and practice.

Future direction for this group includes a focus on: (i) the engagement of disadvantaged individuals in the promotion of preventive health messages, (ii) developing processes so as the voices of disadvantaged individuals are represented in projects aimed at reducing less healthy lifestyles, (iii) an increase in multi-level analyses that disentangle the random and fixed effects of social determinants at the individual, household, neighbourhood and policy levels on chronic diseases, (iv) a greater focus on partnership projects with social and health policy representatives, (v) a strategic focus on knowledge dissemination and implementation science, and (vi) implementation of a chronic disease prevention mechanism based on Canadian expertise.

Over the last 12 months Sharon has been awarded the Annual President's Poster Award for most outstanding abstract at the American Society for Bone and Mineral Research (2013), a Scientists' Research Prize for most outstanding research presentation at the Annual Geelong Research Network research week (2013), a Dyason Fellowship (2012), and the Early Investigator Researcher of the Year Award, from the Smart Geelong Research Network (2012). She provided comment on a number of (inter)national documents including the 2012 Rio Declaration, developed by the WHO, the 2013 NHMRC Research Translation Faculty focus on arthritis/musculoskeletal conditions, and the 2012 update to the Health Inequities Policy for the Public Health Association of Australia, and was involved in attracting more than \$1.3million in project funding.

International collaboration with Canada has continued, which has seen a successful array of publications and research findings concerning the bone health of Canadian Indigenous vs. non-Indigenous persons, post-fracture care and mortality, and the role played by social and ethnic disadvantage on fracture risk. A key finding from this collaboration has been the finding that the Canadian-specific fracture prediction tool, developed by the World Health Organisation (WHO), performs adequately across the socioeconomic continuum.

Novel and contemporary approaches to chronic disease management

Chronic diseases including cardiovascular disease (CVD), diabetes mellitus and major depression are often experienced concurrently. In fact, depression is now a well-established risk factor for CVD, and conversely, is highly prevalent in these patient populations. This year has seen Dr Adrienne O'Neil commence a National Health and Medical Research Council Early Career Fellowship which investigates these associations, specifically: (i) the primary and secondary prevention of these chronic diseases and (ii) developing novel and innovative treatments for these conditions.

A key part of the former has been the award of funding from the Deakin University Central Research Grants Scheme to develop a new risk equation which includes depression for predicting cardiovascular risk over a ten year period. Dr O'Neil will travel to Stanford University and University of California-Berkeley in 2014 in order to complete this project.

A major component of the latter has been the completion of the "MoodCare" randomised controlled trial with colleagues at Monash University. This study aimed to determine the efficacy and feasibility of a tele-health intervention for patients with depression following a heart attack. We found this program to be efficacious for improving depression and mental health functioning over 6 months, particularly those with a history of major depression. These findings will be published in the *Annals of Behavioral Medicine* in 2014.



Dr Adrienne O'Neil

2013 saw Dr O'Neil travel to the US to present at the Society of Behavioral Medicine as part of a symposium on the topic of: "Using technology to deliver interventions to improve health: How 'soft touch' is 'high tech'?" This coincided with a visit to Stanford University's Department of Psychiatry to meet with research staff and health care technology developers "Thrive On", in Palo Alto. June saw the IMPACT SRC well represented at both the World Congress of Biological Psychiatry conference, Kyoto, Japan and the inaugural International Society of Nutrition in Psychiatric Research conference in Tokyo, Japan. December saw a large IMPACT SRC presence at the Australasian Society of Psychiatric Research in Melbourne, where Dr O'Neil was awarded the AFFIRM Early Career Researcher Award.

These and other research activities have forged key collaborations with both domestic and international institutions including Imperial College London and Guiyang Medical University. Notably, Dr O'Neil was invited to contribute to The National Heart Foundation's consensus statement on psychosocial risk factors for CVD which includes recommendations for clinicians regarding depression assessment and treatment.

Late 2013 saw Drs O'Neil and Dean attend an Emerging Leaders Forum hosted by Deakin University for early-mid career researchers, which aimed to enhance capacity building. In addition, the inaugural IMPACT SRC Consumer Advisory committee was launched; chaired by Dr O'Neil. This committee meets biannually to draw on the advice and experiences of health care consumers in the local area to contribute to existing and prospective research studies within the Centre. In November, Dr O'Neil chaired the Barwon Health-Deakin University Grants Review Meeting attended by consumers and researchers from the local area that provided key feedback on prospective grant proposals for submission in 2014.

Determining the risk of fracture in the Australian population



Dr Kara Holloway

Dr Kara Holloway, Postdoctoral Research Fellow, recently joined the IMPACT SRC, School of Medicine, Deakin University in July 2013. She completed a Postdoctoral qualification at The University of Adelaide in May 2013 on the history of tuberculosis, with a focus on skeletal and epidemiological methodologies. She is also an Editorial Associate for the Journal of Comparative Human Biology.

Dr Holloway has started a project assessing the rates of prevalent fracture in a representative sample of the Australian population by drawing information from the ongoing Geelong Osteoporosis Study (GOS). This project aims to estimate the morbidity of fractures during the entire life course and provide important and useful outcomes for fracture treatment and prevention. This type of analysis has not been done previously and will make an important contribution to the field. Another project, involving the measurement of bone degradation biomarkers in the serum of GOS participants, has also been initiated. The aim of this project is to estimate fracture risks in relation to the levels of measured bone degradation.

Before joining the IMPACT SRC team, Kara received a number of awards including a Dean's Commendation for Doctoral Thesis Excellence. Her previous work has been funded by a number of grants including the Australian Postgraduate Award (2010-2012), the Mäxi Foundation Zürich, the Dorothy and Walter Duncan Trust Award and the Playford Trust Memorial Scholarship. Funding was also received from The University of Adelaide through a Research Abroad Scholarship, Faculty of Health Sciences Postgraduate Travelling Fellowship and a Postgraduate Allowance.

Kara has also published a number of articles in good quality, peer-reviewed journals such as the Journal of Comparative Human Biology, Advances in Anthropology, PLOS ONE, the Journal of Biosocial Science and the American Journal of Physical Anthropology. She has also presented her work at many international conferences in a wide range of countries including Hungary, Germany, the United States and Switzerland. Kara's previous research work involved collaborations with Switzerland and these will continue within her new position; further increasing the international links within the IMPACT SRC.



Our PhD Candidates



*Dr Frank Giorlando
PhD candidate*

DISSOCIATION AND CHANGES IN THE PERCEPTION OF TIME

This doctoral study aims to combine a number of research methods to better understand how the perception of time is altered in psychiatric disease. It has involved an ongoing collaboration between the Department of Clinical and Biomedical Sciences and the Department of Physiology, Development and Neuroscience at the University of Cambridge, as well as Barwon Medical Imaging. In particular, the research focuses upon changes in the perception of the "flow" of time and ordering of events.

