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WELCOME

On behalf of the organising committee, I would like to warmly welcome you all to Adelaide. It has been a pleasure to be involved in developing the clinical program and I hope that you will thoroughly enjoy every aspect of the conference.

Our key note speaker is Prof Boyd Metzger, principal investigator of HAPO study, who will share from his breadth of knowledge and extensive clinical experience. I take this opportunity to thank him for travelling all the way from the US and look forward to an insightful presentation.

I would like to thank all our invited speakers for their time and contribution to make this a valuable meeting for everyone. A special thanks to all those who volunteered to present their models of care at the conference. We received over 60 high quality abstracts and I would strongly encourage everyone to visit the posters.

This meeting would not have been possible without the valuable support of the team at ASN events, our Executive Officer Suzie Neylon, and our local organising committee. I would like to extend my gratitude to those who have kindly agreed to chair the various sessions, and the judges of the oral and poster presentations. I would also like to thank our sponsors and exhibitors for their support.

I hope ADIPS 2018 will be a fun, educational and enjoyable meeting for all.

Dr Julie Chemmanam
Australasian Diabetes in Pregnancy Society ASM Convenor

The conference acknowledges the support of: Medtronic

LOCAL ORGANISING COMMITTEE

CONVENOR

Julie Chemmanam | Endocrinologist and Obstetric Physician, *Women's and Children's Hospital*

Jui Ho | Endocrinologist and Staff Specialist, *Flinders Medical Centre*

Shantha Joseph | Endocrinologist and Obstetric Physician, *Flinders Medical Centre*

Jillian Lyon-Green | Nurse Consultant-Diabetes, CDE, *Lyell McEwin Hospital*

Sandra Palazzo | Endocrine Dietitian, *Lyell McEwin Hospital*

ADIPS SECRETARIAT

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CONFERENCE SECRETARIAT

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INFORMATION FOR DELEGATES AND PRESENTERS

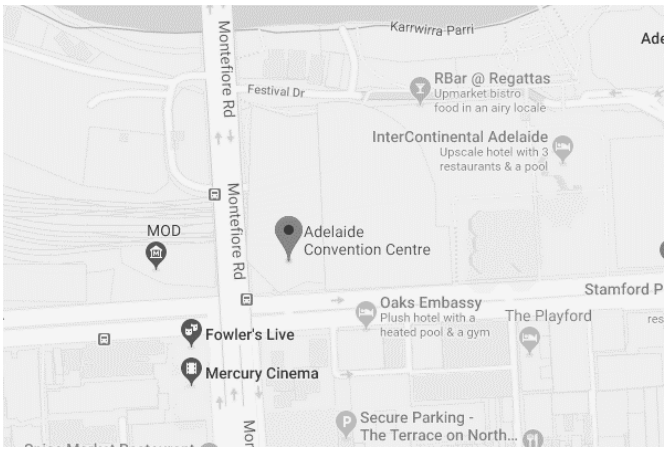
Venue Directory

Adelaide Convention Centre

North Terrace,
Adelaide SA 5000
Ph: +61 8 8212 4099

Web address: www.adipsasm.org

Location	Item
Panorama Ballrooms 1&2	Sessions
Panorama Ballroom Foyer	Exhibition, Poster Display, Catering



Registration Desk

The registration desk is located just in the Foyer just outside the Panorama Ballrooms.

Operation Times:

- Friday 24th August 2017 8:00am – 5:30pm
- Saturday 25th August 2017 8:00am – 5:00pm
- Sunday 26th August 2017 8:00am – 1:00pm

All conference related enquires should be directed to ASN Events staff at this desk.

Onsite Conference Managers:

Katharina Bekemeier
ASN Events
Email: kb@asnevents.net.au
Mobile: +61 487 632 333

Registration Inclusions

Delegates will receive the following goods and services as part of their registration:

- Access to the sessions of your choice
- Conference satchel complete with conference program booklet
- Morning and/or afternoon tea for the days of nominated attendance
- Lunches on the days of nominated attendance
- Ticket to the Welcome Function (booking required)
- Use of the conference app
- Complimentary Wi-Fi

Welcome Function

The Welcome Reception will be held on Friday the 24th August from 4:15pm to 5:30pm at the Adelaide Convention Centre, Panorama Foyer. If you haven't booked a ticket, please see the registration desk to see if there are still places available.

Conference Dinner – CRAZY HAT THEME

The conference dinner is without a doubt one of the highlights of the meeting. Come and celebrate at the Electra House Adelaide on Saturday, the 25th August from 7:00pm until 11:00pm. Make sure to bring your own crazy hat or craft a new one next to the registration desk and bring it to the dinner! If you haven't booked a ticket, please see the registration desk to see if there are still places available.

