

children's diabetes centre

Research. Education. Advocacy

Centre of Research Excellence: Type 1 Diabetes

PROGRESS REPORT 2017-2018



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ABOUT THE CENTRE

Living with type 1 diabetes, a chronic and incurable disease has a major physical, emotional and financial impact on individuals and their families. The Children's Diabetes Centre, based at the Telethon Kids Institute and Perth Children's Hospital in Western Australia, is an integrated clinical and research centre that aims to improve the lives of children, adolescents and young adults living with type 1 diabetes. The Centre's uniquely holistic research program incorporates sophisticated technologies, therapies and education. The Centre was established in 2015 by a Centre for Research Excellence (CRE) grant from the National Health and Medical Research Council and JDRF Australia.



It is the only paediatric research centre of its kind in Australia. The Centre is a joint initiative between the Endocrinology and Diabetes Department at Perth Children's Hospital, and the Telethon Kids Institute. The Centre has an established international reputation as a leader in clinical diabetes research and a team that includes clinical fellows, post-doctoral researchers, research assistants, program/project managers, clinical trial managers, PhD students and administrative support, as well as numerous local, national and international collaborators from leading research institutions.



The Centre is led by Co-Directors Professor Timothy Jones (left) and Professor Elizabeth Davis (right). Our primary objective is to generate significant new knowledge that will lead to positive changes in care that improves outcomes. We do this by focused research studies that include clinical investigations, clinical trials, epidemiological studies and qualitative research projects and we translate the results of these studies into the clinic and the community.

We aim to:

- Help patients maintain optimal blood glucose levels to help reduce the long-term complications of diabetes.
- Reduce the frequency and impact of low blood glucose (hypoglycaemia).
- Develop, test and refine new diabetes technologies such as closed loop systems and translate these into clinical practice.
- Increase the confidence of children, adolescents and young adults with diabetes as well as their families and their health professionals in using technology (continuous glucose monitoring and insulin delivery technology).
- Better understand the impact of food and exercise on glycaemic control and translate our findings into clinical practice and guidelines.
- Measure and improve the mental health and quality of life for young people with type 1 diabetes and their families.
- Better understand why diabetes occurs and how to prevent it.
- Improve educational outcomes for children and young people with type 1 diabetes.
- Be instrumental in translating new treatments and knowledge into routine clinical practice.

OUR PEOPLE

DIRECTORS

Professor Timothy Jones, Co-Director, Children's Diabetes Centre and Medical Co-Director, Perth Children's Hospital

Professor Liz Davis, Co-Director, Children's Diabetes Centre and Head, Diabetes and Endocrinology, Perth Children's Hospital

CHIEF INVESTIGATORS

Professor Donna Cross, Telethon Kids Institute
Professor Elizabeth Geelhoed, University of WA

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ASSOCIATE INVESTIGATORS

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Murdoch Children's Research Institute

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MANAGEMENT

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RESEARCH FELLOWS/POST DOCTORAL RESEARCHERS

Dr Aveni Haynes, Research Fellow

Dr Jacqueline Curran, Consultant

Dr Uma Ganti, Clinical Research Fellow

Dr Marie-Anne Burckhardt, Clinical Research Fellow

Dr Leanne Fried, Research Fellow

Dr Mary Abraham, Clinical Research Fellow

Dr Ashleigh Lin, Research Fellow

Dr Keely Bebbington, Research Fellow

Dr Kiranjit Joshi, Clinical Research Fellow

Dr Vinutha Shetty, Clinical Research Fellow

RESEARCH NURSES AND RESEARCH ASSISTANTS

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Professor Margaret Grey

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Professor Peter Adolfsson,

University of Gothenberg, Sweden

OUR RESEARCH



Summary of how the Children's Diabetes Centre improves outcomes

The Children's Diabetes Centre undertakes research in the following themes:

■ Diabetes Technology – Theme Lead: Dr Mary Abraham

We are interested in how technology can monitor glucose levels and regulate insulin delivery in day-to-day lives of people living with type 1 diabetes. Researchers from the Centre are currently involved in an international effort to develop revolutionary closed-loop 'artificial pancreas' technology — a device that closely mimics the glucose regulating function of a healthy pancreas.

We first tested the system for overnight blood glucose control under laboratory conditions and are now leading an Australia-wide trial of these portable devices at home. Our technology studies, involving randomised controlled trials of continuous glucose monitoring (CGM), pump therapy with suspend functions and hybrid closed loop systems endeavour to improve lives of children and adolescents with type 1 diabetes. These studies also generate data that will help refine algorithms used in these technology devices. We aim to test these technologies across a range of scenarios that are challenging to an individual with type 1 diabetes.

We are also undertaking studies that will foresee the successful translation of the research outcomes into clinical practice. And better understand the facilitators and barriers of technology uptake. These studies will help us establish optimal use of diabetes technology, with an overall impact of improved outcomes for people with type 1 diabetes, now and into the future.

■ Exercise – Theme Lead: Dr Vinutha Shetty

Regular physical activity is recommended for people with type 1 diabetes, but it can increase the risk of hypoglycaemia and consequently, people with diabetes are often reluctant to engage in regular physical activity.

Our exercise studies are focused on better understanding how young people with diabetes can exercise safely because the health benefits of an active lifestyle play an important role in their treatment.

Our in-clinic studies have detailed the glucose requirements for different exercise intensities and insulin levels; the impact of blood glucose levels and sprints on glucose requirements with exercise; the reproducibility of blood glucose responses to exercise; and the impact of hyperglycaemia on exercise performance.

We aim to translate our findings into clinical guidelines for young people with diabetes to ensure they have the confidence to exercise regularly. Translation of our research into accessible guidelines for patients and health professionals has taken a staged approach, engaging all stakeholders and will include a randomised controlled trial of the use of these guidelines by young people.