Over the last year, a study of time perception in patients who have Bipolar Disorder was completed. Participants were asked to report the ordering of two flashed lights, we were interested in how often they reported an inverted order of the stimuli. We found that changes in participants' mood scores were related to the frequency of inverted judgements.

Our studies have shown that dissociative symptoms are common in the outpatient population and that changes in the perception of time involve alterations of activity in the frontal as well as temporal areas of the brain. We hope to understand more of how these differences relate to alterations in the perception of time.

THE IMPACT OF ACCIDENT CIRCUMSTANCE VARIABLES ON MENTAL AND PHYSICAL HEALTH OUTCOMES FOLLOWING SERIOUS MOTOR VEHICLE ACCIDENTS

Close to 300 people are killed on roads each year and another 16,000 injured require hospitalisation or treatment from allied health professionals. In addition to the tragic loss of life and disability incurred through motor vehicle accidents, the direct financial cost to the Victorian community of medical services and other compensation associated with road trauma is around \$1 billion per year. Further to this, many clients are left permanently disabled, are unable to return to work or other roles within families and communities, or continue to experience poor mental health for a time far beyond the duration of their physical injuries. Whilst the TAC maintains a largely 'no-fault' scheme, it is apparent from initial investigations, that individual client demographic and accident circumstance variables, including attributions of responsibility for the accident, may have a large effect on duration and quality of mental and physical health recovery, perceptions of service quality, and treatment costs. This study will attempt to explore this relationship within the context of existing theoretical models of post-trauma recovery processes.



*Jason Thompson
PhD candidate*

Our PhD Candidates continued...



*Sue Lauder,
PhD candidate*

MOODSWINGS 2.0 ONLINE INTERVENTION

Our research team are continuing their international collaboration with Stanford University, after successfully obtaining funding from the NIH to further evaluate one of the first online self-help programs for Bipolar Disorder called MoodSwings (www.moodswings.net.au). The MoodSwings program is completely online, it is entirely self-help, and offers adjunctive psychosocial tools and information to help manage bipolar disorder. It includes a number of core modules that cover information about bipolar disorder and strategies to assist in staying well. There are also moderated discussion boards, and follow up booster sessions. We have developed three

different versions of MoodSwings and are comparing whether there are any differences in outcomes between a discussion only version, an information version (psycho-education), and a more intensive Cognitive Behavioural Therapy (CBT) version.

A total of 300 participants will be involved in the MoodSwings trial, with 150 participants allocated to the Barwon Health site. Participants will be randomised to either interactive CBT, psychoeducation or discussion only groups. A previous randomised controlled trial of MoodSwings showed benefits of the program in relation to symptoms, functionality, quality of life and medication adherence. The interactive CBT group also showed some additional benefits on symptoms of mania. In 2013, the MoodSwings program has been extensively upgraded and re-developed. It is anticipated that a number of new features will improve the overall effectiveness and usability of the program. Recruitment for this program is expected to commence by the start of 2014.

BENEFITS OF ONLINE DISCUSSION: MOODSWINGS 2.0

Few studies have assessed the use of internet-based therapies in the treatment of bipolar disorder, and one of the first to incorporate moderated discussion boards is the MoodSwings program. While a previous trial of the MoodSwings program (MoodSwings 1.0) included discussion boards, each board was only allocated a maximum of 6 participants, resulting in relatively low levels of active participation. This study will examine the role of discussion board participation within the upgraded MoodSwings 2.0 program. Specifically, it will explore ways discussion board participation could mediate participant outcomes, focussing specifically on self-reported social support. This study will also look at factors that may influence active versus passive participation, such as motivation for treatment.

This study is a 3-arm randomized controlled trial with a recruitment target of 300. All participants will have access to one of three discussion boards (boards are allocated per treatment arm), with a maximum of 100 participants allocated to each discussion board. Active discussion board participation will be measured by the number of posts submitted per user, while passive participation will be assessed using page views and duration of page views. The results from this project will help us to better understand the potential benefits of online therapy for people with bipolar disorder, and specifically what role online discussion forums play in improving outcomes, which will inform future programs.



*Emma Gliddon
PhD candidate*

Our PhD Candidates continued...



Shae Quirk
PhD candidate

PERSONALITY DISORDERS AND PERSONALITY DISORDER FEATURES IN THE COMMUNITY: THE ASSOCIATION WITH LIFESTYLE FACTORS, PHYSICAL COMORBIDITY AND HEALTH SERVICE UTILISATION

Personality disorders are serious psychiatric conditions with debilitating outcomes in public health domains. They are highly prevalent in clinical populations; however the prevalence and correlates of personality disorders in Australia are largely unknown. Despite it being well known that psychiatric disorders are linked to physical illness, the study of personality disorders and physical comorbidities has been neglected. It is also unclear what impact personality disorders and associated physical comorbidities have on the utilization of mental and health services in Australia. This project will link robust epidemiological data from The Geelong Osteoporosis Study to national registries such as Medicare Australia, to estimate the prevalence of personality disorders in the community, physical comorbidities from common and chronic disease groups and health service utilization. It is intended that the data from this research will provide a

context to guiding clinical treatment and determining whether health screening for individuals with personality disorders is warranted.

LINKS BETWEEN ANXIETY AND SMOKING

Anxiety disorders (Ads) and cigarette smoking commonly occur together. Given the widely known impact of cigarette smoking as a risk factor for the development of other health issues (e.g. cardiovascular disease, lung disease etc.), it is prudent to assess the impact of smoking on the development of anxiety disorders. This project aimed to assess the association between cigarette smoking and anxiety disorder development, with a focus on how smoking may affect the expression of anxiety in the community. The project has taken data from 3 different population based studies: The Geelong Osteoporosis Study, the Tracing Opportunities and Problems in Childhood and Adolescence (TOPP) Study and the Norwegian Mother and Child Cohort (MoBA). In addition, the project has also incorporated a review of the literature to ascertain what particular biological pathways may underpin any observed effects.



Dr Steven Moylan
PhD candidate

To date, the project has led to 3 publications in journals BMC Medicine, PLOS ONE and Brain & Behavior, with a 4th publication currently under review. The results so far have demonstrated a robust association between smoking and the later development of anxiety, particularly when exposure occurs during rapid developmental phases such as gestation and adolescence. It is predicted the project will near completion in early 2014. This project will provide new insights into the development of normal and pathological anxiety throughout the developmental periods, and how cigarette smoking may interfere with this process. These insights could be utilised in anti-smoking campaigns, and also, as a template for further understanding of what influences the development of anxiety disorders.

