THE RESEARCH ISSUE

STAND *by* ME

Parkinson's NSW Inc
Issue 125 Winter 2016
ISSN 1839-0269

IN THIS TOGETHER
parkinson's NSW

UNITY WALK & RUN 2016

28th August | Sydney + Wollongong

FUN FOR ALL THE FAMILY (INCLUDING DOGS)

AMAZING PRIZES TO BE WON

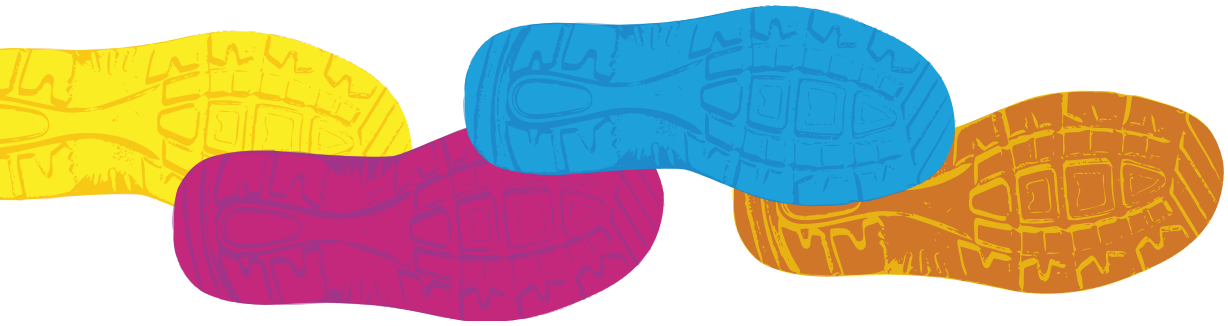
FREE KIDS ACTIVITIES

WOLLONGONG

- 2km Walk
- 5km Run

SYDNEY

- 4km Walk
- 4km Run
- 7km Run
- Half Marathon



Event partner

2016 GreaterBank RUN SERIES SYDNEY HALF

REGISTER NOW

www.unitywalkandrun.com.au

CONTENTS

World Planking Record page 2
From the President page 3
From the CEO page 4
World Parkinson's Day page 5
Independent Judging Panel page 6

SEED GRANTS

Melting freezing of gait with non-invasive cerebellar stimulation page 7
Melting freezing of gait with non-invasive cerebellar stimulation page 8
Pexidartinib as a disease modifying therapy of Parkinson's disease page 9
Mechanism and toxicity of superoxide dismutase-one aggregation in Parkinson's disease page 10
Unity Walk & Run page 11

UNITY WALK & RUN GRANTS

Towards effective exercise prescription to reduce pain in people with Parkinson's disease page 13
Lighting the pathway: Insights into neural circuitry of Parkinson's disease using optogenetics page 14
Activin A and Dyskinesias page 15
Calling all young researchers page 16
Halleluyah: choir singing benefits Parkinson's page 17
Parkinson's & the Gastrointestinal tract page 19
Lovely people I would never have met if I didn't have Parkinson's disease page 21
Early changes of motor circuits in health and Parkinson's disease page 22

WORLD RECORD PLANKING

Mick Bourke will once again attempt to break his own world record for the longest time planking at this year's Unity Walk & Run.

Mick will attempt to break his record of three minutes and eight seconds with over 35kg on his back during the warm up to the walk.

Mick, aged 61 has had Parkinson's disease for 11 years. He first started planking after his daughter encouraged him to do the 30 day planking challenge.

So come along and help cheer Mick on in his world record attempt.

Andrew Whitton

FROM THE **PRESIDENT**

PNSW is about to embark on its largest undertaking since its inception. The board had a strategic planning meeting earlier this year and the overall outcome was the decision to grow the organisation so that it has the capacity to provide additional services to PWP.

One of the most regular requests we have is for specialist neurological nurses from all around the state. There is no doubt that they provide a very valuable service as is evidenced from Nina Cheyne in the Illawarra and Vincent Carroll up at Coffs Harbour.

On the other side of the coin, there is no getting away from the fact that it is going stretch our resources, both financial and human. To this end we have developed two new marketing initiatives, are looking at a capital fundraising program and will bolster the administrative/ financial staff.

The first marketing initiative is our *Partner in Parkinson's Program* – this program has been designed to cater for the smallest supporter/ donor (Purple category) to the largest (Platinum category) with commensurate benefits according to the size of the commitment.

Where do you fit in…no matter how good the program is, it will only be successful if it is widely promoted and distributed….with somewhere between 25,000 and 30,000 PWP in NSW plus several hundred thousand additional people directly impacted by Parkinson's we have numbers on our side to make it happen, provided we have sufficient buy-in.

The second is the *Community Activities Guide* which is to assist individuals, groups and businesses in setting up fund raising activities within their communities. It could simply be "wear purple for Parkinson's" on a given day at your office or school and make a donation.

We are assessing the possibility of introducing a "Capital Fundraising Program" specifically to finance the nurses program – any funds raised in such a program would be quarantined from general working capital and as the name suggests is a capital fund where only the earnings from the fund would be used and the capital is preserved.

Our tag line "in this together" is appropriate when it comes to fundraising as does another well worn phrase "many hands make light work", if we all do something to help we will be able to achieve so much more!

The end of an era.

After almost 16 years in the top role Miriam Dixon has resigned as CEO of Parkinson's NSW. She was instrumental in developing and implementing the counselling, telephone and web information services; unique, free to all services for people living with Parkinson's. Miriam also supervised the all important Nurse's trial on the South Coast along with many other significant initiatives. Her enthusiasm, professionalism and dedication cannot be questioned.

I am sure that boards, past and present, will join me in thanking her for her efforts over this time and wish her well for the future.

Regards

Andrew Whitton

President, Parkinson's NSW

PS. See you at the 9th Unity Walk and Run on Sunday 28th August. Let's make it the biggest and best to date.