Speaker Preparation

Presentations are to be loaded directly onto the PC within the room in which they are presented in, as early as possible, however no later than at the beginning of the break prior to their session. You should bring your talk on a USB, saved in a format for display on a PC within the room. An ASN representative or AV technician will be on hand to assist with transfer / loading issues and to help you check your presentation. There are no Macintosh computers in the presentation rooms; however, you can bring your own and present from it provided you bring the appropriate conversion cables.

Poster Presentations

Poster viewing will be during the Welcome function on Friday from 4:15pm until 5:30pm. Posters can be displayed from Friday morning tea and must be taken down by morning tea on Sunday. The approved way of attaching your poster is with Velcro, which will be provided on your poster board.

Nametags

Delegates are required to wear their nametags to all scientific and catered sessions.

iPhone/Android Conference Web-App

The App is displayed in a simple and easy to read format on your phone, iPad, or even your computer. To get the 'App', please open the below link in your internet browser on your smart phone, iPad or laptop.

http://adips-2018.m.asnevents.com.au/

You will be prompted to add an icon onto your device home screen. The 'App' will allow you to:
- View the full conference program
- View all abstracts for the conference
- Save your favorite sessions and plan your day
- Take notes which will then be saved and downloaded from your registration profile
- To participate in live polling during the sessions

To use most of these functions, you will be prompted to 'log in" each day. Simply enter the same email & password which you used to register.

Wi-Fi

Complimentary Wi-Fi is available for delegates within the conference areas for the duration of the conference. The Wi-Fi connection is suitable for the viewing of emails and browsing. Downloading images and movies is not recommended.

How to connect:

1. Please connect to the following Network: **ACC_Free**
2. Once selected, you will be redirected to a splash page
3. Provide information required and connect
4. Start using internet

Special Meal Requests

If you have nominated for a special meal (dietary requirements, vegetarian, etc.) please identify yourself to the hotel staff. All requests have been passed onto the hotel and will be catered for accordingly.

Smoking

Smoking is not permitted in the venue.

Mobile Phones

Please ensure your mobile phone is turned to silent during any session you attend.

Insurance

The hosts and organizers are not responsible for personal accidents, any travel costs, or the loss of private property, and will not be liable for any claims. Delegates requiring insurance should make their own arrangements.

Disclaimer

The hosts, organizers and participating societies are not responsible for, or represented by, the opinions expressed by participants in either the sessions or their written abstracts.

INVITED SPEAKERS

International Speaker

Prof Boyd Metzger

Northwestern University, Chicago, USA

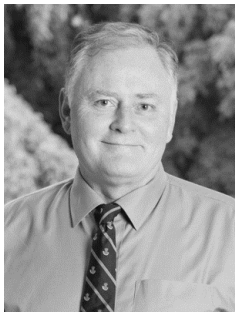
Boyd Metzger, M.D. is the Tom D Spies Emeritus Professor of Nutrition and Metabolism in the Division of Endocrinology, Metabolism & Molecular Medicine, Department of Medicine at Northwestern University Feinberg School, Chicago, IL. Metzger was an undergraduate at the University of South Dakota and earned his M.D. at University of Iowa. He was Intern, Medical Resident and Clinical Fellow in Metabolism at Michael Reese Hospital in Chicago and a Postdoctoral Fellow in Biological Chemistry at Washington University in St Louis. Dr. Metzger has had "career-long" research and clinical interests in diabetes-related disorders. He headed Northwestern University's Clinical Center of the Type 2 Diabetes Prevention Program. For decades, he has investigated the impact of gestational diabetes mellitus, preexisting diabetes and states of altered nutrition during pregnancy on intrauterine, perinatal and lifelong health of offspring. He has served on editorial boards of Diabetes and Diabetologia and was a member of the Organizing Committee of all five ADA sponsored International Workshop Conferences on gestational diabetes mellitus and Chairman and Proceedings Editor of the last three. He was the Principal Investigator of the NICHD/NIDDK funded "Hyperglycemia & Adverse Pregnancy Outcome (HAPO) study and chaired the International Association of Diabetes and Pregnancy Study Groups (IADPSG) Consensus Panel that developed new recommendations for diagnosis and classification of hyperglycemia in pregnancy. He is also Principal Investigator of the recently completed, NIDDK/NICHD funded HAPO Follow Up Study that examined associations of intrauterine metabolism with long term outcomes in mothers and children.

National Speakers

Dr Helen Barrett

The University of Queensland

Dr Helen Barrett is an Obstetric Physician and Endocrinologist and is Director of Endocrinology & Diabetes at the Mater Hospital, Brisbane. She is a Senior Lecturer within the Faculty of Medicine at The University of Queensland. Dr Barrett has a strong interest in improving the outcomes of complicated pregnancy, with a particular focus on maternal obesity and diabetes in pregnancy. Her PhD examined the role of maternal lipids and placental lipid processing in the outcomes of pregnancy for women with diabetes. Dr Barrett currently holds an NHMRC Early Career Research Fellowship and her current research continues to explore maternal and placental metabolism in complicated pregnancy, with emphasis on the role of the microbiome.