Our PhD Candidates continued...



*Amie Hayley
PhD candidate*

CLINICAL AND EPIDEMIOLOGICAL STUDIES OF SLEEP

Disruptions to the sleep/wake cycle are recognized to have a variety of negative effects to both physiological and psychological systems. Excessive Daytime Sleepiness (EDS) constitutes a common complaint among patients attending sleep clinics, and epidemiological research has suggested that up to 12-20% of the general population experience these symptoms. To date, however, there is a paucity of information available investigating the impact of excessive daytime sleepiness and associated lifestyle and health factors in a representative group of Australian adults. Our research progress within this area has been significant, resulting in two accepted manuscript publications, one manuscript currently under review, and several awaiting submission. I have also co-authored two original manuscripts (one accepted, one to be submitted). In addition, I have attended 3 conferences in the past year to present these findings. I attended the

Australasian Sleep Association Annual Scientific Meeting in October 2013 as part of the New Investigator Award Plenary Session, and presented my recent research focussing on EDS and body composition among women. I was also involved in a media interview with Chanel 9 news discussing this topic.

This year will see me attending and presenting original research at the European Sleep Research Society (ESRS) annual scientific meeting in Tallinn, Estonia. In addition, I plan to attend a number of local scientific conferences to present research.

GESTATIONAL VITAMIN D AND DEVELOPMENT IN OFFSPRING

A significant number of Australian women, including those of reproductive age, have insufficient vitamin D levels. Gestational vitamin D insufficiency is a cause for concern, not only for the maternal health, but because it also exposes the offspring to insufficiency during potentially critical stages of development. It is known that deficiency in infancy and childhood affects bone health and muscle function. It is thus an important public health issue to determine whether gestational vitamin D levels impact upon musculoskeletal and other areas of health in the offspring. This study will follow up on a birth cohort at ages 9-11. Using measurements such as Dual energy x-ray absorptiometry, peripheral quantitative computed tomography and spirometry we will investigate the relationship between gestational vitamin D and a range of childhood health outcomes. This study will act to inform the growing policy debate regarding vitamin D supplementation and sun exposure through the contribution of novel information and assist with developing an evidence-based healthcare approach to vitamin D nutrition during pregnancy.



*Natalie Hyde
PhD candidate*

Our PhD Candidates continued...

REDOX BIOLOGY AND AUTISM

This study aims to investigate the antioxidant precursor, N-acetylcysteine (NAC) as a treatment for children with autism. Autism is a pervasive developmental disorder, comprising impairments in communication and social interaction, as well as repetitive or stereotyped behaviours or interests. Recent evidence has shown children with autism to have imbalances in their antioxidant defences, resulting in oxidative stress and cellular damage. It has been shown that the primary antioxidant in the brain, glutathione, is decreased in these children. This study aims to increase the amount of available glutathione by administering NAC. The double blind, randomised trial is almost complete, with a total of 103 children taking part, with half receiving the NAC treatment and the other half receiving a matched placebo. The results of this trial will be available in early 2014.



*Kristi-Ann Villagonzalo
PhD candidate*



*Rothanthi Daglas
PhD candidate*

A COMPARISON OF NEUROCOGNITIVE FUNCTIONING IN FIRST EPISODE MANIA PATIENTS TREATED WITH QUETIAPINE VS. LITHIUM: A 12 MONTH FOLLOW UP

The notion of complete inter-episodic recovery in bipolar disorder has been challenged in recent years. Evidence has indicated that cognitive impairments exist during both the acute and euthymic episodes of illness. However, the cognitive functioning of individuals during the early stages of illness remains under investigated. The usual treatment for mania is a combination of lithium and antipsychotics. The purpose of this study is to increase our understanding of the effectiveness of lithium and the atypical antipsychotic quetiapine on cognitive changes caused by the early stages of the disease process. A total of 61 participants who had experienced a first treated manic episode were involved in this study. All participants were aged between 15-25 years and were recruited from Orygen Youth Health and Southern Health sites. After the

stabilisation of the acute episode (on the combination of quetiapine and lithium), the participants were randomised to continue either quetiapine or lithium monotherapy. Neuropsychological tests were performed at baseline (within a week of commencing monotherapy), at month 3 and at month 12 follow-up. An additional 30 control participants within the same age group and estimated IQ score (WTAR) range were also recruited, with neuropsychological testing conducted at baseline and month 12 follow-up for comparison. Data analyses are currently being conducted.

Our PhD Candidates continued...



Joanna Dipnall
PhD candidate

THE USE OF DATA MINING TECHNIQUES TO IDENTIFY MULTIPLE RISK FACTORS OF DEPRESSION AND ANXIETY IN POPULATION BASED HEALTH DATA

In Australia, depressive and anxiety disorders are distressingly common, affecting people at younger and younger ages seemingly. The impact of these psychological disorders on the individual, and society, is far-reaching, impacting detrimentally on psychological, social and economic elements of everyday life. The rise of the digital world since its explosion during the 1980's has meant the ability to analyse a large number of records, with hundreds of variables is now viable. For example, to better identify and profile key customer segments, industries, such as banking, finance and marketing have harnessed the increased computing power for application of data mining and machine learning algorithms to large data sets. However, the area of mental health research has yet to fully capitalize on these rich mining techniques.

The aim of this research study is to gain a greater understanding of the contribution of a multitude of behavioural (e.g. lifestyle) and biological (e.g. clinical) risk factors associated with depressive and anxiety disorders in order to aid in the development of novel preventative and treatment strategies. Patterns of data from the Geelong Osteoporosis Study (GOS), a large and comprehensive study of Australian men and women, spanning 15 years, is used to harness the benefits of data mining and machine learning techniques to examine the associations and interactions between key risk factors. This will afford us a greater understanding of the complex causes of depression and anxiety in the community and inform novel strategies to combat these disorders.

ANTECEDENTS OF AGED CARE SERVICE UTILISATION IN A SAMPLE OF OLDER AUSTRALIANS: PROSPECTIVE DATA LINKAGE USING GOVERNMENT ADMINISTRATIVE RECORDS.

Disruptions to the sleep/wake cycle are recognized to have a variety of negative effects to both physiological and psychological systems. Excessive Daytime Sleepiness (EDS) constitutes a common complaint among patients attending sleep clinics, and epidemiological research has suggested that up to 12-20% of the general population experience these symptoms. To date, however, there is a paucity of information available investigating the impact of excessive daytime sleepiness and associated lifestyle and health factors in a representative group of Australian adults. Our research progress within this area has been significant, resulting in two accepted manuscript publications, one manuscript currently under review, and several awaiting submission. I have also co-authored two original manuscripts (one accepted, one to be submitted). In addition, I have attended 3 conferences in the past year to present these findings. I attended the Australasian Sleep Association Annual Scientific Meeting in October 2013 as part of the New Investigator Award Plenary Session, and presented my recent research focussing on EDS and body composition among women. I was also involved in a media interview with Chanel 9 news discussing this topic.