Philip Maundrell

FROM THE CEO

I have recently come on board at Parkinson's NSW as Interim CEO after spending eight and a half years on the Board of Parkinson's NSW of which seven were spent as Treasurer. I will fill this position until we can find a permanent replacement.

The Unity Walk & Run is the premier event for the Parkinson's Community in NSW for awareness and particularly fundraising. I have attended eight of the nine events, missing one from illness, and it has never ceased to amaze me to see the comradeship generated on the day. Three or four generations of families attend and many of these since inception.

This photo of Unity Walk features Kathryn Castelletto and her family completing the four kilometre walk at last year's event. Kathryn has attended every Unity Walk and her family has been involved in fundraising.

Without the support of the funds raised at the Unity Walk we would not be in a position to pay for the counselling and information services we offer. The more we raise the greater the amount we can allocate to our services. We are committed to expanding our nurse network over coming years which will considerably increase our funding requirements. Additionally, 50% of the funds raised at the Unity Walk go towards research.

Researchers such as Dr. Bryce Vissel, Dr. Rachel Codd and Associate Professor Colleen Canning have successfully gone on to gain major funding from other bodies as a result of receiving our initial seed grants. Seed grants play a significant role in allowing researchers to undertake innovative work and in this issue of Stand By Me we feature the 2015-2016 Seed Grant recipients.

I look forward to seeing as many of you as possible at this year's Unity Walk and, please come and say hello.

Phillip Maundrell
Interim CEO

L to R: Moran Gilat, Assoc Prof Antony Cooper, Dr Natalie Allen, Dr Dominic Hare, Sian Genoud, Assoc Prof Kay Double, Dr Viviana Wuthrich, Dr Asheeta Prasad, Hon Victor Dominello MP, Andrew Whitton and Miriam Dixon.

WORLD **PARKINSON'S DAY**

On April 11, Parkinson's NSW hosted a morning tea at State Parliament to award over $220,000 in research grants to seven innovative projects.

The Parkinson's NSW research program is vital to the NSW research community as it provides a unique source of funding which allows researchers the opportunity to embark on new and innovative research programs*ƒ*.

The Hon Victor Dominello MP, Minister for Innovation and Better Regulation and Andrew Whitton, Parkinson's NSW President presented the awards to the successful recipients.

After a short project overview from each recipient, attendees of the event were able to mix informally with the researchers to learn more about their work.

The recipients of the research grants were chosen by an independent judging panel. We would like to thank the members of the judging panel for their time and recommendations for these grants.

Parkinson's NSW is committed to supporting research and has awarded over $1.5 million in research grants over the past nine years. These grants were made possible by the fundraising and events undertaken by Parkinson's NSW.

INDEPENDENT **JUDGING PANEL**

PROFESSOR ROBERT CAPPAI

Department of Pathology, The University of Melbourne

Roberto Cappai is a Professor in the Department of Pathology at The University of Melbourne. He heads a laboratory that for the last 20 years has been studying the pathological and physiological pathways involved in Alzheimer's and Parkinson's disease, as well as traumatic brain injury. He has published over 190 papers and his main interests are: delineating the molecular mechanisms of amyloid mediated neurotoxicity, determining the factors that regulate protein aggregation, deciphering the interaction between alpha-synuclein and dopamine in Parkinson's disease and understanding the roles of the Amyloid Precursor Protein family in both health and following brain injury. His work has encompassed both basic research as well as drug discovery. He is currently a Deputy Chief Editor of the Journal of Neurochemistry.

DR MEGHAN THOMAS

Health Department of Western Australia

Dr Meghan Thomas is the Founding Director of the Parkinson's Centre (ParkC) with the support from Edith Cowan University and an Australian Research Council Discovery Grant in 2008. Meghan established this role to create a focal point for Parkinson's research within Western Australia to develop and manage a diverse team of researchers, clinicians, advocacy groups and people with Parkinson's and their families. Although Meghan now works with the Health Department of Western Australia, she remains an active member.

Meghan is a developmental neurobiologist who received her PhD from the School of Animal Biology, University of Western Australia. Her research interests include the role of transcription factors, such as the Pax genes, in development and cell replacement therapies for Parkinson's.

ASSOCIATE PROFESSOR JOHN POWER

Flinders Medical Centre, Adelaide

John Power is currently the Associate Dean of Teaching and Learning for the School of Medicine at Flinders University and head of the Parkinson's and Alzheimer's Laboratory. John teaches into the Medical program and the Bachelor Medical Science degree. His special focus in teaching is Pathophysiology which is about how diseases develop and how disease impacts on the normal physiology. John's laboratory runs projects on both Parkinson's disease and Alzheimer's disease. Here they have been mapping the cellular localisation of a range of antioxidant enzymes in the human brain and showing how they respond to the neuropathology in both diseases. Of particular interest is the development of Lewy bodies in Parkinson's disease and dementia with Lewy bodies. John works on human brain tissue which is obtained from the South Australian Brain Bank. They have made some new findings recently which have been published in the International Journal, Brain Pathology which shows how Lewy bodies are toxic to brain cells and the mechanism of cell death. John has been on the Board of Parkinson's South Australia for approximately 7 years and President for the last five.

SEED GRANTS

Melting freezing of gait with non-invasive cerebellar stimulation

Moran Gilat

PhD Candidate and Study Coordinator
Parkinson's Disease Research Clinic

Brain and Mind Centre, The University of Sydney
moran.gilat@sydney.edu.au

Freezing of Gait is one of the most devastating symptoms of Parkinson's disease, where patients suddenly lose the ability to take the next step while walking - often feeling as if their feet are being 'glued' to the floor. Freezing affects around half of all patients causing regular falls, immobility, and nursing home placement. Unfortunately, clinical management of freezing is very challenging with no current treatment able to completely alleviate this complex symptom.