■ Food – Theme Lead: Professor Elizabeth Davis

Our food and diet studies look closely at the relationship between the amount of carbohydrate and insulin required to maintain healthy blood glucose levels; as well as the impact of other factors such as gastric emptying and the proportion of macronutrients (fat, protein and carbohydrate) on blood glucose levels. We aim to quantify insulin requirements in response to varying macronutrients under different conditions that will inform algorithms for the optimal delivery of insulin through diabetes technology. The impact of this theme will be improvements in blood glucose control with an overall impact of improved outcomes for people with type 1 diabetes now and into the future.

■ Epidemiology – Theme Lead: Dr Aveni Haynes

This theme focuses on understanding the risk factors and determinants of type 1 diabetes. Our epidemiological studies aim to identify modifiable risk factors and determinants of type 1 diabetes in order to help prevent type 1 diabetes from developing in the future.

■ Mental Health and Wellbeing – Theme Lead: Dr Keely Bebbington

Our mental health studies are designed to improve our understanding of the impact of type 1 diabetes on the mental health and wellbeing of patients and their families. By identifying risk and protective factors for poor mental health and developing and trialling new interventions we aim to prevent the progression of low levels of psychological distress into more serious mental health conditions and ultimately improve the wellbeing of young people with type 1 and their families.

■ Improving the School Experience for Patients with type 1 diabetes – Theme Lead: Dr Leanne Fried

Our school studies look at identifying factors that support children with type 1 diabetes at school and designing school-based interventions so that schools are upskilled to support students. Our studies not only aim to support schools to assist students with type 1 diabetes to manage their blood glucose levels but also to enhance their psychosocial needs including ensuring the support of peers, targeting transitions as times of need and developing strong communication between school and home.

■ Capacity for Long Term Evaluation of New Therapies – Theme Lead: Professor Tim Jones

We aim to develop the capacity for the long-term evaluation of diabetes clinical care, technology and new therapies through the development of a robust, functional and comprehensive population-based database to track patient outcomes from diagnosis through to adulthood. This resource will allow us to answer critical research questions that will eventually identify diabetes care associated with the best outcomes and this will be translated into clinic which will improve outcomes for people living with type 1 diabetes.

RESEARCH HIGHLIGHTS 2017 and 2018

■ Technology Theme

In November 2017, a dozen teenagers took part in week long day and night trial of the new and improved closed-loop insulin pump system — a device that acts like an artificial pancreas – at Woodman Point Discovery Park. This was the first time in the world that this new system had been tested in a real-life scenario.

Another study on new technology found that an insulin pump can halve children’s exposure to hypoglycaemia if it includes an automated system to suspend basal insulin when hypoglycaemia is predicted.

We also reported the outcomes of a large study investigating insulin pump therapy, as compared to injection therapy, in children with type 1 diabetes. We found that children with type 1 diabetes using an insulin pump have better glycaemic control than those using multiple daily insulin injections.

In mid-2018, the Centre commenced the Hybrid Closed-Loop Outpatient Trial which involves testing a partially automated insulin delivery system to see if it is better at optimising blood glucose levels than standard therapy. The preliminary reports are that blood glucose levels are being controlled much better and that people with diabetes have to work less hard to control their diabetes.

We undertook a world-first survey of the impact of external diabetes technologies on intimacy and sexual health. The findings of this survey provide insight for healthcare professionals when discussing external diabetes technologies with young people.

We contributed to Clinical Practice Consensus Guidelines 2018: Assessment and Management of Hypoglycemia in Children and Adolescents with Diabetes.

■ Exercise Theme

The Children’s Diabetes Centre held summits for young people with type 1 diabetes to get their input into the development of new exercise guidelines for patients.

The three summits explored how participants use technology (apps) to help manage physical activity and diabetes.

The groups were also asked for their thoughts on what the new exercise guidelines should contain and how they should be presented.

The final summit provided an opportunity for young people to be involved in the co-design of an app for the new exercise guidelines.

Our researchers contributed to the International Society of Paediatric and Adolescent Diabetes (ISPAD) Clinical Practice Consensus Guidelines 2018: Exercise in Children and Adolescents with Diabetes.

■ Epidemiology Theme

Our study of youth onset type 2 diabetes (2001-2016) found that it is increasing in Western Australia, particularly in girls and in those of Indigenous descent.

At the end of 2018, we recruited our 166th family into the Environmental Determinants of Islet Immunity (ENDIA) Study; this is an Australia-wide study exploring widespread genetic and environmental factors thought to be related to the risk of type 1 diabetes in babies born with a family history of type 1 diabetes. By looking at differences in these factors between those children who do, and do not develop type 1 diabetes, ENDIA aims to find out what causes type 1 diabetes so we can find ways to prevent it.

In 2017, we were involved in reporting on the outcomes of the Adolescent Cardio-Renal Intervention Trial (Addit): Retinal Vascular Geometry and Renal Function in Adolescents with Type 1 Diabetes.

■ Food Theme

Our study of insulin requirements for a high-fat high -protein meal compared to a low-fat low-protein meal found that the addition of fat and protein increases the amount of insulin required for a meal. What we found is the effect of fat and protein together is greater than the effect of protein alone. We also found substantial individual differences indicating the need for individualised advice.

■ Mental Health Theme

In 2017, we received funding for a research fellowship with a dedicated focus on the mental health and wellbeing of young people with type 1 diabetes and their families. Dr Keely Bebbington, a clinical psychologist researcher, was appointed in July 2018 as the inaugural McCusker Research Fellow in Type 1 Diabetes. Dr Bebbington has, in consultation with Centre researchers, developed a mental health strategy and will be conducting several studies trying to understand how we can help relieve diabetes-related distress.

Our researchers found continuous glucose monitoring (CGM) with remote monitoring reduced the fear of hypoglycaemia and as a result, improved quality of life and family functioning.