Haslinda Gould
PhD candidate

This year will see me attending and presenting original research at the European Sleep Research Society (ESRS) annual scientific meeting in Tallinn, Estonia. In addition, I plan to attend a number of local scientific conferences to present research.

Our PhD Candidates continued...

UNDERSTANDING HEALTH LITERACY REGARDING PRIMARY AND SECONDARY PREVENTION OF OSTEOPOROSIS AND FRAGILITY FRACTURE IN WOMEN

Health literacy relates to the wide range of skills an individual requires to effectively manage their own health. At its most basic level health literacy refers to the ability to read and comprehend health information such as nutrition labels, public health messages and instructions for taking medications and is referred to as functional health literacy. As the concept of health literacy has developed it has grown to include interactive health literacy, which refers to the social skills required to access health care and communicate effectively with health professionals and critical health literacy which refers to the ability to critically analyse health information in order to make the most appropriate health choices.



*Sarah Hosking
PhD candidate*

There is a growing body of evidence relating health literacy to a number of different health outcomes but little is currently known about health literacy with regards to osteoporosis. As prevention is key to reducing the direct and indirect costs of osteoporosis on individuals and the community, a greater understanding of how at risk populations access and understand messages about osteoporosis prevention would help to tailor health messages and improve the effectiveness of public health initiatives and interventions.

This project aims to understand health literacy regarding primary and secondary prevention of osteoporosis and fragility fracture in women and by doing so help to inform future osteoporosis prevention initiatives.



Ongoing funding for 2013

- 1) National Health and Medical Research Council. Project Grant. APP1026307. Project Title: The Efficacy of N-acetylcysteine as an adjunctive treatment in bipolar depression: A double-blind, randomised, placebo-controlled trial. Investigators: (Chief Investigator B) – Berk M, Dean O, Cotton S, Dodd S. 2012-2014. AUD \$930,844.00 over 3 years.
- 2) National Health and Medical Research Council Project Grant. APP1027315. Project Title: Proof of principle of the inflammatory and oxidative theory of depression: A treatment study. Investigators: (Chief Investigator F) – Berk M, Channen A, Harrigan S, Davey C, Hetrick S, Dean O, Dodd S. 2012-2016. AUD \$1,475,510.00 over 5 years.
- 3) National Health and Medical Research Council (NHMRC). Project Grant (ID: APP 1026265). Project title: Inflammatory cytokines as risk factors for the development of both depression and osteoporosis in men. Berk M, Pasco J, Williams L, Jacka F. 2012-2015. AU \$369,360.
- 4) Alfred Deakin Postdoctoral Research Fellowship Investigator: Dean O. 2012-2014. \$67,628 per annum for 2 years.
- 5) NHMRC Project Grant. APP1021345. Scientific Title: Providing evidence for the primary prevention of the high-prevalence mental disorders in men: the role of diet in the aetiology of depression, anxiety, and psychological distress. CIs: Jacka, Berk, Pasco, Williams. 3 years commencing 2012. \$292,900.
- 6) NHMRC Project Grant. APP1021347. Scientific Title: Diet as a therapeutic target in depression: A randomised controlled trial. 3 years commencing 2012. CIs: Berk M, Jacka F, Castle D, Brazens L, Itsiopoulos C. \$481,810.
- 7) Simons Foundation – Autism Research Initiative. Pilot Grant 201473. Project Title: Efficacy of N-acetylcysteine in Autism. (Co-principal investigator) PI: Berk M, co-PI: Dodd S, Dean O, Gray K, Tonge B. 2012-2013. US\$293,108 over 2 years. Carried forward to 2014.
- 8) NIH R34 grant. A randomized trial of Internet based interventions for bipolar disorder – Moodswings 2.0. Berk M, Suppes T, Castle D, Cosgrove V, Lauder S, Berk L. Total budget is \$436,612 USD over 3 years. 2013-2015.
- 9) 2012 NARSAD Young Investigator Grant. Minocycline as an adjunctive treatment for depression. Investigator: Olivia Dean. 2012 -2013. \$59,225.



Successful Grants 2013

- 1) BUPA Foundation. Maternal vitamin D in pregnancy and childhood growth. Pasco J, Wark J. \$189,000 over two years.
- 2) International Society of Psychiatric Genetics. Travel award to participate in the XXIst World Congress on Psychiatric Genetics, USA. 2013. Singh A. \$2000.
- 3) NHMRC Centres of Research Excellence (CRE) for Funding Commencing in 2013. Centre of Research Excellence for optimising early interventions for young people with emerging mood disorder. APP 1061043. CIs: Hickie I, McGorry P, Christensen H, Berk M, Naismith S, Glozier N, Burns J, Guastella A, Davey C, Amminger P.. Administering Institution University of Sydney. Budget \$2,499,420.
- 4) Meat & Livestock Australia. Characterisation of dietary intakes and nutritional status of people with major depression and exploration of associated biological mechanisms PI: F Jacka, CIs C. Itsiopoulos, A O'Neil, E Szymlek-Gay, D Castle M Berk. \$250,000.
- 5) NHMRC Career Development Fellowship. Psychiatric disorders, psychotropic agents and bone health: From bench top to bedside. Lana Williams \$404,884.
- 6) NHMRC Established Career Fellowship. Novel therapies, risk pathways and prevention of mood disorders. Michael Berk. \$ 822,925.
- 7) Arthritis Australia. Social determinants of shoulder joint replacements 2007-12, nationwide. Sharon Brennan, Richard Page, Richard Osborne, Rachelle Buchbinder, Julie Pasco, Anita Wluka. \$10,000 for one year.
- 8) NHMRC. Geelong Osteoporosis Study. Fracture risk. Prediction based on 20 years of prospective data. Julie Pasco, Geoff Nicholson, Mark Kotowicz, Margaret Henry, David Evans. \$910,400 over 3 years.
- 9) Stanley Medical Research Institute. 2013-2015. Project title D-fend – Vitamin D First Episode Neuroprotection Design. Randomised clinical trial. SMRI Grant Application 13TAF-1687. Fiona Gaughran, John McGrath; Shubulade Smith, Philip McGuire, Michael Berk, David Taylor, \$1,443,293. The project is scheduled to run for three years.
- 10) Victorian Orthopaedic Research Trust. 2013. Socioeconomic status and shoulder joint replacement across Australia. Sharon Brennan, Richard Page, Richard Osborne, Rachelle Buchbinder, Julie Pasco, Anita Wluka, Kerrie Sanders, \$9100. The project is scheduled to run for 1 year.