With the help from Parkinson's NSW we therefore set out to reduce freezing of gait by using a novel stimulation technique called intermittent Theta Burst Stimulation (iTBS) of the Cerebellum, which is a brain region known to be involved in Parkinsonian gait disorders. This technique uses repetitive magnetic pulses that are applied to the scalp to stimulate the underlying brain region. This potential treatment has the advantage of non-invasively accessing a promising target for one of the most debilitating symptoms of Parkinson's disease, without the surgical risks associated with invasive brain stimulation techniques. Importantly, iTBS is a safe and cost-effective technique that could provide a new treatment avenue for all Parkinson's patients experiencing Freezing of Gait.

Previous studies have shown that iTBS only requires short stimulation periods (40-190 seconds) to achieve long lasting therapeutic effects (up to 1 hour). We therefore envision that if this treatment proves successful, patients will be able to apply iTBS as a preventive strategy not only helping them to overcome freezing, but preventing Freezing of Gait altogether. This will therefore improve the mobility, independence and quality of life for over half of patients with Parkinson's disease.

This study has been developed following international collaborations between our group at the Parkinson's Disease Research Clinic, Brain and Mind Centre of the University of Sydney led by Professor Simon Lewis and a research group in the Netherlands led by Professor Bas Bloem, another leading expert in the field of Parkinson's disease research. We are grateful for receiving seed funding from Parkinson's NSW, which will allow us to perform a pilot study that will form the basis for a larger scaled randomised clinical trial to implement this potential treatment.

We look forward to reporting our findings in a next edition of *Stand By Me*. If you have any questions please contact me.

Thank you,

SEED GRANTS

Psychological treatment of anxiety and depression in patients with Parkinson's disease: A pilot study.

Investigators: Dr Viviana Wuthrich (pictured) & Professor Ron Rapee

Affiliation: Centre for Emotional Health, Department of Psychology, Macquarie University
Viviana.Wuthrich@mq.edu.au

Summary

We aim to evaluate the effectiveness of a psychological intervention to treat co-occurring depression and anxiety in patients with Parkinson's disease. This will be the first study to do so. We will compare the effectiveness of this intervention to usual treatment in patients with Parkinson's disease. We will also examine the impact of the intervention on carer distress. Patients with Parkinson's disease with symptoms of depression and anxiety are needed for this study (see recruitment details below).

Background

Depression and anxiety is experienced in up to 50% of patients with Parkinson's disease and is associated with poorer quality of life, poorer functioning and greater physical and cognitive decline. Depression in the patient is also strongly associated with caregiver or spouse distress. Therefore effectively treating anxiety and depression in people with Parkinson's disease will have a major impact on burden of the disease for both the patient and their carer. Despite this, very few studies have examined the effectiveness of psychological interventions for treating anxiety and depression in patients with Parkinson's disease, and when they have they have focused on either treating anxiety or depression, but not both together. Depression and anxiety frequently co-occur and when they do are associated with worse outcomes. So therefore there is a great need to develop psychological programs that treat both depression and anxiety. In addition, the value of including carers in treatment programs has not been well evaluated. Given that carers can play a critical role in assisting the patient to manage their symptoms and to manage cognitive difficulties that can be associated with the disease, and given the high rates of burden on carers, it is critical to develop a program to treat anxiety and depression in patients with Parkinson's disease that also includes carer participation.

We have previously developed and demonstrated in two large randomised controlled trials the efficacy of a Cognitive Behavioural Therapy (CBT) intervention for treating co-occurring anxiety and depressive symptoms in older adults without Parkinson's disease. In two trials, this program led to significant reductions in both anxiety and depressive symptoms with large effects that were maintained for 6 months post-treatment. In a novel approach we plan to modify our successful program to target anxiety and depression in patients with Parkinson's disease. The program will be modified to address the specific needs of patients with Parkinson's disease. It will also be adapted to create a role for the carer in the program so that they will participate and learn the skills taught to the patient and can assist the patient with the skills if needed. Improvements in both patient and carer distress will be compared between the two interventions.

Recruitment

We seek patients with Parkinson's disease, over the age of 50 years, who are experiencing symptoms of low mood and anxiety (or worry) to participate. If you are interested in participating, please call 02: 9850 8034 or email Viviana.Wuthrich@mq.edu.au for more information on the study.

SEED GRANTS

Pexidartinib as a disease modifying therapy of Parkinson's disease

Associate Professor Antony Cooper

Head, Neurodegeneration & Neurogenomics Program

Garvan Institute of Medical Research

Alpha-Synuclein, a protein closely associated with Parkinson's disease, can assume an alternative structure/shape that is toxic to neurons (brain cells). High levels of toxic alpha-synuclein are found in patients' brain where it is thought to contribute to neuron failure and associated PD symptoms. With disease progression, neuron dysfunction and loss becomes widespread as toxic alpha-synuclein is observed in more brain regions accompanied by additional symptoms. Current treatments do not slow or stop this progression.

Neurons that contain increased amounts of toxic alpha-Synuclein can release the protein where unfortunately it can be taken up by healthy neurons not yet affected by disease. Once inside, the toxic alpha-synuclein triggers these healthy neurons to fail and degenerate. This cycle of transmission between neurons is a popular hypothesis to account for the "spread" of (toxic) alpha-synuclein to different brain regions and disease progression in patients. (Note: Parkinson's disease does not spread between people). Identifying how toxic alpha-synuclein is transmitted between neurons would provide excellent targets for new drugs/therapies to block alpha-synuclein transmission and slow or stop progression of Parkinson's disease.

We suspect that specialised non-neuron brain cells called microglia may play a central role in the "spreading" of alpha-synuclein between neurons. To test this, we will inhibit microglia in mice using Pexidartinib, a drug that has been shown to impair the spread of a toxic Alzheimer's disease protein, and observe if this slows or stops the spread of alpha-synuclein in mice brains. Success in this project would both demonstrate that microglia participate in alpha-synuclein transmission as well as raise the possibility of Pexidartinib being used directly to treat Parkinson's disease patients as this drug has already been used to treat other diseases in humans.