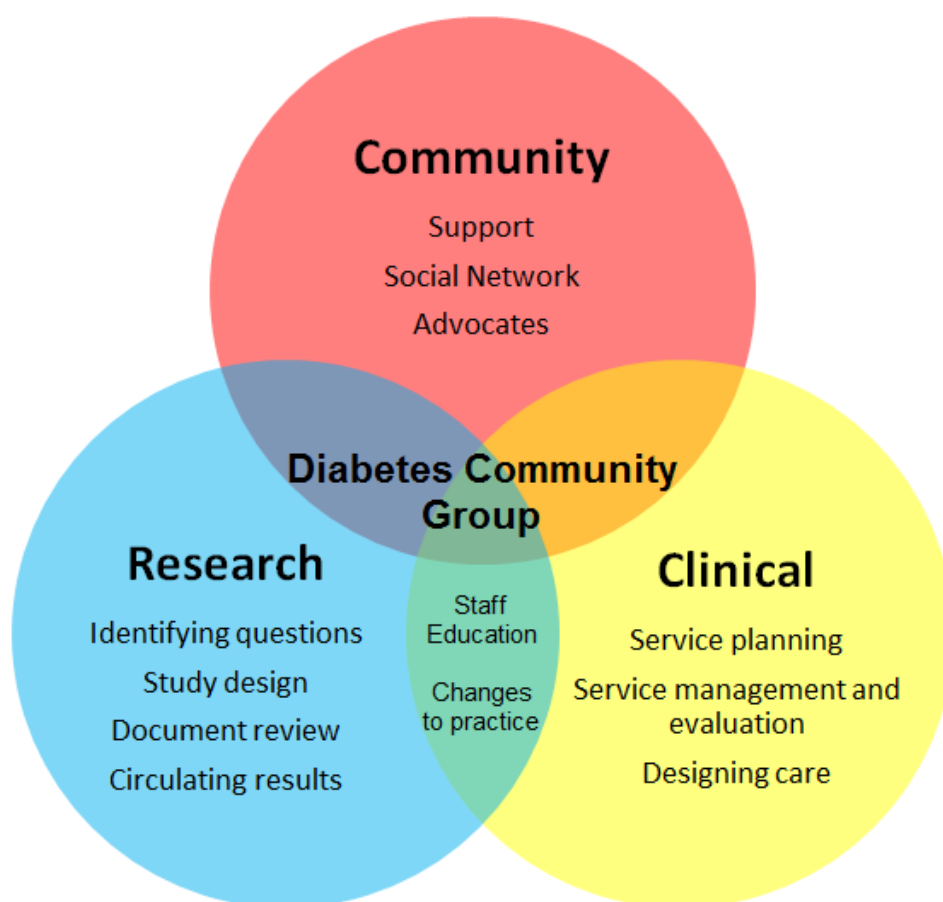
■ Schools theme

In 2018 we developed a model designed to help build the capacity of schools to support students with type 1 diabetes informed by our research on understanding the experiences of children and adolescents with type 1 diabetes and their parents.

COMMUNITY AND CONSUMER PARTICIPATION

The Children's Diabetes Centre acknowledges the importance of community members providing feedback and guidance about issues that are important to them. The purpose of the Diabetes Community Group is to provide a forum through which to provide feedback that improves clinical services, that gives a community perspective on current and future research activities and provides a forum for communication of research findings and outcomes.

By hearing directly from the type 1 diabetes community, we can develop and design research that is important to families.



Events

In November 2017, the Centre held a Community Forum for parents and young people with type 1 diabetes. The attendees were split into groups and workshopped three questions at the forum:

- Ideas for future research projects and the relevance and usefulness of current projects
- How to improve clinical services at PMH and the new Perth Children's Hospital
- Ways to communicate and engage with the type 1 diabetes community

The feedback and suggestions we received on the evening were fantastic and we continue to re-visit the comments on a regular basis.

Several new studies have been developed based on the suggestions on the evening. These are all ongoing projects in the areas of schools and mental wellbeing, transition to adulthood, integration of technology including CGM and the impact of swimming.

■ Workshops

In 2017 and 2018, we invited members of the community group to attend the Children's Diabetes Centre annual workshop. The workshops are a forum for our research team to meet with our adult and national collaborators, to review the research currently conducted by the Centre, and to generate new ideas.

As the Centre moves to translating the findings from our research into clinical practice, we need to be mindful of the impact this can have on families managing type 1 diabetes. We found it very beneficial having parents in the room to discuss our research ideas, and the possible impact they could have on families managing the disease.

■ Grant Review

Each year the Children's Diabetes Centre provides seeding funding grants (up to \$20,000 each) for new projects. The grants are open to anyone who has an affiliation with the Centre, or to encourage new collaborations, and can relate to any aspect of research related to the goal of the Centre which is to improve the lives of young people living with type 1 diabetes and their families.

The grants are awarded based on a review by a panel, including members of the Diabetes Community Group. Reviewers are asked to give feedback on: the importance of the project to the type 1 community and the practicalities of the proposed study and to rank the study proposals. Over the past four years, rotating community representatives have reviewed 32 grant proposals, and have elected to award 17 grants worth \$323,668.

In 2018, we approached the community group to provide input and review grant applications being submitted to external funding bodies by the Centre. This was the first time we had done this. We found the input to be extremely valuable and consequently, we have done this again in 2019. The reviews provided feedback on the study design, the implications on families participating in the studies and strategies to disseminate the findings.

AWARDS 2017 and 2018



Clinical Research Fellow Dr Vinutha Shetty was awarded a JDRF Mentored Clinician Researcher Fellowship for her project: Guidelines to reduce hypoglycaemia and glucose excursions caused by exercise in young individuals with type 1 diabetes.



Dr Marie-Anne Burckhardt, Clinical Research Fellow, was awarded the Emerging Investigators Award at the Australasian Paediatric Endocrine Group Scientific Meeting held in Hobart in 2017.



Professor Tim Jones, Co-Director of the Centre, was honoured by the Australian Diabetes Society as the recipient of the Jeff Flack Diabetes Data Award for his contribution and commitment to diabetes data collection in Australia.