Prof David McIntrye

Mater Health Services | University of Queensland

Professor David McIntyre trained in Endocrinology in Australia and Belgium. He maintains an active clinical profile as Director of Obstetric Medicine at Mater Health Services. He is Head of the Mater Clinical Unit at the University of Queensland. David has published over 160 papers (>8000 citations), primarily in the field of medical complications of pregnancy with a focus on diabetes and obesity. Recent research studies have examined the effects of diabetes, obesity and high blood pressure during pregnancy on the health of Mothers and Babies, both during pregnancy and with long term follow up. David is the Immediate Past Chair of the International Association of Diabetes in Pregnancy Study Groups (IADPSG). In 2016, he became the first Australian trained clinician to receive the Norbert Freinkel Award for contributions to diabetes in pregnancy from the American Diabetes Association. David has been closely involved in the translation of clinical research findings into clinical practice, in particular through the re definition of gestational diabetes and promotion of intensive insulin therapy in Type 1 diabetes through the DAFNE programme.

A/Prof Louise Hull

The University of Adelaide

Associate Professor M. Louise Hull is a gynaecologist and reproductive medicine physician with a biomedical science background. She leads the Endometriosis Research Group at the Robinson Research Institute (www.adelaide.edu.au/directory/louise.hull) and the Implantation Special Interest Group for the Asia Pacific initiative for Reproductive Medicine (ASPIRE). Dr Hull works at Women's and Children's Hospital and in private practice at O and G in North Adelaide. Dr Hull's practice focuses on improving fertility and early pregnancy outcomes for women with implantation problems. Recently she has explored the impact of disorders of glucose metabolism on implantation and miscarriage in clinical practice. Assoc Prof Hull co-founded the FertilitySA IVF unit and was their scientific and new developments director. She supervises PhD students, medical students, chairs the AGES grant committee, is deputy chair of the RANZCOG grant committee and was an Associate Editor for Human Reproduction. She is an International ambassador for the World Congress of Endometriosis (www.endometriosis.ca/about/ambassador/louise-hull).

Dr Susan de Jersey

Royal Brisbane and Women's Hospital

Dr Susie de Jersey is an Advanced Accredited Practicing Dietitian and the Principal Research Fellow for Allied Health Professions at the Royal Brisbane and Women's Hospital, and a Visiting Research Fellow in the School of Exercise and Nutrition Sciences at Queensland University of Technology. She is an early career clinical researcher who has completed undergraduate degrees in nutrition and dietetics, human movement studies, and a Master of Public Health. Susie has over 17 years of clinical experience both in Australia and the UK across the health care continuum. Susie's clinical expertise and research is in the area of maternal health particularly the management diabetes and weight in pregnancy. Susie supports a number of clinical dietitians and higher research degree students to support women achieve healthy lifestyles in pregnancy, ensuring appropriate dietary prescription and innovative models of care.

A/Prof Michael Stark

The University of Adelaide

A/Prof Michael Stark is a Senior Staff Specialist in Neonatal Medicine at the Women's and Children's Hospital Adelaide and co-leads the Early Origins of Health Research Theme in The Robinson Research Institute, School of Medicine, University of Adelaide. He undertook his paediatric and perinatal training in the UK and Australia completing his PhD on placental steroid metabolism and its impact on early neonatal cardiovascular transition in 2008. Since 2010 he has lead the multi-disciplinary neonatal research group within the RRI which focuses in fetal physiological adaptations to pathological pregnancy and their consequence for early neonatal health and the impact of common interventions during the neonatal period on later health, particularly programmed immune function.

Dr Shilpa Jesudason

The University of Adelaide

Shilpa Jesudason (MBBS, FRACP, PhD) is a Staff Specialist Nephrologist, Central Northern Adelaide Renal and Transplant Service and Consulting Physician at the Women's and Children's Hospital. She runs an Obstetric Nephrology Clinic for pre-conception counselling, antenatal care and post-partum follow up of women with renal disorders, and counselling for men with renal failure. Her pregnancy-related research program explores parenthood outcomes for women and men with kidney disease. She is lead investigator for the national AMOSS Kidney Disease in Pregnancy study. She works with the ANZDATA Dialysis and Transplant registry regarding collecting and analysing parenthood data. She founded and Chairs the CNARTS Clinical Research Group which conducts a range of multidisciplinary research projects addressing patient centred outcomes for patients with renal failure. She is the National Clinical Director of Kidney Health Australia (formally the Australian Kidney Foundation), the peak consumer organisation for patients with kidney disease.