SEED GRANTS

Mechanism and toxicity of superoxide dismutase-one aggregation in Parkinson's disease

Associate Professor Kay Double, (L) University of Sydney and **Dr Dominic Hare**, (R) University of Technology, Sydney and Florey Institute, Melbourne

Abnormal proteins are linked to cell death in multiple brain disorders, including Parkinson's disease. Research in Parkinson's disease brain has traditionally focused on the deposition of a protein called alpha-synuclein, however the data suggests that accumulation of this protein alone is not responsible for brain cell death. Supported by a 2015 Parkinson's NSW Seed Grant, we recently identified abnormal deposits or aggregates of another protein in the Parkinson's disease brain, called superoxide dismutase 1 or SOD1. These SOD1 deposits were only present in brain regions which die in Parkinson's disease and were not found in brain area that remain healthy, suggesting a clear link with brain cell death.

Interestingly, deposition of SOD1 protein is linked to cell death in another degenerative disorder, amyotrophic lateral sclerosis (ALS or motor neuron disease). Deposition of SOD1 in ALS results from alterations in the structure and metal content of the protein. We have demonstrated that the structure of SOD1 is similar in ALS and Parkinson's disease brain, suggesting pathways of protein deposition and nerve cell death may be similar in these two disorders. In this project we will investigate if the deposition of SOD1 protein results in brain cell death in a novel model of Parkinson's disease. We will also investigate why SOD1 might be depositing in the Parkinson's disease brain. If our hypothesis is correct this project may identify an important novel pathway which might explain why only specific brain cells die in Parkinson's disease. Importantly, if we find that SOD1 deposition in Parkinson's disease occurs via a similar mechanism to that occurring in ALS it will suggest that a new treatment targeting deposition of SOD1 in ALS, now in clinical trials, could also be beneficial in Parkinson's disease. This treatment aims to prevent abnormal protein deposition, halt nerve cell death and thus slow disease progression.

UNITY
WALK & RUN

Parkinson's NSW is pleased to announce some exciting changes to the 2016 Unity Walk & Run event. As our biggest fundraising and awareness event, a significant amount of money and staff time is spent to ensure that the event is a success every year.

Over the past eight years, the event has become an important get-together for the Parkinson's community and their families and we have raised over $1million in total. The primary purpose of the Unity Walk & Run is to raise much needed funds to support the free services we provide.

We are continually looking to improve and grow the event. With this in mind, we have made some changes in 2016 that we are very excited about and we hope you will be too!

The key changes include; a new partnership with Athletics NSW, the addition of a half-marathon, a comprehensive fundraising kit and a change to the allocation of event t-shirts.

The new partnership with Athletics NSW means that we will be sharing some costs associated with running the event and sharing some logistics resources on the day. We are in great company with this partnership as the Event Manager from Athletics NSW who is helping us with the event, is Rio bound Olympic marathoner, Scott Westcott!

In addition to some costs savings, the partnership with Athletics NSW also means the exciting addition of a half marathon to the Sydney event. We are hoping to attract new participants to the Unity Walk & Run through this event and are hopeful that the challenging distance will assist people fundraising for Parkinson's NSW.

This year, we are asking all participants to challenge themselves to raise $200 for Parkinson's NSW. To help achieve this, we have created a fundraising kit that includes posters, flyers and email templates. These resources and more tips can be downloaded from the event website at www.unitywalkandrun.com.au

Due to the high cost and wastage associated with providing event t-shirts to every participant; we will only be providing a t-shirt to participants who raise over $50 for Parkinson's NSW. We recognise that many people like a memento of the day, so we will be providing a commemorative bookmark to all participants. People can purchase additional event t-shirts on the day for $25.

The Parkinson's NSW Unity Walk & Run will be held in Sydney and Wollongong on Sunday August 28. Online registrations are now open and people can do this online at www.unitywalkandrun.com.au. To keep costs low, we encourage all participants to register via the website.

We look forward to seeing you on August 28.

L to R Scott Westcott (Athletics NSW), Yousef Abdi (Little Athletics NSW), Clare Audet (Parkinson's NSW), Andrew Whitton (Parkinson's NSW), Miriam Dixon (Parkinson's NSW), Duncan Tweed (Athletics NSW), Claire Tester (Parkinson's NSW), David Saad (Greater Bank)


parkinson
NSW
Counsellin
InfoLine
Education
Neurological Nurse
Support Groups
Research grants
1800 644 189

UNITY WALK & RUN **GRANTS**

Towards effective exercise prescription to reduce pain in people with Parkinson's disease

Dr Natalie Allen (pictured)

Faculty of Health Sciences, University of Sydney

Dr Benjamin Barry

School of Medical Sciences, UNSW

Dr Leanne Hassett

Faculty of Health Sciences, University of Sydney

Prof Colleen Canning

Faculty of Health Sciences, University of Sydney

Pain is a troubling symptom experienced by many people with Parkinson's disease (PD). While some of this pain is due to similar reasons as pain experienced by people without PD, it is increasingly recognised that pain in PD can also be part of the disease process. There is emerging evidence that exercise might be effective in helping people with PD to manage pain. However, it is also possible that some forms of exercise may exacerbate pain. Aerobic exercise (eg walking) is commonly performed by people with PD, and there is evidence that walking on a treadmill is effective in improving step length and walking speed. This project aims to determine if aerobic exercise in the form of treadmill walking has an immediate pain relieving effect (i.e. exercise–induced analgesia) and if exercise-induced analgesia varies with the dose of treadmill walking. In addition, we will also be investigating any relationships between measures of pain, exercise-induced analgesia and physical activity levels. The results of this study will inform the design of a trial to investigate the effect of an ongoing exercise intervention aimed at reducing pain in people with PD.

Thirty people with PD and 30 people of similar age without PD will undergo 2 testing sessions each, 1 to 2 weeks apart, at the University of Sydney, Faculty of Health Sciences in Lidcombe. At one testing session, participants will walk on the treadmill at a speed that is equivalent to light exercise for them, and at the other session they will walk on the treadmill at a speed that is equivalent to hard exercise for them. People who have a problem with balance will wear a harness while walking on the treadmill to ensure that they do not fall.