Dr Karen Rothacker received the prestigious Australian Diabetes Society President's Clinical Young Investigator Award at the 2018 Australasian Diabetes Congress. Her research looked at exercise performance in recreationally active young people with type 1 diabetes.



Dr Mary Abraham, Clinical Research Fellow was awarded UWA's 2018 Dean's Early Career Research Most Cited Publication Award.



In October 2018, our Clinical Research Coordinator Niru Paramalingam used the proceeds of her 2017 Telethon Kids Institute Kudos Award to attend the annual International Society for Paediatric and Adolescent Diabetes (ISPAD) conference in Hyderabad, India. Niru was named the winner of the Engage and Inspire Award category, which is awarded to a staff member, student or Honorary who makes a conscious effort to engage and inspire those around them.



In 2017, Barbara Keating was awarded the DAA Dietetic Research Prize, awarded to the best oral abstract presentation at the ADS-ADEA conference on an evidence-based, nutrition/dietetics-related topic by an Accredited Practising Dietitian (APD) for her presentation of the Protein and Fat research.

OUR STUDENTS

■ *Dr Mary Abraham* — Dr Abraham's PhD has involved several trials of diabetes technology including in-clinic and home studies testing the efficacy of the Predictive Low Glucose Management System in the prevention of hypoglycaemia.

■ *Kristina Abramoff*— Kristina commenced her PhD at UWA in 2018 and plans to investigate the effect of exercise and head out of water immersion of different temperatures on the rate of fall in blood glucose level in type 1 diabetes.

■ *Dr Marie-Anne Burckhardt* — Dr Burckhardt's PhD aims to improve patient care in young people with type 1 diabetes using advances in technology to reduce morbidity around hypoglycaemia.

■ *Dr Jaqueline Curran* — Dr Curran's PhD is on the effect of a novel treatment for weight loss in obese adolescents.

■ *Cory Dugan* — Cory's Honour's project investigates the effects of acute hypoxia on blood glucose level and carbohydrate oxidation rates during moderate intensity exercise in individuals with type 1 diabetes.

■ *Zac Leow* — Zac commenced his PhD at UWA in 2016. He is exploring the benefits and risks of managing blood glucose levels with ketogenic low carbohydrate diets in adults with type 1 diabetes.

■ *Jennifer Nicholas* — Jennifer commenced her PhD in 2017 examining health literacy, in conjunction with measures of psychosocial risk and wellbeing and diabetes health outcomes.

■ *Analise Nicholl* — Analise, a PhD student at Edith Cowan University, is researching the effects of dairy fat on body fat, metabolic and heart health in young children. She is looking at body, gut and blood biomarkers of metabolic syndrome, a strong predictor of the likelihood of developing type 2 diabetes and cardiovascular disease.

■ *Niru Paramalingam* — Niru's PhD is on standardising the euglycaemic clamp protocols for maintaining euglycaemia in the face of glycaemic modulation. The aim is to facilitate reproducibility in terms of glycaemic variability during clamp studies run by different researchers or for paired studies, irrespective of clamp experience.

■ *Alison Roberts* — Alison's Master of Philosophy degree has, in part, explored parental perspectives of their experiences when their child is diagnosed with type 1 diabetes, and to determine if a diagnosis of type 1 in a parent has any influence on their coping, adaption, and management of their child.

■ *Kate Miller* — Kate's PhD project is looking at the association between ambient ultraviolet radiation exposure and type 1 diabetes risk.

■ *Dr Vinutha Shetty* — Dr Shetty's PhD focuses on exploring the different factors that affect glucose response to exercise such as exercise intensity and insulin levels and in turn, to estimate glucose requirements to maintain stable blood glucose levels during exercise.

■ *Wayne Soon* — Wayne's PhD is aimed at improving our knowledge on managing blood glucose levels during exercise. His studies have included investigating the changes in blood glucose levels during and after continuous moderate intensity exercise, compared to interval exercise.

EVENTS

JDRF One Walk

Did you see Children’s Diabetes Centre team members at the record turnout for the 2017 JDRF One Walk to raise much-needed funds for type 1 diabetes?



2018 JDRF Event

In May 2018, the Children’s Diabetes Centre showcased its progress in paediatric type 1 diabetes research held at the Telethon Kids Institute. The informative evening featured presentations from Centre Co-directors Tim Jones and Liz Davis along with a presentation on exercise by Dr Vinutha Shetty. Panel guests Gayle Scott-Nicholls and Andrew Brown, who are involved in trials at the Centre, also spoke about their experiences of participating in clinical research.

2017 Children’s Diabetes Centre Workshop

This workshop provided a great opportunity for diabetes researchers to get together in the one venue to showcase their exciting work. Around 60 attendees participated in presentations that looked at diet and exercise, diabetes technology and ways to translate diabetes research into practice. A highlight of the event was brainstorming ways in which translation could be applied to the team’s research and how new technologies could improve patient care.



2018 Federal funding announcement

An exciting development on a national front was the announcement, in September 2018, of a new Federal Government initiative to support children with type 1 diabetes in schools.



Our Co-Director, Professor Liz Davis (pictured), contributed to advocating and securing this much needed funding. The \$6 million schools’ education and training program will be implemented at every school with a student with type 1 diabetes.

New Patient Folder



In May 2018 and coinciding with our move to the Perth Children’s Hospital, the Children’s Diabetes Centre launched the New Patient Folder — a comprehensive resource to help families navigate a new type 1 diabetes diagnosis, now and into the future.

2018 Children’s Diabetes Centre Workshop



In late October 2018, the Children’s Diabetes Centre hosted its annual research workshop at University Club at UWA. The workshop focus was on ways in which we can translate our research to improve patient care.

OUTPUTS

■ IN 2017 AND 2018:

- We were awarded **\$346,268** in peer reviewed grant funding
- We published **42 articles** in peer reviewed journals
- We were involved in **18 inviting speaker engagements**
- We presented our findings at **29 national and international conferences**
- We supported **7 seeding research projects** to a total value of over \$140,000
- We supported **8 Centre researchers** to attend national and international conferences to present their work.