Dr Joanne Judd

Flinders Medical Centre

Jo Judd works as a Cardiologist at Flinders Medical Centre where she specialises in women's cardiovascular health, and in particular the management of cardiac conditions in pregnancy. These include issues such as rheumatic and congenital heart disease, hypertension and pre-eclampsia, and peri-partum cardiomyopathy. She also works as a general cardiologist and is interested in all aspects of clinical cardiology including preventative management. She undertakes procedures in stress and transoesphageal echo, working at Heart and Vascular, Flinders Private Hospital, Wakefield Hospital and visits Mt Gambier hospital each month.

Prof Jamie Craig

Ophthalmologist, Adelaide

Prof Jamie Craig is a Consultant Ophthalmologist specializing in the care of glaucoma patients. He is a clinician-scientist with a strong track record in clinical and genetic research. As a NHMRC Practitioner-Fellow, he seeks to translate his laboratory-based research into clinical practice. Specific research interests include the genetic susceptibility to all forms of glaucoma, congenital cataract, and diabetic retinopathy. He has skills in clinical diagnosis and disease management, as well as having made important discoveries on the genetic etiology of glaucoma and other ocular conditions. He is experienced in patient recruitment, and has pioneered strategies to develop a National Registry of cases with extremely severe vision loss from glaucoma: The Australian and New Zealand Register of Advanced Glaucoma (ANZRAG). This work has led to genome-wide association studies for identification of genes associated with glaucoma susceptibility. A similar approach is now underway for blindness due to diabetic retinopathy: Registry of Advanced Diabetic Retinopathy in Australia (RADAR). Having completed a D.Phil. in the analysis of complex traits by genome wide linkage approaches, he maintains a detailed understanding of strategies to enhance power by careful case selection, and the utilization of clinical information to refine analyses. Being responsible for direct patient care, he attaches a high priority to applying research outcomes to better models of patient care.

Dr Sue Mei Lau

Royal Hospital for Women | Prince of Wales Hospital, Sydney

Sue Mei is a staff specialist endocrinologist and on-call physician at the Royal Hospital for Women, and Acting Director of the Department of Diabetes and Endocrinology at Prince of Wales Hospital in Sydney. Sue Mei has a strong clinical and research interest in diabetes in pregnancy and enjoys working with pumps in pregnancy in public and private practice. Her PhD examined the effects of diabetes in pregnancy on offspring metabolic health during the lifespan, and she has since continued to study the effects of maternal diabetes on offspring, as well as the role of the immune system in GDM.

Dr Winnifred Lee

Endocrinologist | Obstetric physician, Brisbane

Dr Winnifred Lee is an endocrinologist and obstetric physician in private practice in Brisbane. She works at the Mater Mothers' Hospital in Brisbane, one of the largest maternity hospitals in Australia. She has been involved in insulin pump therapy in pregnant patients for more than ten years, currently helping at least 10-15 patients per year deliver using insulin pumps. She will give practical insights into using insulin pumps to optimise pregnancy outcomes for women with diabetes. There will be guidelines provided on appropriate adjustments throughout pregnancy and peripartum.

Bec Humphreys

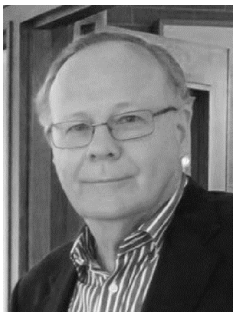
North East Diabetes

Rebecca is a Credentialed Diabetes Educator located in North East Victoria. Her career started at the Royal Children's Hospital in Melbourne, as a Paediatric Diabetes Educator in 2004. After moving to the North East Rebecca has been working in Private Practice and at Albury Wodonga Health. In 2011 she commenced working with Dr Robert Krones and together they have established an insulin pump service. They now have approximately 160 people using insulin pumps and manage women with Type 1 Diabetes in Pregnancy. Rebecca has an interest in insulin pump therapy and continuous glucose monitoring technology.

Janet Lagstrom

Diabetes Nurse Practitioner

Janet's interest in diabetes began 30 years ago, sharing house with a guy with Type 1 DM, working on the mines, fly in fly out. After relying on urine testing: a glucometer result of 17mmol/L, instigated further education for both … A passion for helping people with diabetes, Janet has instigated /contributed to the development of resources such as the GDM video; Diabetes and Pregnancy CD Rom; Booklets: Can I have a healthy baby, Sick day Management for Type 1 and 2 diabetes; Postnatal /breastfeeding advice for women with pre existing diabetes and an advocate of lifelong follow up of women who have had GDM. Janet now works in Private Practice as a Diabetes Nurse Practitioner in Wangaratta, Yarrawonga and Corowa, is on Staff at Deakin University, in addition to working at Numurkah District Health Service as a CDE. Current focus is improving Access to Diabetes And Diabetes via Technology (ADaPT) - to enable pregnant women with diabetes: Local Care choices.