Before and after the treadmill walking, participants will undergo pressure pain threshold testing. This involves applying pressure to the thigh or upper arm using a pressure algometer. Pressure will be gradually increased until the participant reports that the sensation of pressure has turned to pain (i.e. pain at a level of 1 out of 10 on a 0 to 10 rating scale, where 0 is no pain and 10 is severe pain). An increase in the pressure pain threshold after the walking would indicate the presence of exercise-induced analgesia.

Participants with Parkinson's disease will also undergo activity monitoring between the 2 testing sessions. This will involve wearing an Actigraph activity monitor attached to an elastic belt for 7 consecutive days, as well as keeping a brief log book of physical activity and pain during that time. This will provide information to allow us to investigate the relationships between pain, exercise induced analgesia and physical activity.

The team would like to thank Parkinson's NSW for the grant allowing this work to proceed and for their previous research support which has hugely contributed to the development of the evidence-based for exercise in Parkinson's disease.

Any readers interested in participating in this research can contact Dr Natalie Allen on 9351 9016 for further information.

Lighting the pathway: Insights into neural circuitry of Parkinson's disease using optogenetics

Dr Asheeta Prasad

Senior Research Associate,
School of Psychology, UNSW

A hallmark of Parkinson's is the loss of dopamine neurons. Dopamine neurons receive inputs from the striatum via two pathways, known as the direct and indirect pathways. The direct pathway directly inhibits dopamine neurons, which facilitates movement. Whereas the indirect pathway projects to the globus pallidus (GP) and subthalamic nucleus (STN) inhibits movement.

These pathways work in concert to exert well-balanced control over movement. Disturbances in these neural pathways lead to deregulation in motor control. In animal models it has been shown that increased activity of the indirect pathway results in symptoms similar to Parkinson's signature tremor. In addition to motor control, these brain pathways also influence motivation, cognition and reward seeking behaviour. Motivation and cognition contribute significantly to learning, continuing with therapies, lowering levels of depression common in Parkinson's patients.

Deep brain stimulation of the indirect pathway (globus pallidus and subthalamic nucleus) are current targets for surgical procedures for Parkinson's patients who fail medical management. The precise effect of deep brain stimulation manipulation on these brain regions on motor control are not clear. Moreover, the effects of deep brain stimulation on non-motor behaviours, such as motivation, learning and memory are also unclear. The spectrum of motor deficits varies considerably within patients, such as variations in resistance to limb movement and posture instability. Deep brain stimulation of these two brain regions may contribute to different aspects of motor control.

The Parkinson's NSW grant will allow me to apply a novel technology called optogenetics to stimulate these brain regions to establish the role of these brain regions in motor and cognitive behaviours. The second part asks whether optogenetic stimulation in these pathways can restore the motoric or cognition or both motoric and motivational deficits in an animal model of Parkinson's disease.

The outcomes from this research project has therapeutic relevance as it will establish the effects of GP and STN manipulation in movement and motivation. This knowledge may be applied to guide selection between which brain regions to deep brain stimulation, which can rescue Parkinson's motor deficits with fewer side effects on other important behaviours.

UNITY WALK & RUN **GRANTS**

Activin A and Dyskinesias

Professor Bryce Vissel (pictured)

Head, Neuroscience and Regenerative Medicine at the University of Technology Sydney

Doctor Sandy Stayte

Garvan Institute

The motor symptoms of Parkinson's disease develop when approximately 70% of the dopamine-producing cells are damaged in a small region within the midbrain area. This loss of cells then results in a subsequent loss of the chemical dopamine within the striatum, which is a critical brain region for smooth, purposeful movement. Despite decades of research, the most effective treatment for the motor symptoms of Parkinson's disease remains the replenishment of lost dopamine levels through the administration of levodopa (L-Dopa).

However, chronic, long-term use of L-Dopa often leads to the development of L-Dopa-induced dyskinesias, which present a significant impediment to a high quality of life for patients.

Professor Bryce Vissel, who was recently appointed as head of an exciting new initiative for Neuroscience and Regenerative Medicine at the University of Technology Sydney, and Doctor Sandy Stayte from the Garvan Institute, (soon to also be at UTS) were recently awarded the 2015 Unity Walk Research Grant from Parkinson's NSW to study how inflammation in the brain contributes to dyskinesias. While there is relatively little known regarding the mechanisms of dyskinesias, this relationship of neuroinflammation to dyskinesias is gaining interest in the scientific field. The researchers will investigate if an anti-inflammatory drug, called activin A, can either reduce the severity of dyskinesias or delay their onset.

Their research builds upon their previous studies, which demonstrated that activin A is able to significantly dampen the inflammatory response that occurs in a mouse model of Parkinson's disease, and furthermore, that this anti-inflammatory effect allowed the majority of dopamine cells to survive. Excitingly, the researchers have also shown that activin A, when used in combination with low doses of L-Dopa, is able to induce motor recovery in Parkinsonian animals, suggesting that activin A is able to potentiate or enhance the effects of L-Dopa.

Professor Vissel and Doctor Stayte will now be using the Research Grant provided by Parkinson's NSW to begin investigating the symptomatic effects of activin A on dyskinesias. The researchers aim to administer activin A directly into the brains of Parkinsonian mice using a "minipump" delivery system and will induce dyskinesia by administering daily injections of L-Dopa. They will then determine if activin A is able to delay the onset of dyskinesia and/or reduce their severity and compare its effects to amantadine, an established anti-dyskinetic treatment. Furthermore, the researchers will be investigating if directly blocking inflammation with a broad spectrum anti-inflammatory medicine will display therapeutic effects against dyskinesias, and also to compare this effect to activin A, an anti-inflammatory with a more specific mechanism.

Until now, almost all treatments for Parkinson's disease have focused on replacing the dopamine that is lost in the brain, with L-Dopa remaining the most effective. However, long-term use of L-Dopa can lead to debilitating dyskinesias. With the support of Parkinson's NSW, Professor Vissel and Doctor Stayte hope that their research will provide the first steps for the development of a novel therapeutic drug that will significantly diminish the impact that dyskinesias have on the quality of life of patients.