■ GRANTS AWARDED TO CRE MEMBERS 2017 and 2018

Dr Vinutha Shetty, *Guidelines to reduce hypoglycaemia and glucose excursions caused by exercise in young individuals with type 1 diabetes mellitus*, 2017 JDRF Mentored Clinician Researcher Fellowship, \$80,000.

Dr Ashleigh Lin, Dr Daniel Rudaizky, Professor Tim Jones, Professor Elizabeth Davis, Dr Uma Ganti, Mrs Wendy Radcliffe and Dr Johanna Wigman, *Characterising fluctuations in stress, anxiety and blood glucose levels in adolescents with type 1 diabetes*, 2017 Seeding Grant Australasian Paediatric Endocrinology Group, \$10,000.

Dr Mary Abraham, Professor Tim Jones, Professor Elizabeth Davis, *Dishabituation in the restoration of hypoglycaemia awareness in patients with type 1 diabetes and impaired hypoglycaemia awareness*, 2017 Diabetes Australia Research Program, \$57,871.

Jennifer Nichols, Dr Leanne Fried, Wendy Radcliffe, Tiziana Bufacchi, Dr Ashleigh Lin, Professor Elizabeth Davis and Rena Vithiatharan, *Piloting the use of an Acceptance Commitment Therapy (ACT) intervention to improve quality of life for adolescents with type 1 diabetes*, 2017 Seeding Grant, PCH Foundation \$19,242.

Dr Uma Ganti, Professor Elizabeth Davis, Dr Jacqui Curran, Mark Shah and Jennifer Nicholas, *The use of flash continuous glucose monitoring as an adjunct to standard clinical care as an educational tool in improving glycaemic control and self-care management skills in children and adolescents with type 2 diabetes*, 2017 Seeding Grant, PCH Foundation, \$21,800.

Professor Elizabeth Davis, *The T1D Support in Schools model: Enhancing the psychosocial development of students with type 1 diabetes*, 2017 UWA Research Impact Grant, \$19,790.

Barbara Keating and Professor Elizabeth Davis, *Postprandial hyperglycaemia in type 1 diabetes: identification of individual patterns to improve clinical management*, 2018 Seeding Grant, PCH Foundation \$19,694.

Dr Aveni Haynes, Dr Megan Penno, Professor Maria Craig, Professor Peter Colman and Associate Professor Mark Harris, *Using continuous glucose monitoring (CGM) to characterise early dysglycaemia in young children at risk of type 1 diabetes*, 2018 Diabetes Research WA, \$60,000.

Dr Vinutha Shetty, *Developing an Exercise Guidelines App for people with Type 1 Diabetes*, 2018 Telethon Trust, \$60,000

Dr Keely Bebbington, *Characterising moment-to-moment fluctuation in stress, anxiety and blood glucose levels in children and adolescents with type 1 diabetes*, 2018 Cockell Research Collaboration Award, \$14,912.

PUBLICATIONS IN PEER REVIEWED JOURNALS

This is a list of publications from Centre staff for 2017 and 2018. Please visit our website www.childrensdiabetescentre.org.au for a complete list of our publications.

1. Abraham, M. B., Davey, R. J., Cooper, M. N., Paramalingam, N., O'Grady, M. J., Ly, T. T., Jones, T. W., Fournier, P. A., & Davis, E. A. (2017). Reproducibility of the Plasma Glucose Response to Moderate-Intensity Exercise in Adolescents with Type 1 Diabetes. *Diabetic Medicine*, *34*(9), 1291-1295. doi:10.1111/dme.13395
2. Abraham, M. B., Gallego, P. H., Brownlee, W. M., Smith, G. J., Davis, E. A., & Jones, T. W. (2017). Reduced Prevalence of Impaired Awareness of Hypoglycemia in a Population-Based Clinic Sample of Youth with Type 1 Diabetes. *Pediatric Diabetes*, *18*(8), 729-733. doi:10.1111/pedi.12460
3. Barnett, N., Geelhoed, E., Davis, E., Jones, T. W., De Bock, M., & Norman, R. (2017). A Discrete Choice Experiment to Elicit Diabetes Treatment Preferences among Adolescents with Type 1 in Western Australia. *Value in Health*, *20*(9), A869. doi:10.1016/j.jval.2017.08.2539
4. Clapin, H., Hop, L., Ritchie, E., Jayabalan, R., Evans, M., Browne-Cooper, K., Peter, S., Vine, J., Jones, T. W., & Davis, E. A. (2017). Home-Based Vs Inpatient Education for Children Newly Diagnosed with Type 1 Diabetes. *Pediatric Diabetes*, *18*(7), 579-587. doi:10.1111/pedi.12466
5. Cooper, M. N., de Bock, M. I., Carter, K. W., de Klerk, N. H., Jones, T. W., & Davis, E. A. (2017). Incidence of and Risk Factors for Hospitalisations Due to Vascular Complications: A Population-Based Type 1 Diabetes Cohort (N=1316) Followed into Early Adulthood. *Journal of Diabetes and its Complications*, *31*(5), 843-849. doi:10.1016/j.jdiacomp.2016.11.022
6. Cooper, M. N., Lin, A., Alvares, G. A., de Klerk, N. H., Jones, T. W., & Davis, E. A. (2017). Psychiatric Disorders During Early Adulthood in Those with Childhood Onset Type 1 Diabetes: Rates and Clinical Risk Factors from Population-Based Follow-Up. *Pediatric Diabetes*, *18*(7), 599-606. doi:10.1111/pedi.12469
7. Craig, M. E., Prinz, N., Boyle, C. T., Campbell, F. M., Jones, T. W., Hofer, S. E., Simmons, J. H., Holman, N., Tham, E., Fröhlich-Reiterer, E., DuBose, S., Thornton, H., King, B., Maahs, D. M., Holl, R. W., & Warner, J. T. (2017). Prevalence of Celiac Disease in 52,721 Youth with Type 1 Diabetes: International Comparison across Three Continents. *Diabetes Care*, *40*(8), 1034. doi:10.2337/dc16-2508
8. Danne, T., Nimri, R., Battelino, T., Bergenstal, R. M., Close, K. L., DeVries, J. H., Garg, S., Heinemann, L., Hirsch, I., Amiel, S. A., Beck, R., Bosi, E., Buckingham, B., Cobelli, C., Dassau, E., Doyle, F. J., Heller, S., Hovorka, R., Jia, W., Jones, T., Kordonouri, O., Kovatchev, B., Kowalski, A., Laffel, L., Maahs, D., Murphy, H. R., Nørgaard, K., Parkin, C. G., Renard, E., Saboo, B., Scharf, M., Tamborlane, W. V., Weinzimer, S. A., & Phillip, M. (2017). International Consensus on Use of Continuous Glucose Monitoring. *Diabetes Care*, *40*(12), 1631. doi:10.2337/dc17-1600
9. Gibson, L. Y., Allen, K. L., Davis, E., Blair, E., Zubrick, S. R., & Byrne, S. M. (2017). The Psychosocial Burden of Childhood Overweight and Obesity: Evidence for Persisting Difficulties in Boys and Girls. *European Journal of Pediatrics*, *176*(7), 925-933. doi:10.1007/s00431-017-2931-y