Dr Ian Fulcher

Liverpool Hospital

Dr Ian Fulcher is an Obstetrician and Gynaecologist at Liverpool Hospital, Sydney and Bathurst, NSW. He obtained his Membership of the Royal College of Obstetricians and Gynaecologists in the UK where he worked at Bristol and Nottingham, and then returned to Australia where he obtained his Fellowship of the Royal Australian and New Zealand College of Obstetricians and Gynaecologists. Dr Fulcher has a strong interest in improving the outcomes of complicated pregnancy particularly those with medical disorders in pregnancy, and in improving the skillset of obstetric trainees. He established the multidisciplinary complex antenatal clinic at Liverpool Hospital over 20 years ago, and was instrumental in establishing the case discussion meetings there. He has been a member of ADIPS and SOMANZ for over 20 years, and on ADIPS Board since 2016.

Models of Care Presenters

Cecilia Astorga	Liverpool Health Service, Liverpool
Alison Barry	QLD Health
Linda Burcher	SALHN Acute Diabetes Service
Dr Thomas Cade	Royal Women's Public Hospital | St Vincent's Private Hospital | University of Melbourne
Prof Jeff Flack	Bankstown-Lidcombe Hospital, Bankstown
Dr Ruth Hughes	Canterbury District Health Board
Tara Jones	Goulburn Valley Diabetes Centre
Cathy Latino	Fiona Stanley Hospital
Dr Ana McCarthy	Northern Adelaide Local Health Network
Catharine McNamara	Mercy Hospital
Marina Mickleson	King Edward Memorial Hospital
Prof Christopher Nolan	Canberra Hospital | Australian National University Medical School
Dr Rohit Rajagopal	Campbelltown Hospital

Debaters

Affirmative Team

Dr Sarah Price	Melbourne Health| Royal Women's Hospital |Mercy Hospital for Women | University of Melbourne
Jillian Lyon-Green	Lyell McEwin Hospital, Adelaide
Prof Geoff Thompson	Women's and Children's Hospital | University of Adelaide, Adelaide
Dr Peter Muller	Women's and Children's Hospital, Adelaide

Negative team

Dr Sarah Glastras	Royal North Shore Hospital, Sydney
Hazel Grigg	Women's and Children's Hospital, Adelaide
Dr Sanjay Sinhal	Flinders Medical Centre, Adelaide
Simon Kane	Lyell McEwin Hospital, Adelaide

PROGRAM

Friday, 24th August 2018

Registration Open
8:00am — Panorama Ballroom Foyer

Welcome
8:45am - 9:00am — Panorama Rooms 1&2

The road to tread - Pre-conception to a healthy baby
9:00am – 10:30am — Panorama Rooms 1&2
Chair: Ian Fulcher

9:00am **A/Prof Louise Hull**
Fertility and preconception care in women with diabetes *abs# 1*

9:30am **Dr Susan de Jersey**
Searching for utopia: defined dietary prescription and medical nutrition therapy for gestational diabetes management *abs# 2*

10:00am **A/Prof Michael Stark**
Maternal hyperglycaemia in pregnancies: Effect of maternal management on the newborn and uncertainties surrounding best approaches to neonatal management *abs# 3*

Morning Tea
10:30am - 11:00am — Panorama Ballroom Foyer

ADS/ADIPS Skip Martin Conjoint Plenary Lectures
11:00am - 1:00pm — Panorama Rooms 1&2
Chairs: Leonie Callaway & Glynis Ross

11:00am **Prof Boyd Metzger**
Diabetes & Pregnancy: A Personal Perspective Formed Over a 50 Years Career *abs# 4*

12:00pm **Dr Helen Barrett**
Glucocentricity in pregnancy: ignoring other metabolic targets? *abs# 5*

Lunch
1:00pm - 2:00pm — Panorama Ballroom Foyer

Oral Presentations 1
2:00pm - 3:30pm — Panorama Rooms 1&2
Chairs: Ruth Hughes & Sandra Palazzo

2:00pm **Sarah Price**
Health consequences for mother and baby of substantial pre-conception weight loss in women with obesity: Interim analysis of 'time to conception' data *abs# 7*

2:10pm **Danielle Schoenaker**
Women with childhood trauma who develop depression prior to pregnancy are at increased risk of developing gestational diabetes *abs# 6*

2:20pm **Thomas Cade**
Impact of new criteria for the diagnosis of gestational diabetes A maternal and neonatal health outcome and economic analysis in a large tertiary level maternity centre *abs# 8*