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- 3) Singh AB, Bousman CA, Ng CH, Byron K, Berk M. Psychomotor depressive symptoms may differentially respond to venlafaxine. *International Clinical Psychopharmacology*. 2013. May;28(3):121-6.
- 4) Malhi GS, Tanious M, Das, P, Coulson CM, Berk M. Potential mechanisms of action of lithium in bipolar disorder. *CNS Drugs*. 2013;27(2):135-153.
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- 6) Berk M, Dodd S, Berk L. Treatment of bipolar depression. *Letters. Medical Journal of Australia*. 2013;198(3):138-139.
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- 8) Berk M, Berk L, Dodd S, Fitzgerald PB, de Castella AR, Filia S, Filia K, Brnabic AJM, Kelin K, Montgomery W, Kulkarni J, Stafford L. The sick role, illness cognitions and outcomes in bipolar disorder. *Journal of Affective Disorders*. 2013;146(1):146-9.
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- 10) Moylan S, Eyre HA, Maes M, Baune BT, Jacka F, Berk M. Exercising the worry away: how inflammation, oxidative and nitrogen stress mediates the beneficial effect of physical activity on anxiety disorder symptoms and behaviours. *Neuroscience & Biobehavioral Reviews*. 2013;37:573-584.
- 11) Maes M, Anderson G, Morris G, Berk M. Diagnosis of Myalgic Encephalomyelitis: where are we now? *Expert Opin Med Diagn*. 2013;7(3):221-225.
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Conference presentations

<p>Society of Behavioral Medicine</p> <p>San Francisco USA, March 2013</p>	<ul style="list-style-type: none"> Using technology to deliver interventions to improve health: How 'soft touch' is 'high tech'? O'Neil A, Oldenburg B, Taylor CB, Fisher E. <p>CONFERENCE SYMPOSIUM</p>
<p>European Congress on Osteoporosis and Osteoarthritis (IOF-ESCEO13)</p> <p>Rome, Italy April 2013</p>	<ul style="list-style-type: none"> Associations between bone mineral density, body mass index, and wedge deformities: the role played by extreme social disadvantage in the Tasmanian Older Adult Cohort. Brennan SL, Winzenberg T, Pasco JA, Wluka AE, Dobbins AG, Jones G. <p>POSTER PRESENTATION</p>
<p>ICAS Southern Africa and Tara Hospital</p> <p>South Africa April 2013</p>	<ul style="list-style-type: none"> Psychotherapy for bipolar disorder. Berk L. <p>ORAL PRESENTATION</p>
<p>Osteoarthritis Research Society International (OARSI) World Congress.</p> <p>Philadelphia, USA April 2013</p>	<ul style="list-style-type: none"> Associations between measures of obesity over 10 years and patella cartilage in a population-based cohort study of young to middle aged, asymptomatic women. Gunardi AJ, Brennan SL, Wang Y, Cicuttini FM, Pasco JA, Kotowicz MA, Nicholson GC, Wluka AE. <p>POSTER PRESENTATION</p>
<p>European Calcified Tissue Society</p> <p>Lisbon, Portugal May 2013</p>	<ul style="list-style-type: none"> Fracture risk among men, in relation to osteopenia and osteoporosis defined by areal bone mineral density. Pasco JA, Lane SE, Brennan SL, Timney EN, Bucki-Smith G, Dobbins AG, Kotowicz MA. <p>POSTER PRESENTATION</p>
<p>RANZCP Congress</p> <p>Sydney Australia May 2013</p>	<ul style="list-style-type: none"> NET polymorphism and Childhood Trauma – antidepressant efficacy and gene environment effects. Singh A, Castle D. <p>CONFERENCE SYMPOSIUM</p> <ul style="list-style-type: none"> The important of Positive Affect in Managing Depression. Singh A, Castle D. <p>CONFERENCE SYMPOSIUM</p>

Conferences continued...

<p>Australian Rheumatology Association Conference</p> <p>Perth, Western Australia May 2013</p>	<ul style="list-style-type: none"> Associations between measures of obesity over 10 years and patella cartilage in a population-based cohort study of young to middle aged, asymptomatic women. Gunardi AJ, Brennan SL, Wang Y, Cicuttini FM, Pasco JA, Kotowicz MA, Nicholson GC, Wluka AE. <p>POSTER PRESENTATION</p> <ul style="list-style-type: none"> An inverse association between patellar tendinopathy and patellar cartilage defects: results from two community based studies. Smith SE, Little RD, Wang Y, Wluka AE, Cook J, Giles GG, Pasco JA, Brennan SL, Cicuttini FM. <p>POSTER PRESENTATION</p>
<p>Annual European Congress of Rheumatology (EULAR)</p> <p>Madrid, Spain June 2013</p>	<ul style="list-style-type: none"> Associations between measures of obesity over 10 years and patella cartilage in a population-based cohort study of young to middle aged, asymptomatic women. Gunardi AJ, Brennan SL, Wang Y, Cicuttini FM, Pasco JA, Kotowicz MA, Nicholson GC, Wluka AE. <p>POSTER PRESENTATION</p>
<p>14th International Congress of the International Federation of Psychiatric Epidemiology (IFPE)</p> <p>Leipzig, Germany June 2013</p>	<ul style="list-style-type: none"> Obesity and disturbances in mood. Pasco JA, Williams LJ, Brennan SL, Jacka FN, Berk M. <p>ORAL PRESENTATION</p> <ul style="list-style-type: none"> Selective serotonin reuptake inhibitor (SSRI) use and bone health in men. Williams LJ, Pasco JA, Jacka FN, Hodge J, Dodd S, Kotowicz MA, Berk M. <p>POSTER PRESENTATION</p>
<p>10th International Conference on Bipolar Disorders (ICBD)</p> <p>Miami, USA June 2013</p>	<ul style="list-style-type: none"> MoodSwings - Outcomes and influences of a self-help online intervention for bipolar disorder. Lauder S. <p>ORAL PRESENTATION</p>
<p>10th International Conference on Bipolar Disorders (ICBD)</p> <p>Miami, USA June 2013</p>	<ul style="list-style-type: none"> Staging, neuroprogression and neuroprotection in bipolar disorder. Brainstorming session. Dodd S. <p>ORAL PRESENTATION</p>

Conferences continued...