CALLING ALL YOUNG RESEARCHERS

Parkinson's NSW is calling for submissions for our 2016 Young Researcher of the Year Award. This unique award is open to early career scientists under 40 who are PhD students and 5 years post (relative to opportunity) and currently researching into Parkinson's disease in NSW.

The award is designed to recognise the role that young researchers play in advancing the knowledge of Parkinson's and highlight the importance of scientists being able to communicate scientific concepts into easy to understand language to promote awareness.

This is a fantastic opportunity for early career researchers to raise their profile within the Parkinson's research community and the broader community.

Researchers are asked to submit an article of up to 500 words that outlines their current research project along with a submission document that highlights their enthusiasm for researching into Parkinson's. An expert judging panel of the scientific and lay community will narrow the submissions down to four finalists.

The 2016 Young Researcher of the Year will be announced at the Parkinson's NSW Annual General Meeting on November 30th and will receive a $250 voucher, a trophy to keep and have their article published in the Parkinson's NSW Stand By Me magazine.

Submissions must be received by October 14th, 2016.

To request a submission pack, please contact Alyson Blanks at pnsw@parkinsonsnsw.org.au or 02 8051 1900

HALLELUJAH

Choir singing benefits people with Parkinson's

By Kirstin Robertson-Gillam PhD RN. Reg Psychotherapist. Reg Music Therapist

Why do many of us like to sing, especially in a group such as a choir? We all know that singing makes us feel good, but why?

Research shows that, for people with Parkinson's, choir singing has many benefits such as increasing and maintaining quality of voice; maintaining healthy lungs; assisting with walking and moving; enhancing social interactions and, in particular, minimising depression and anxiety which are high in people who have Parkinson's Disease.

Major Depression is a common and devastating disorder that is ranked as the third leading cause of disability in the world. It can significantly reduce quality of life and wellbeing, particularly for people with Parkinson's.

Major depression is associated with a substantial number of symptoms that range in severity causing impairments in cognitive, physical and social functioning (Kessler et al., 2003). Furthermore, untreated depression is well known to be a risk factor for developing dementia in Parkinson's Disease, or other neurological disorders (Olver and Burrows, 2007; Burrows, 2004). Depression can also increase non-compliance to pharmacological treatments further complicating other medical conditions that are associated with Parkinson's (Blazer, 2005).

The progressively deteriorating condition of Parkinson's can break down social relationships between friends and families. Because social isolation is a major contributing factor to developing depression at any age, programs that are known to enhance socialisation, build interpersonal bonds and personal insights may lead to improved coping strategies and minimize mood disorders. These types of creative programs include music making, vocal work, art work and dance, stimulating spontaneity, enjoyment, mastery of new skills and socialisation.

Neuroscientific studies indicate that music can significantly stimulate many brain structures at the same time. For instance, Blood and Zatorre (2001) reported that the 'chills' response – a pleasurable response to music, activates changes in heart rate and respiration. Additionally, Warner-Schmidt and Duman (2006) reported that music can generate

positive emotions in the hippocampal area of the brain, which is reduced in people with depression. Furthermore, Castillo-Peretz and others in 2010, reported that pleasurable music listening can increase the production of dopamine and Salimpoor and others in 2011 linked the intense pleasure that the 'chills' response to music produces, with dopamine release.

When communication difficulties arise in people with Parkinson's, music can help. In fact, research shows that the brain uses parallel pathways for generating melodies and sentences (Ozdemir and others, 2006). This can become a fun activity in a choir for people with Parkinson's.

Furthermore, Robertson-Gillam (2014) found that the brain becomes re-balanced in people with depression after eight weeks of a choir singing program, giving further credence to the effectiveness of a choir program.

So, what are we waiting for? Let's get together and sing for our health and wellbeing. Singing is fun as well as being highly therapeutic.

Kirstin works at Parkinson's NSW as a counsellor and educator. She is also a registered music therapist who has run and researched therapeutic choirs for the past sixteen years. She is happy to hear from anybody who might be interested in joining a choir at the North Ryde Parkinson's site.
Her number is: 8051 1907 or ring the Infoline on 1800 644 189.

References

Blazer, D. G. and Celia F. Hybel (2005). Origins of depression in later life. *Psychological Medicine*, 2005, 35, 1–12. f 2005 Cambridge University Press DOI: 10.1017/S0033291705004411 Printed in the United Kingdom

Blood, A. J., & Zatorre, R. J. (2001). Intensely pleasurable responses to music correlate with activity in brain regions implicated in reward and emotion. *Proceedings of the National Academy of Sciences*, 98(20), 11818-11823.

Burrows, G. (2004). Dementia linked to depression. *Australian Nursing Journal*, April 2004. Melbourne, Australian Nursing Federation.

Castillo-Pérez, S., Gómez-Pérez, V., Velasco, M. C., Pérez-Campos, E., & Mayoral, M. A. (2010). Effects of music therapy on depression compared with psychotherapy. *The Arts in Psychotherapy*, 37(5), 387-390.

Kessler, R. C., Berglund, P., Demler, O., Jin, R., Koretz, D., Merikangas, K. R., & Wang, P. S. (2003). The epidemiology of major depressive disorder. *JAMA: Journal of the American Medical Association,* 289(23), 3095-3105.