The conference acknowledges the support of: Medtronic

2:30pm **Emma Jamieson**
Implementation in the real world: OGTT failing to detect women at risk of GDM-related adverse birth outcomes *abs# 9*

2:40pm **Maryam Sina**
Is diagnosis and treatment of gestational diabetes earlier than 20 weeks associated with adverse outcomes? *abs# 10*

2:50pm **Roisine Warwick**
Managing Gestational Diabetes Mellitus with the M♡THer App and Interactive Internet based Clinician Portal (Internet-Based) *abs# 11*

3:00pm **Anne Harrison**
Exercise improves glycaemic control in women diagnosed with gestational diabetes mellitus: a systematic review *abs# 12*

3:10pm **Katherine Tonks**
Individualised multidisciplinary management of gestational diabetes with protocolised frequent follow-up results in fewer neonatal special care nursery admission in private practice. *abs# 13*

3:20pm **Natassia Rodrigo**
Predictors of Pharmacotherapy Choice in Women with Gestational Diabetes *abs# 14*

ADIPS Guidelines and DIP Clinical Audit
3:30pm – 4:00pm Panorama Rooms 1&2
Chair: Janet Lagstrom

3:30pm **Dr Victoria Rudland** ADIPS Guidelines *abs# 32*
3:45pm **Prof David Simmons** DIP Clinical Audit *abs# 33*

ADIPS Annual General Meeting
4:00pm – 4:30 pm Panorama Rooms 1&2

Poster presentations and welcome drinks
4:15pm – 5:30 pm Panorama Ballroom Foyer

Saturday, 25th August 2018

Plenary Lecture
8:30am - 9:30am Panorama Rooms 1&2
Chair: David McIntyre

8:30am **Prof Boyd Metzger**
HAPO AND HAPO FUS: Implications for the Diagnosis of Gestational Diabetes *abs# 15*

GDM diagnosis – time for (another) change?
9:30am - 11:00am Panorama Rooms 1&2
Chair: Chris Nolan

9:30 AM **Prof David McIntyre**
Introduction – Current Australian criteria / NZ criteria. Time for review? *abs# 16*

9:55 AM **Prof David Simmons**
Some International perspectives regarding changing the criteria for GDM. *abs# 17*

10:10 AM **Janet Lagstrom**
Midwife / Diabetes Educator perspective. View from the trenches… How are we managing workload issues? *abs# 18*

10:20 AM **Dr Ian Fulcher**
Obstetrician perspective. *abs# 19*
10:30 AM ***All speakers***
Questions / Structured panel discussion

Morning Tea
11:00am - 11:30am Panorama Ballroom Foyer

Diabetes complications and pregnancy
11:30am - 1:00pm Panorama Rooms 1,2&3
Chair: Victoria Rudland

11:30am **Dr Shilpa Jesudason**
Diabetic nephropathy and pregnancy *abs# 20*
12:00pm **Dr Joanne Judd**
Cardiomyopathy and pregnancy *abs# 21*
12:30pm **Prof Jamie Craig**
Retinopathy and pregnancy *abs# 22*

Lunch
1:00pm – 2:00pm Panorama Ballroom Foyer

Insulin pumps and CGM
2:00pm – 3:30pm Panorama Rooms 1&2
Chairs: Glynis Ross & Shantha Joseph

2:00pm **Dr Sue Mei Lau**
Should we recommend insulin pumps and CGM in pregnancy? *abs# 23*
2:30pm **Dr Winnifred Lee**
Practical tips on managing women on insulin pumps and CGM *abs# 24*
3:00pm **Rebecca Humphreys**
Nuts and bolts of pumps and CGM *abs# 25*

Afternoon Tea
3:30pm – 4:00pm Panorama Ballroom Foyer

Debate: Insulin should be the first choice for treatment of GDM when MNT fails
4:00pm – 5:00pm Panorama Rooms 1&2
Chair: Bill Jeffries

Affirmative team	**Negative team**	
▪ Sarah Price	▪ Sara Glastras	Endocrinologist
▪ Jillian Lyon-Green	▪ Hazel Grigg	Diabetes Educator
▪ Geoff Thompson	▪ Sanjay Sinhal	Paediatrician
▪ Peter Muller	▪ Simon Kane	Obstetrician

Conference Dinner – Crazy Hat Theme
7:00 pm – 11:00pm Electra House Adelaide

Sunday, 26th August 2018

Models of care for Diabetes in Pregnancy

8:15am –9:45am Panorama Rooms 1&2

Chair: David McIntyre

- Ruth Hughes
- Cecilia Astorga
- Alison Barry
- Linda Burcher
- Thomas Cade
- Jeff Flack
- Tara Jones
- Cathy Latino
- Ana McCarthy
- Catharine McNamara
- Marina Mickleson
- Christopher Nolan
- Rohit Rajagopal