10. Graf, A., Ward, G. M., Vogrin, S., Sundararajan, V., Sharifi, A., De Bock, M. I., Jayawardene, D., Loh, M. M., Horsburgh, J. C., Berthold, C. L., Paramalingam, N., Bach, L. A., Colman, P. G., Davis, E. et al (2017). Overnight Counter-Regulatory Hormone Levels and Next Day Glycemia in Adults with Type 1 Diabetes During Closed-Loop Insulin Delivery Versus Sensor-Augmented Pump with Low-Glucose Suspend. *Diabetes Technology & Therapeutics*, 19(7), 438-439. doi:10.1089/dia.2017.0049
11. Haynes, A., Hermann, J. M., Miller, K. M., Hofer, S. E., Jones, T. W., Beck, R. W., Maahs, D. M., Davis, E. A., Holl, R. W., for the T1D Exchange, W., & registries, D. P. V. (2017). Severe Hypoglycemia Rates Are Not Associated with Hba1c: A Cross-Sectional Analysis of 3 Contemporary Pediatric Diabetes Registry Databases. *Pediatric Diabetes*, 18(7), 643-650. doi:10.1111/pedi.12477
12. Marcovecchio, M. L., Chiesa, S. T., Bond, S., Daneman, D., Dawson, S., Donaghue, K. C., Jones, T. W., Mahmud, F. H., Marshall, S. M., Neil, H. A. W., Dalton, R. N., Deanfield, J., Dunger, D. B., & for the AdDIT Study Group. (2017). Ace Inhibitors and Statins in Adolescents with Type 1 Diabetes. *New England Journal of Medicine*, 377(18), 1733-1745. doi:10.1056/NEJMoa1703518
13. Miller, K. M., Hart, P. H., de Klerk, N. H., Davis, E. A., & Lucas, R. M. (2017). Are Low Sun Exposure and/or Vitamin D Risk Factors for Type 1 Diabetes? *Photochemical and Photobiological Sciences*, 16(3), 381-398. doi:10.1039/C6PP00294C
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INVITED SPEAKER ENGAGEMENTS

1. Jones, T.W. Invited Speaker. CGM – Clinical Challenges. Eli Lilly Directions in Diabetes. Sydney. July 2017.
2. Jones, T.W. Invited Speaker. Pump and CGM Technology. JDRF Performance, Exercise and Knowledge (PEAK) AUS Canberra, Australia. July 2017.
3. Jones, T.W. Invited Speaker. IHSG. Panel Discussion and presentation. San Diego, CA June 2017
4. Davis, E. A. JDRF Performance, Exercise and Knowledge (PEAK) AUS. Physiology. Canberra, Australia. July 2017
5. Davis, E. A. Eli Lilly Directions in Diabetes. ADA Highlights 4. Sydney Australia. July 2017
6. Jones, T.W. Invited Speaker. The AddIT trial: cardiorenoprotection in at risk adolescents with Type 1 Diabetes. ADS / ADEA Annual Scientific Meeting. Perth, August 2017.
7. Jones, T.W. Invited Speaker. Advances in Type 1 diabetes treatment including pumps, glucose monitoring, automated insulin delivery and new insulins. ADS / ADEA Annual Scientific Meeting. Perth, August 2017.
8. Davis, E. A. JDRF T1D Summit. Fitness, Nutrition and Lifestyle Tips for Carers of Children living with type 1 diabetes. Sydney Australia. September 2017
9. Davis, E. A. 10th International Meeting of Paediatric Endocrinology. Exercising Safely with T1D. Washington D.C. USA. September 2017
10. Davis, E. A. National Association Diabetes Centres (NADC) Best Practice in Diabetes Centres (BPDC) Symposium. Funding Pumps and CGMS. Sydney Australia. October 2017
11. Jones, T.W. Invited Speaker. Update on Technology. Novo Nordisk Endocrine and Diabetes Symposium. Perth, November 2017.
12. Jones, T.W. Invited Speaker. Roche. Exercise and Type 1 Diabetes: A practical Approach. Oslo, Norway. April 2018
13. Jones, T.W. Invited Speaker. T1D Technology and Closed Loop. ADEA WA State Conference 2018, Perth, April 2018
14. Jones, T.W. National Diabetes Week 2018. Invited speaker. Explore Diabetes Expo Diabetes Research. Wembley, Western Australia, July 2018
15. Davis, E.A. Invited speaker. Exercising safely with type 1 diabetes. EA-ADC Symposium on Hypoglycaemia, Adelaide, SA August 2018
16. Davis, E. A. National Association Diabetes Centres (NADC) Best Practice in Diabetes Centres (BPDC) Symposium. Technology and ANDS (Australian National Diabetes Strategy) will impact/assist with diabetes technologies. Sydney Australia. October 2018
17. Davis, E. A. Australian Diabetes Society (ADS) Aspects of Hypoglycaemia among children and adolescents with on a Symposium on hypoglycaemia. Adelaide Convention Centre. August 2018
18. Davis, E. A. Sri Lanka College of Paediatricians. Annual Scientific Congress of the Sri Lanka College of Paediatricians. Carbohydrate counting and diabetes in childhood Sri Lanka September 2018
19. Jones, T.W. Invited Speaker. EASD. Hypoglycaemia in children. Berlin, Germany. October 2018