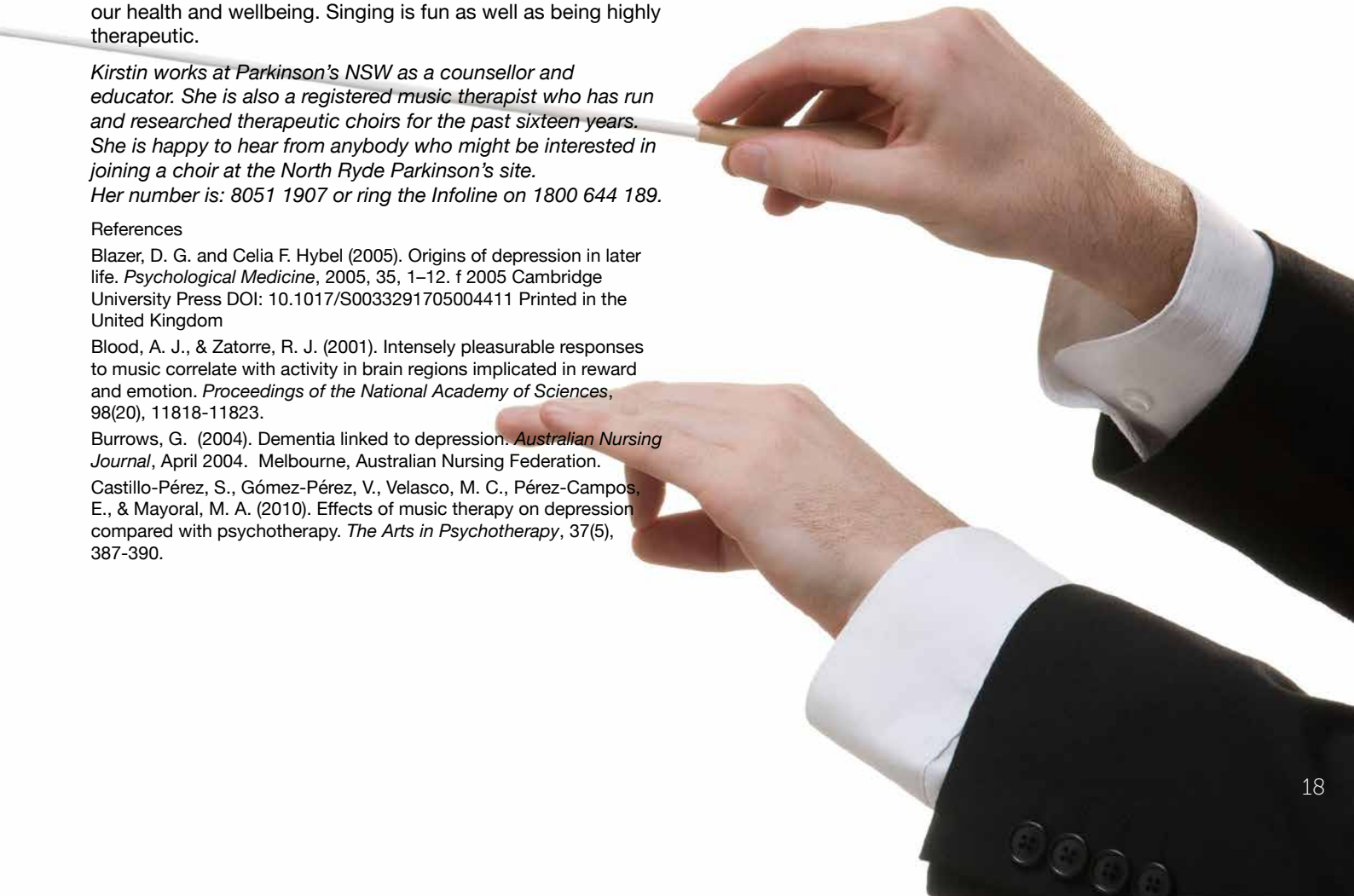
Olver, J., & Burrows, G. (2007). Dealing with depression and medical illness. *Australian Prescriber,* 30(4), 58-79.

Özdemir, E., Norton, A., & Schlaug, G. (2006). Shared and distinct neural correlates of singing and speaking. *Neuroimage*, 33(2), 628-635.

Robertson-Gillam, K. E. (2014) Reducing Major Depression in Mid to Later Life with a Choir Therapy Program. *Unpublished PhD thesis.* Western Sydney University. Salimpoor, V. N.,

Benovoy, M., Larcher, K., Dagher, A., & Zatorre, R. J. (2011). Anatomically distinct dopamine release during anticipation and experience of peak emotion to music. *Nature neuroscience*, 14(2), 257-262.

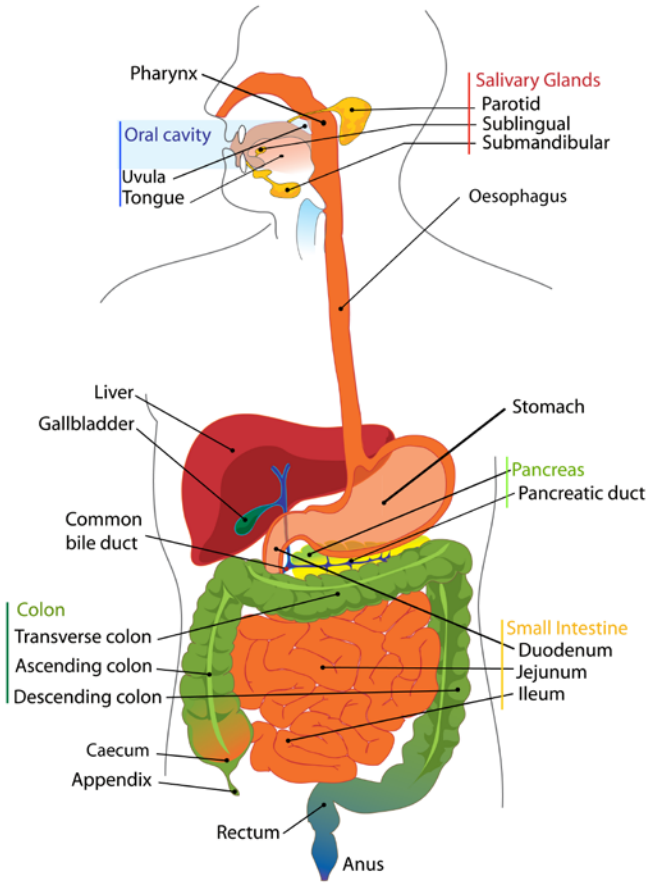
Warner-Schmidt, J. L., & Duman, R. S. (2006). Hippocampal neurogenesis: opposing effects of stress and antidepressant treatment. *Hippocampus*, 16(3), 239-249.