Morning Tea

9:45 am - 10:15am Panorama Ballroom Foyer

Oral Presentations 2

10:15am – 11:45am Panorama Rooms 1&2

Chairs: Helen Barrett & Jillian Lyon-Green

10:15am **David McIntyre**
Heterogeneity in insulin sensitivity and insulin secretion in gestational diabetes mellitus relates to differences in pregnancy outcomes *abs# 26*

10:30am **Neoma Withanawasam**
Comparison of the Oral Glucose Tolerance Test and HbA1C as a diagnostic screening tool for Gestational Diabetes *abs# 27*

10:45am **Jincy Immanuel**
The influence of maternal age, booking body mass index, and ethnicity on the prevalence of booking gestational diabetes mellitus. Preliminary findings from a multicenter randomized controlled trial *abs# 28*

11:00am **Nely Shrestha Khatri**
Prophylactic aspirin and fetal growth in diabetic pregnancies *abs# 29*

11:15am **Katharine Gupta**
Should women with diabetes in pregnancy (DIP) undergoing elective caesarean section after 37 weeks receive pre-operative corticosteroids? *abs# 30*

11:30am **Doug Symonds**
Impact of continuous glucose monitoring on perinatal costs and outcomes in pregnant women with type 1 diabetes: A cost analysis based on the outcomes of the CONCEPTT trial. *abs# 31*

Complex Case Discussion – Multidisciplinary Panel

11:45am – 12:30pm Panorama Rooms 1&2

Chair: Leonie Callaway

11:45am Case Presentation by Madeline Duke
Panellists:

- Jeremy Oats
- Robert Moses
- Elise Gilbertson
- Geoff Thompson
- Alison Barry

Awards Presentation, concluding remarks and meeting close

12:30pm – 1:00pm | Panorama Rooms 1&2

Lunch

1:00 pm - 1:30pm | Panorama Ballroom Foyer

The conference acknowledges the support of: Medtronic

POSTER LISTING

Adil Bahauddin
An Audit of the impact of a structured document (Proforma) on the quality of patient care in diabetes in pregnancy clinic at Campbelltown Hospital *abs# 100*

N Wah Cheung
A Pilot Randomised Controlled Trial of Text Messaging and Activity Monitors to Improve Health Behaviour After Gestational Diabetes *abs# 101*

Sheng-Tsung (Dominique) Chiu
Subcutaneous insulin protocol following antenatal steroids for women with diabetes in pregnancy *abs# 102*

Shamil D Cooray
Attitudes to Diet and Exercise in Women Attending Gestational Diabetes Services with an Examination of the Impact of Culturally and Linguistically Diverse Backgrounds *abs# 103*

Susan de Jersey
A cross-sectional survey of gestational diabetes management in Queensland *abs# 104*

Susan de Jersey
Increased resources for GDM improves access to best practice dietetic care *abs# 105*

Benjamin RS Dixon
Pregnancy outcomes among women with type 1 diabetes mellitus using continuous subcutaneous insulin infusion versus multiple daily injections; a retrospective cohort study *abs# 106*

Falahola Fuka
Gestational Diabetes Mellitus in Fiji - A single hospital based study of Prevalence and birth outcomes *abs# 108*