INTERNATIONAL CONFERENCE PRESENTATIONS

1. Chetty T, Fried L, Roby H, Nicholas J, Jones TW, Cross D and Davis EA. Barriers to Exercise in Youth with T1D: Clinical Lessons Learnt from a Qualitative Analysis. ISPAD Innsbruck, Austria 2017
2. Ganti, U., Abraham, M., Shetty, V., de Bock, M., Curran, J., Siafarikas, A., Rao, S., Kikiros, C., Thomas, E., Davis, E., Jones, T., & Choong, C. Sirolimus Therapy for Persistent Hypoglycemia Following near-Total Pancreatectomy in an Infant with Congenital Hyperinsulinism. Paper presented at the 10th Individual Abstracts for International Meeting of Pediatric Endocrinology: Free Communication and Poster Sessions, Abstracts. Washington, USA 2017
3. Soon W, Guelfi K, Davis EA, Fournier P, Jones TW. Current recommended carbohydrate intake prior to intermittent high-intensity exercise does not result in unphysiological glycaemic excursions in type 1 diabetes under basal insulin conditions. ISPAD Innsbruck, Austria 2017
4. Mary B Abraham, Jennifer Nicholas, Martin de Bock, Grant Smith, Janice M. Fairchild, Bruce R. King, Geoffrey R. Ambler, Fergus J. Cameron, Elizabeth A. Davis, Timothy W. Jones on behalf of the PLGM study group. Reduction in hypoglycemia with the Predictive Low Glucose Management system: A multicenter randomized controlled trial. ADA San Diego, California 2017
5. Robertson C, Lin A, Strauss P, Nicholas J, Davis EA, Jones TW, Gibson L, Richters J, de Bock M. Behind Closed Doors: Technology and Intimacy in Type 1 Diabetes. ADA San Diego, California 2017
6. Fried L, Chetty T, Roby H, Nicholas J, Jones TW, Cross D and Davis EA. Barriers to Exercise in Youth with T1D: the Patient Experience ADA San Diego, California 2017
7. Barnett, N. Davis, EA. Jones, TW. de bock, M. Norman, R. Smith, G. Applying consumer choice theory to health technology assessments in Australia - a discrete choice experiment to elicit preferences among adolescent patients with type 1 diabetes. ATTD Paris 2017
8. Burckhardt, M, Smith, G, Cooper, MN, Jones, TW, Davis, EA. Long-term glycaemic control of children with type 1 diabetes on insulin pump therapy in a population based case-control study ATTD PARIS 2017
9. Chetty T, Burckhardt M, Smith G, Adolfsson P, de Bock M, Jones TW, Davis EA. Use of continuous glucose monitoring (CGM) trends to prevent hypoglycaemia during exercise in young children with type 1 diabetes. ATTD Vienna Austria, April 2018
10. Rothacker K, Armstrong S, Smith GJ, Benjanuvatran N, Lay BS, Fournier PA, Adolfsson P, Jones TW, Davis EA. Exercise Performance is Not Impaired By Hyperglycemia in Type 1 Diabetes. ADA Orlando, Florida 2018
11. Chetty T, Roby HC, Paramalingam N, Dart J, Brownlee W, Soon W, Smith G, Shetty V, Fournier P, Jones TW, Davis EA. Short Sprints During Exercise Reduce Exercise Mediated Hypoglycaemia in Type 1 Diabetes in a Real-Life Setting. ADA Orlando, Florida 2018
12. Burckhardt, M.-A., Roberts, A., Smith, G., Abraham, M., Davis, E., & Jones, T. Improved Quality of Life Metrics after Using Real-Time Continuous Glucose Monitoring with Remote Monitoring in Young Children with Type 1 Diabetes. Paper presented at the Official Journal of ATTD Advanced Technologies & Treatments for Diabetes Conference, Austria, Vienna—February 14–17, 2018.
13. Paramalingam N, Chetty T, Soon WHK, Roberts AG, O’Dea JM, Keating BL, Shetty VB, Jones TW, Fournier PA, Davis EA. Dietary Protein Intake In The Evening Reduces The Risk Of Overnight Late Onset Post Exercise Hypoglycaemia. ISPAD India 2018
14. Chetty T, Roby HC, Paramalingam N, Dart JA, Brownlee WJ, Soon WHK, Shetty V, Fournier PA, Jones TW and Davis EA. Short Sprints During Exercise to Reduce Hypoglycaemia in Type 1 Diabetes: A Free-Living Randomised Controlled Trial. ISPAD India 2018