PARKINSON'S DISEASE
& THE GASTROINTESTINAL TRACT

By Dr Paul Clouston

The gastrointestinal tract (GIT) extends from the oral cavity to the anus and includes the pharynx, the oesophagus, the stomach, the small and large intestine. The association of the gastrointestinal tract and Parkinson's disease is complex but may be summarised as follows:



1. Many of the symptoms of PD are a consequence of direct dysfunction of the GIT from PD.
2. PD treatment are may lead to GIT dysfunction as a side-effect
3. There is some evidence that the GIT may be involved in the cause of PD.

In this first article I will address the first of these issues and describe the GIT symptoms directly due to PD and their management with reference to the oral cavity, oropharynx, oesophagus, stomach and small intestine.

Oral Symptoms

PD patients have an increased incidence of periodontal disease. One reason may be their inability to brush their teeth efficiently, but reduced jaw opening and even apathy may also play a part. In any event it is important for PD patients to receive regular dental checks

Drooling is another symptom of PD especially in its later stages. It is likely that reduced clearance of saliva rather than saliva over-production, plays the major causative role. Drooling is socially embarrassing and may contribute to silent aspiration caused by pharyngeal disco-ordination. Treatment of drooling is primarily pharmacologic including tricyclic antidepressants and botulinum toxin injections.

Difficulty in Swallowing (Dysphagia)

This problem is under estimated in PD. Probably in the order of 35% of PD patients are symptomatic however many patients are unaware they have a problem and formal testing yields a much higher prevalence, around 80%. Oropharyngeal dysphagia is related to rigidity and bradykinesia affecting swallowing muscles but dyscoordination and impairment of oesophageal motility may also contribute. Both may increase the risk of silent aspiration leading to an increased

risk of pneumonia. Impaired oesophageal motility may also contribute to increased “heartburn” or reflux. Any difficulty in swallowing in PD, even a “moist voice” or a cough after meals, is worthy of investigation and a consultation with a speech therapist. There are a number of voice or pharyngeal strengthening exercises that may help.

Gastroparesis

Impairment of the emptying of the stomach is present in the majority of PD patients, again under-recognised. Nausea, rarely vomiting, bloating and early satiety can all be features. These symptoms may also be caused by levodopa treatment. Delayed gastric emptying can lead to impaired absorption of levodopa in the proximal small intestine. Metaclopramide (Maxalon) improves gastric emptying but make Parkinsonism worse and is contraindicated. Dromperidome (motilium) is the drug of choice to aid gastric emptying in PD.

Small Intestine and Bacterial Overgrowth

Our intestines are normally colonised by ‘normal’ bacterial flora, normal in number and strain. Presumably related to impaired intestinal motility, PD patients may have an increased incidence of overgrowth of bacteria in the small intestine. Some studies suggest that this bacterial overgrowth may contribute to malapsorption of levodopa and motor fluctuations. Bacterial overgrowth may respond to antibiotics, but when they are stopped it returns due to the continued presence of predisposing factors.

LOVELY PEOPLE I WOULD NEVER HAVE MET

IF I DIDN'T HAVE PARKINSON'S DISEASE

By Joe Golding

Two of the worst symptoms of Parkinson's disease are freezing and falling. Freezing is when your body just stops and won't respond to your mind's commands.

Freezing can leave you stranded in the middle of the road when the lights change. A freezing episode may last for several phases of the lights and there is only so much patience. One moment you are moving smoothly and the next you are strung out over your walking frame trying to hang on. Freezing can occur without warning.

However terrible this disease is, it still has one positive aspect. It has taken 21 years of living as a diagnosed Parkinsonian but I have finally found something nice about having it. The big point of enlightenment for me is that I have discovered how helpful people can be. I have met many very nice people who have come to my assistance in the community. There are nice people who want to help me when I am trying to walk in the street and freeze. It is so hard to tell them that there is nothing they can do help me. Some understand what I am saying but others just seem hurt.

Then there those who come to help me to stand when I fall. They help to lift my walker from on top of me and after helping me to stand seem reluctant to leave me. There was one occasion in Martin Place, Sydney when I was befriended by a lovely young lady who escorted me the entire length of Martin Plaza and convinced strangers to push me across roads while sitting in my walker so that I could get across before the traffic lights changed.

I will never forget the very kind man who called a taxi for me while I stood in the rain outside the shops in Brookvale. He knew that no taxi was going to accept me for the short fare I wanted so he went home and changed his car so that my walker would fit and returned to the shops to collect me and drove me to the accommodation where I was staying. He was a good Samaritan above and beyond the call of good Samaritans.

I will never forget him.

There are some lovely people in this world and I am pleased to have met so many of them. You can see in the eyes of some people that they have or had a close person who had Parkinson's and they want to help you so much that it almost hurts. Others clearly don't understand the disease but just want to help.

There is a whole world of helpful people out there and if I wasn't an atheist I would say, "God bless them".

Early changes of motor circuits in health and Parkinson's disease

Researchers at The University of Sydney are seeking volunteer participants to learn how the brain controls movement in health and disease. The aim of the study is to investigate the structure and function of brain regions responsible for movement. Results from this study will enable us to understand why movement control changes in disorders such as Parkinson's disease.

We are currently seeking eligible volunteers between the ages of 50 to 70, with no diagnosed medical disorders affecting movement (for example, no Parkinson's disease), who are willing to have their movement examined as well as images of their brain collected.

Participation in the study, led by Associate Professor Kay Double, will consist of 1 to 3 appointments at Neuroscience Research Australia (Randwick 2031) and/or the Brain and Mind Centre (Camperdown 2050).

If you would like to be involved or would like further information, please contact:

Assoc. Prof. Kay Double
T: 02 9114 4292
E: kay.double@sydney.edu.au

Karl Pierre-Antoine Aoun
T: 04 522 666 72
E: kaou6412@uni.sydney.edu.au

Cover Image

Assoc Professor Kay Double & PhD student Ben Trist

Photographer: Victoria Baldwin