<p>10th International Conference on Bipolar Disorders (ICBD)</p> <p>Miami, USA June 2013</p>	<ul style="list-style-type: none"> • Collaborative Research Team to Study Psychosocial Research Issues in Bipolar Disorder (CREST-BD) pre ICBD-conference meeting of invited researchers. • Development and evaluation of guidelines and information website. • A Collaborative approach to help fill the information gap for caregivers of people with bipolar disorder. Berk L. <p>ORAL PRESENTATION</p>
<p>10th International Conference on Bipolar Disorders (ICBD)</p> <p>Miami, USA June 2013</p>	<ul style="list-style-type: none"> • Bone Health in Adult Women with Bipolar Disorder. Stuart AL, Quirk SE, Berk M, Pasco JA, Jacka FN and Williams LJ. <p>POSTER PRESENTATION</p>
<p>World Congress of Biological Psychiatry (WFSBP)</p> <p>Kyoto Japan June 2013</p>	<ul style="list-style-type: none"> • Lifestyle risk factors and co-morbidity in patients with bipolar disorder. Berk M. • Oxidative and immune biomarkers as targets for novel therapies of unipolar and bipolar depression. Berk M. • Staging of depression and inflammatory biomarkers. Berk M. • Depressive has detrimental effects on bone mineral density. Williams L (presented by Berk M). • Preventing neuroprogression in bipolar disorder by early intervention. Berk M. • The impact of statins on psychological well-being. O'Neil A, Sanna L, Redlynch C, Sanderson K, Jacka F, Williams L, Pasco J, Berk M. <p>SYMPOSIUM PRESENTATIONS</p> <ul style="list-style-type: none"> • Social isolation rearing induces a pro-inflammatory state in rats with associated mitochondrial, neurochemical and behavioural deficits. Reversal by Clozapine or N-acetylcysteine. Harvey B, Moller M, Emsley R, Berk M, du Preez J. <p>FREE COMMUNICATION PRESENTATIONS</p> <ul style="list-style-type: none"> • Preventing depressive episodes in bipolar disorder – maintenance therapy. Berk M. <p>SATELLITE SYMPOSIUM PRESENTATION</p>

Conferences continued...

<p>cont...</p> <p>World Congress of Biological Psychiatry (WFSBP)</p> <p>Kyoto Japan June 2013</p>	<ul style="list-style-type: none"> • Depression has detrimental effects on bone. Speakers: Prof Michael Maes, Dr Lana Williams, Prof Tsuyoshi Myakka, Prof Angelos Phalaris. <p>SYMPOSIUM PRESENTATION</p>
<p>World Congress of Biological Psychiatry (WFSBP)</p> <p>Kyoto Japan June 2013</p>	<ul style="list-style-type: none"> • Reuse old news: Minocycline as a novel psychotropic. Dean OM. <p>SYMPOSIUM PRESENTATION</p>
<p>World Congress of Biological Psychiatry (WFSBP)</p> <p>Kyoto Japan June 2013</p>	<ul style="list-style-type: none"> • Novel approaches to the treatment of unipolar depression. O'Neil A, Dean O, Harvey B. <p>SYMPOSIUM PRESENTATION</p>
<p>Australian and New Zealand Bone and Mineral Society (ANZBMS)</p> <p>Melbourne Australia September 2013</p>	<ul style="list-style-type: none"> • Rheumatoid arthritis and incident fracture in women aged 35 years and over: A case control study. Brennan SL, Toomey L, Kotowicz MA, Henry MJ, Griffiths H, Pasco J. <p>ORALPRESENTATION</p> <ul style="list-style-type: none"> • Sex-differences in bone mineral density (BMD) t-scores in older adults referred for DXA: Data from the Barwon region. Dobbins AG, Williams LJ, Pasco JA, Sarah B, Kotowicz MA, Brennan SL. <p>POSTER PRESENTATION</p> <ul style="list-style-type: none"> • Fracture and utilisation of residential aged care in Australia. Gould H, Brennan SL, McInnis RJ, Kotowicz MA, Nicholson GC, Pasco JA. <p>POSTER PRESENTATION</p> <ul style="list-style-type: none"> • Selective serotonin reuptake inhibitors (SSRIs) inhibit human osteoblast genesis and decrease bone development and mineralization in zebra fish. Hodge JM, Frammer D, Collier FM, McMillan J, Kennedy RL, Ellis M, Walder K, Dodd S, Berk M, Pasco JA, Ashley D, Williams LJ, Gilbert Y. <p>POSTER PRESENTATION</p>

Conferences continued...

<p>cont...</p> <p>Australian and New Zealand Bone and Mineral Society (ANZBMS)</p> <p>Melbourne Australia September 2013</p>	<ul style="list-style-type: none">• Parental socioeconomic status and childhood fractures: Data from the Geelong Osteoporosis Study Fracture Grid. Hyde NK, Pasco JA, Brennan SL. <p>PLENARY POSTER PRESENTATION</p> <ul style="list-style-type: none">• Fracture epidemiology from cradle to grave. Pasco JA, Brennan SL, Timney EN, Bucki-Smith G, Lane SE, Dobbins AG, Zhang Y, Moloney D, Kotowicz MA. <p>POSTER PRESENTATION</p> <ul style="list-style-type: none">• Comparison of self-reported diagnosis and bone mineral density results in the identification of osteoporosis. Stuart A, Williams LJ, Brennan SL, Kotowicz MA, Pasco JA. <p>POSTER PRESENTATION</p> <ul style="list-style-type: none">• Antipsychotics inhibit human osteoclast formation and function. Torpy AM, Hodge JM, Collier FM, Pasco JA, Berk M, Williams LJ. <p>POSTER PRESENTATION</p> <ul style="list-style-type: none">• Selective serotonin reuptake inhibitors (SSRIs) decrease serum markers of bone turnover: Geelong Osteoporosis Study. Williams LJ, Berk M, Hodge JM, Kotowicz MA, Collier FM, Pasco JA. <p>POSTER PRESENTATION</p> <ul style="list-style-type: none">• Do Osteoporosis Related Quality of Life affect death in people aged 50 years and older: Geelong Osteoporosis Study (GOS). Zhang Y, Kotowicz MA, Pasco JA, Sanders KM. <p>POSTER PRESENTATION</p>
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<p>Australasian Chronobiology Society (ACS)</p> <p>Adelaide, South Australia September 2013</p>	<ul style="list-style-type: none"> Excessive daytime sleepiness and body composition: examination of a population-based sample. Hayley AC, Williams LJ, Kennedy GA, Berk M, Brennan SL, Pasco JA. <p>ORAL PRESENTATION</p>
<p>Public Health Association of Australia (PHAA)</p> <p>Melbourne Australia, September 2013</p>	<ul style="list-style-type: none"> Association between occupation and treatment qualification for fracture probability in men: Data from the Geelong Osteoporosis Study. Brennan SL, Moloney D, Kotowicz MA, Pasco JA. <p>POSTER PRESENTATION</p> <ul style="list-style-type: none"> Rheumatoid arthritis and incident fracture in women: A case-control study. Brennan SL, Toomey L, Kotowicz MA, Henry MJ, Griffiths H, Pasco JA. <p>ORAL PRESENTATION</p> <ul style="list-style-type: none"> Adult fracture and quality of life: a population-based study of Australian men. Dobbins AG, Brennan SL, Williams LJ, Pasco JA. <p>POSTER PRESENTATION</p> <ul style="list-style-type: none"> Does dietary calcium intake during pregnancy meet national recommendations? Hyde NK, Moloney D, Brennan SL, Wark J, Pasco JA. <p>ORAL PRESENTATION</p> <ul style="list-style-type: none"> Associations between smoking and physical activity in Australian men. Moloney D, Pasco JA, Brennan SL. <p>POSTER PRESENTATION</p>