NATIONAL CONFERENCE PRESENTATIONS

1. Robertson C, Lin A, Strauss P, Nicholas J, Davis EA, Jones TW, Gibson L, Richters J, de Bock M. Behind Closed Doors: Technology and Intimacy in Type 1 Diabetes ADS-ADEA Perth WA 2017
2. Evans M, Smart CE, Keating B, Paramalingam N, Smith G, Jones TW, King BR, Davis EA. What is the quantity of additional insulin required for meals high in fat and protein? ADS-ADEA Perth WA September 2017.
3. Burckhardt M, Hancock M, Nicholas JA, Roberts A, Abraham MB, Davis EA, Jones TW. Parents experiences of using Real-Time Continuous Glucose Monitoring with remote monitoring in young children with type 1 diabetes. ADS-ADEA Perth WA September 2017
4. Nicholas JA, Abraham M, Crone M, Ly T, Davis EA, Jones TW. The Hawthorne effect unveiled in a randomised controlled trial. ADS-ADEA Perth WA September 2017
5. Soon W, Guelfi K, Davis EA, Fournier P, Jones TW. Current recommended carbohydrate intake prior to moderate intensity exercise with or without repeated sprints does not result in unphysiological glycaemic excursions in type 1 diabetes. ADS-ADEA Perth WA September 2017
6. Chetty T, Fried L, Roby HC, Nicholas J, Jones TW, Cross D, Davis EA. Psychosocial Barriers to exercise in youth with T1D. ADS-ADEA Perth WA September 2017
7. Chetty T, Burckhardt M, Smith G, Adolfsson P, de Bock M, Jones TW, Davis EA. Use of continuous glucose monitoring directional trends to prevent hypoglycaemia during exercise in young children with type 1 diabetes. APEG ASM Hobart, Tasmania November 2017
8. Burckhardt M, Roberts A, Smith G, Abraham MB, Davis EA, Jones TW. Improved markers of quality of life after using real-time continuous glucose monitoring in young children with type 1 diabetes. APEG ASM Hobart, Tasmania November 2017
9. Abraham MB, Nicholas J, Smith G, Fairchild J, King B, Ambler G, Cameron F, Davis EA, Jones TW on behalf of the PLGM study group. Reduction in hypoglycaemia with the Predictive Low Glucose Management System in children with type 1 diabetes. APEG ASM Hobart, November Tasmania 2017
10. Abraham MB, Smith G, Nicholas J, Fairchild J, King B, Ambler G, Cameron F, Davis EA, Jones TW on behalf of the PLGM study group. Characteristics of automated insulin suspension and glucose responses with predictive low glucose management system. APEG ASM Hobart, Tasmania November 2017
11. Abraham MB, Nicholas J, Smith G, Fairchild J, King B, Ambler G, Cameron F, Davis EA, Jones TW. Reduction in hypoglycaemia with the Predictive Low Glucose Management System in children with type 1 diabetes. CAHS Perth October 2017
12. Rothacker K, Armstrong S, Smith GJ, Benjanuvatran N, Lay BS, Fournier PA, Adolfsson P, Jones TW, Davis EA. Minimal Impact of Acute Hyperglycaemia on Exercise Performance in Recreationally Active Young People with Type 1 Diabetes. ADC Adelaide, SA August 2018
13. Paramalingam N, Chetty T, Soon WHK, Roberts AG, O'Dea JM, Keating BL, Shetty VB, Jones TW, Fournier PA, Davis EA. Evening Protein Intake Reduces the Risk of Nocturnal Exercise Mediated Hypoglycaemia. Child Health Symposium Perth, WA August 2018
14. Chetty T, Roby HC, Paramalingam N, Dart J, Soon W, Smith G, Fournier P, Jones TW, and Davis EA. Sprints During Exercise Reduce Exercise Mediated Hypoglycaemia in Type 1 Diabetes. Child Health Symposium Perth, WA August 2018
15. Soon WHK, Abraham MA, Smith GJ, Fournier PA, Paramalingam N, Shetty VB, Jones TW, Davis EA. Reproducibility of blood glucose responses to exercise in Type 1 diabetes. Child Health Symposium Perth, WA August 2018

SEEDING GRANTS AWARDED BY THE CHILDREN'S DIABETES CENTRE

2017

Dr Tarini Chetty. Practical use of continuous glucose monitoring during exercise to improve time spent in target glucose range. \$18,426

Dr Aveni Haynes. How is birth by caesarean section delivery associated with the risk of childhood type 1 diabetes? \$14,793.31

Zac Leow. Effect of ketogenic low carbohydrate diets on hypoglycaemia threshold and symptoms in adults with type 1 diabetes mellitus \$18,901

Jennifer Nicholas. Health Literacy: Implications and interventions for adolescents and young adults with type 1 diabetes. \$20,000

2018

Dr P. Gerry Fegan. Improving Dyslipidaemia Education and Awareness in Type 1 Diabetes (IDEA-T1D). \$19,850

Dr Keely Bebbington. Knowledge, attitudes and practices related to the transition of emerging adults with type 1 diabetes from paediatric to adult care in Western Australia. \$18,809

Cory Dugan. The effect of acute hypoxia on the rate of fall in blood glucose levels and carbohydrate oxidation rates during moderate intensity exercise in individuals with type 1 diabetes \$17,211

TRAVEL AWARDS PROVIDED BY THE CHILDREN'S DIABETES CENTRE

Wayne Soon	Australian Diabetes Society (ADS) meeting 2017 - Perth \$620
Dr Aveni Haynes	International Diabetes Epidemiology Group (IDEG) conference 2017 - Abu Dhabi \$3000
Dr Leanne Fried	International Society for Paediatric and Adolescent Diabetes (ISPAD) conference 2017 – Innsbruck \$2811
Helen Clapin	Australasian Paediatric Endocrine Group (APEG) November 2017 – Hobart \$1,846
Matt Cooper	International Diabetes Federation (IDF) 2018 – Abu Dhabi \$471
Wayne Soon	International Society Paediatric and Adolescent Diabetes (ISPAD) 2018 – Hyderabad \$1541
Dr Aveni Haynes	International Society Paediatric and Adolescent Diabetes (ISPAD) 2018 – Hyderabad \$2013
Joanne O’Dea	International Society Paediatric and Adolescent Diabetes (ISPAD) 2018 – Hyderabad \$2177

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Photo: Professor Elizabeth Davis and Professor Tim Jones with some of our families

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www.childrensdiabetescentre.org.au

For more information please contact Tanyana Jackiewicz, Senior Program Manager, Children's Diabetes Centre on 6456 4616 or by email Tanyana.Jackiewicz@health.wa.gov.au