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<p>cont...</p> <p>Public Health Association of Australia (PHAA)</p> <p>Melbourne Australia, September 2013</p>	<ul style="list-style-type: none"> • The burden of fractures in older men arises from those without osteoporosis: Geelong Osteoporosis Study. Pasco JA, Lane SE, Brennan SL, Timney E, Bucki-Smith G, Dobbins A, Kotowicz MA. <p>POSTER PRESENTATION</p> <ul style="list-style-type: none"> • Prevalence of mood and anxiety disorders in Australian men: Geelong Osteoporosis Study. Williams LJ, Jacka FN, Pasco JA, Coulson CE, Berk M. <p>POSTER PRESENTATION</p> <ul style="list-style-type: none"> • Suicidal ideation and physical illness: Does the link lie with depression. Williams LJ, Stuart A, Sanna L, Pasco JA, Kotowicz MA, Giradi P, Berk M. <p>ORAL PRESENTATION</p> <ul style="list-style-type: none"> • Occupation and treatment thresholds for osteoporotic fracture in men: Geelong Osteoporosis Study. Brennan SL, Moloney D, Kotowicz MA, Leslie WD, Pasco JA. <p>POSTER PRESENTATION</p>
<p>International Society for the Study of Personality Disorders (ISSPD)</p> <p>Copenhagen, Denmark September 2013</p>	<ul style="list-style-type: none"> • Association between DSM-IV personality disorder clusters and physical conditions in US adults. Quirk SE, El-Gabalawy R, Brennan SL, Bolton JU, Sareen J, Pasco JA, Berk M, Chanen A, Williams LJ. <p>ORAL PRESENTATION</p> <ul style="list-style-type: none"> • Personality disorders and physical conditions: National Epidemiological Survey on Alcohol and Related Conditions (NESARC). Quirk SE, El-Gabalawy R, Brennan SL, Bolton JU, Sareen J, Pasco JA, Berk M, Chanen A, Williams LJ. <p>ORAL PRESENTATION</p>

Conferences continued...

<p>Australasian Society for Bipolar and Depressive Disorders Conference (ASBDD)</p> <p>Melbourne, Australia October 2013</p>	<ul style="list-style-type: none"> Novel therapies and mechanisms Berk M. <p>INVITED SPEAKER</p>
<p>Australasian Society for Bipolar and Depressive Disorders Conference (ASBDD)</p> <p>Melbourne, Australia October 2013</p>	<ul style="list-style-type: none"> Bipolar disorder and bone mineral density in adult women: A nested case-control study. Stuart AL, Quirk SE, Berk M, Pasco JA, Jacka FN, Williams LJ. <p>POSTER PRESENTATION</p> <ul style="list-style-type: none"> Bone health and the use of selective serotonin reuptake inhibitors (SSRI) in adult men. Williams LJ, Pasco JA, Jacka FN, Hodge JM, Berk M. <p>POSTER PRESENTATION</p>
<p>26th European College of Neuropsychopharmacology (ECNP) Congress</p> <p>Barcelona, Spain October 2013</p>	<ul style="list-style-type: none"> Novel mechanisms to improve negative symptoms – initial success and new directions Bipolar mixed states: treatment New pharmacotherapies for schizophrenia Berk M. <p>INVITED SPEAKER</p>
<p>American Society for Bone and Mineral Research</p> <p>Maryland, USA October 2013</p>	<ul style="list-style-type: none"> The performance of FRAX according to different levels of socioeconomic adversity. (Sponsor – Brennan). Brennan SL, Leslie WD, Lix LM, Johansson H, Oden A, McCloskey E, Kanis J. <p>POSTER PRESENTATION</p> <ul style="list-style-type: none"> Is lower income associated with an increased likelihood of qualification for treatment for osteoporosis in Canadian women? (Sponsor Robert Josse). Brennan SL, Leslie WD, Lix LM, Johansson H, Oden A, McCloskey E, Kanis J. <p>POSTER PRESENTATION</p>

Conferences continued...

<p>cont...</p> <p>American Society for Bone and Mineral Research.</p> <p>Maryland, USA October 2013</p>	<ul style="list-style-type: none"> Osteocalcin and musculoskeletal health in older women. Levinger I, Scott D, Nicholson GC, Duque G, McCorquodale T, Stuart AL, Ebeling PR, Sanders KM. <p>POSTER PRESENTATION</p> <ul style="list-style-type: none"> Fracture Burden For Men, In Relation To Osteopenia And Osteoporosis Defined By Male And Female Reference Data For Areal Bone Mineral Density. (Sponsor - Pasco) Pasco JA, Lane SE, Brennan SL, Timney EN, Bucki-Smith G, Dobbins AG, Kotowicz MA. <p>POSTER PRESENTATION</p> <ul style="list-style-type: none"> Investigating the predictive ability of gait speed and knee extensor strength for incident falls in community-dwelling older women at high risk of fracture. Scott D, Nicholson GC, Stuart AL, Ebeling PR, Sanders KM. <p>ORAL PRESENTATION</p> <ul style="list-style-type: none"> Construction validity of the ICECAP-O index amongst people with non-traditional/no classical low trauma fractures. Zhang Y, Pasco JA, Sanders KM, Kotowicz MA. <p>POSTER PRESENTATION</p>
<p>Australasian Sleep Association 25th Annual Scientific Meeting (ASA)</p> <p>Brisbane, Australia October 2013</p> <p>NEW INVESTIGATOR AWARD PLENARY SESSION</p>	<ul style="list-style-type: none"> Excessive Daytime Sleepiness and Body Composition: A Population-Based Study of Women. Hayley AC, Williams LJ, Kennedy GA, Berk M, Brennan SL, Pasco JA. <p>ORAL PRESENTATION</p>
<p>School of Counsellors & Psychologists Conference</p> <p>Melbourne, Australia November 2013</p>	<ul style="list-style-type: none"> Is it possible to prevent depression? Berk M. <p>ORAL PRESENTATION</p>

Conferences continued...

<p>XXIst World Congress on Psychiatric Genetics</p> <p>Boston, USA October 2013</p>	<ul style="list-style-type: none"> • ABCB1 polymorphism predicts escitalopram dose needed for remission in major depression. Singh A. <p>ORAL PRESENTATION POSTER PRESENTATION</p>
<p>Australian Association of Gerontology</p> <p>Sydney, Australia November 2013</p>	<ul style="list-style-type: none"> • Modifiable lifestyle risk factors for nursing home admission: Systematic review. Gould H, Brennan SL, Dobbins AG, Kotowicz MA, Nicholson GC, Pasco JA. <p>POSTER PRESENTATION</p>
<p>World Diabetes Congress. Melbourne.</p> <p>Melbourne, Australia, December 2013</p>	<ul style="list-style-type: none"> • Employment and economic hardship are barriers to self-management in people with type 2 diabetes: Results from Diabetes MILES – Australia. Browne J, O'Neil A, Williams E, Horne R, Power F, Speight J. <p>ORAL PRESENTATION</p>
<p>The Australian Society for Psychiatric Research (ASPR) Conference</p> <p>Melbourne, Australia, December 2013</p>	<ul style="list-style-type: none"> • Oxidative and Immune Biomarkers as Targets for Novel Therapies. Berk M. <p>ORAL PRESENTATION</p> <ul style="list-style-type: none"> • The YoDA Trials: Conventional and Novel Treatment Approaches for Youth Depression. Berk M. <p>ORAL PRESENTATION</p> <ul style="list-style-type: none"> • Immune and Oxidative Biomarkers as Plastic Risk Pathways in Depression. Berk M. <p>ORAL PRESENTATION</p> <ul style="list-style-type: none"> • Onset and Progression: The Rationale for YoDA-A. Berk M. <p>ORAL PRESENTATION</p> <ul style="list-style-type: none"> • Inflammation as a Treatment Target. Berk M. <p>ORAL PRESENTATION</p>

Conferences continued...

<p>cont...</p> <p>The Australian Society for Psychiatric Research (ASPR) Conference</p> <p>Melbourne, Australia, December 2013</p>	<ul style="list-style-type: none">• Associations between 25-hydroxyvitamin D and depression: A systematic review. Brennan SL, Quirk SE, Hyde NK, Williams LJ, Markanday S, Pasco JA, Dobbins AG, Holloway KL, Velloni G, Hosking SM, Berk M. <p>POSTER PRESENTATION</p> <ul style="list-style-type: none">• The importance of optimizing database integration in health research: DIPIT (Database Integration Protocol in Ten-steps), a new standard for health researchers. Dipnall J, Williams LJ, Jacka FN, Dodd S, Berk M, Phung D, Venkatesh S, Pasco JA. <p>ORAL PRESENTATION</p> <ul style="list-style-type: none">• The association between sleep disorders and depression: Findings from The National Health and Nutrition Examination Survey, 2005-2008. Hayley AC, Williams LJ, Venugopal K, Kennedy GA, Berk M, Pasco JA. <p>ORAL PRESENTATION</p> <ul style="list-style-type: none">• The relationship between diet and mental health in children and adolescents: A systematic review. O'Neil A, Quirk SE, Housden S, Brennan SL, Williams LJ, Pasco JA, Berk M, Jacka FN. <p>ORAL PRESENTATION</p> <ul style="list-style-type: none">• Personality disorders and their relationship with physical health: Data from the National Epidemiological Survey of Alcohol and related Conditions (NESARC). Quirk SE, El-Gabalawy R, Brennan SL, Bolton J, Sareen J, Berk M, Chanen A, Pasco JA, Williams LJ. <p>ORAL PRESENTATION</p>
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<p>cont...</p> <p>The Australian Society for Psychiatric Research (ASPR) Conference</p> <p>Melbourne, Australia, December 2013</p>	<ul style="list-style-type: none"> • Comparison of self-report and structured clinical interview in the identification of depression. Stuart AL, Pasco JA, Jacka FN, Brennan SL, Berk M, Williams LJ. <p>POSTER PRESENTATION</p> <ul style="list-style-type: none"> • Differential actions of antipsychotics in human osteoclast formation and resorption. Torpy AMJ, Hodge JM, Collier FM, Berk M, Pasco JA, Ashley D, Williams LJ. <p>POSTER PRESENTATION</p> <ul style="list-style-type: none"> • The association between use of statins and aspirin, and the risk of mood disorders among men: A nested case control study. Williams LJ, Berk M, Venugopal K, Jacka FN, O'Neil A, Pasco JA. <p>ORAL PRESENTATION</p> <ul style="list-style-type: none"> • The association between selective serotonin reuptake inhibitors (SSRIs) and serum markers of bone turnover: Geelong Osteoporosis Study. Williams LJ, Pasco JA, Hodge JM, Kotowicz MA, Collier F, Berk M. <p>POSTER PRESENTATION</p> <ul style="list-style-type: none"> • Staging and neuroprotection. Dodd S. <p>ORAL PRESENTATION</p>
<p>International Osteoporosis Foundation (IOF) Regionals 4th Asia-Pacific Osteoporosis Meeting</p> <p>Hong Kong, China</p> <p>December 2013</p>	<ul style="list-style-type: none"> • Social patterning of primary total knee joint replacements performed for osteoarthritis across Australia 2003-10: Data from the Australian Orthopaedic Association National Joint Replacement Registry. Brennan SL, Lane SE, Lorimer M, Buchbinder R, Wluka AE, Page RS, Osborne R, Pasco JA, Sanders KM, Cashman K, Ebeling PR, Graves SE. <p>POSTER PRESENTATION</p>

Conferences continued...

<p>cont...</p> <p>International Osteoporosis Foundation (IOF) Regionals 4th Asia-Pacific Osteoporosis Meeting</p> <p>Hong Kong, China</p> <p>December 2013</p>	<ul style="list-style-type: none">• Cumulative fractures across the life course; age- and sex-related patterns of fracture prevalence. Holloway KL, Brennan SL, Dobbins AG, Timney EN, Bucki-Smith G, Williams LJ, Kotowicz MA, Pasco JA. <p>POSTER PRESENTATION</p> <ul style="list-style-type: none">• Age- and sex-related pattern of incident fractures for all ages. Pasco JA, Brennan SL, Timney EN, Bucki-Smith G, Lane SE, Dobbins AG, Williams LJ, Hyde N, Holloway KL, Zhang Y, Moloney D, Kotowicz MA. <p>POSTER PRESENTATION</p>
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