Alison Gebuehr
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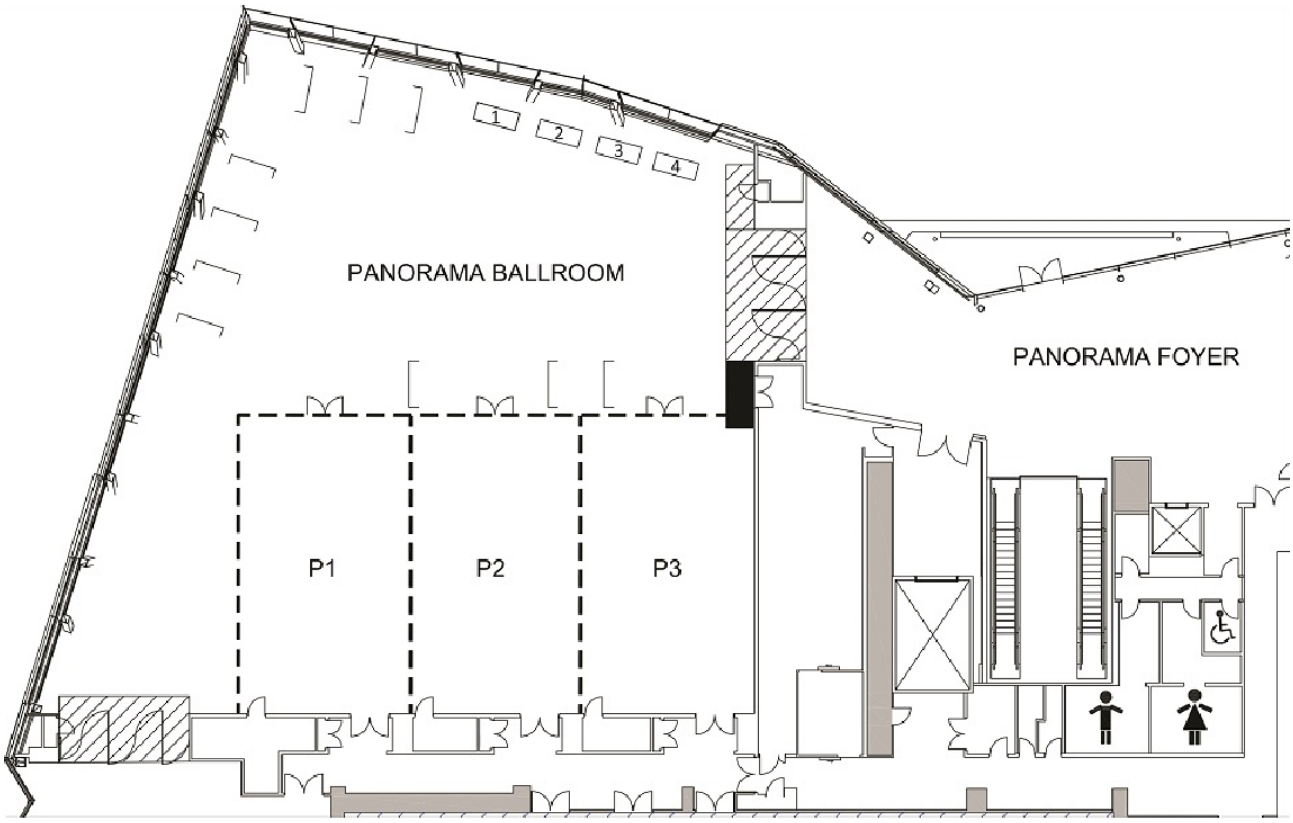

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ABSTRACTS

ORAL PRESENTATIONS

1

Fertility and preconception care in women with disorders of sugar metabolism

Mary Louise Hull[1]

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Good diabetic control prior to conception lowers the risk of fetal abnormality and complications of pregnancy, whereas diabetes in men is associated with poorer quality sperm and increased DNA damage. However, there is less certainty about the impact of glucose intolerance or hyperinsulinism on human fertility although both women and men with fertility problems have an increased risk of developing diabetes later in life. Women with polycystic ovarian disease have a particularly high risk, often demonstrating hyperinsulinism and higher rate of euploid miscarriage and gestational and type 2 diabetes. In animal models, exposure of embryos to high glucose environments resulted in delayed blastulation and reduced embryo viability, whereas endometrial effects included lower rates of viable implantation and reduced weight of the fetoplacental unit. The underlying mechanism for these fertility impacts was increased glycosylation of intracellular proteins and enzymes, leading to oxidative stress and DNA damage. Inflammatory cytokines and immune changes were also seen. Disorders of glucose metabolism are thus likely to impact negatively on fertility and miscarriage yet there is little clinical evidence to support this premise. Apart from recommendations to test for diabetes in the pre-published PCOS guidelines, there is poor consensus regarding screening for hyperinsulinism, glucose intolerance or diabetes in couples with infertility.We surveyed fertility specialists and found a significant variety of clinical practice in screening and treating couples for disorders of glucose metabolism. Barriers to effective screening include a lack of consensus on the appropriate test to do and when in treatment to undertake testing. Male testing was particularly controversial. Further research is needed to determine the role of aberrant insulin and glucose metabolism in infertility and miscarriageand how best to approach screening, testing and treatment to improve fertility outcomes.

2

Searching for utopia: defined dietary prescription and medical nutrition therapy for gestational diabetes management

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Dietary therapy is the cornerstone to the management of gestational diabetes mellitus. Medical Nutrition Therapy (MNT) is a therapeutic approach to deliver tailored dietary counselling to manage a disease or condition. The goals of MNT for GDM are to promote optimal foetal growth and maternal health by meeting nutritional needs in pregnancy and to promote normoglycemia, whilst avoiding ketonuria. Controversy remains over the most appropriate dietary prescription for the management of GDM. The aim of this presentation is to give an overview of the evidence in relation to aspects of medical nutrition therapy and defined dietary prescription for GDM including the amount and type of carbohydrate, nutritional adequacy, and gestational weight gain. Achieving a consistent, defined dietary prescription for women with GDM is unlikely to be achieved due to individual characteristics of glucose tolerance and glycaemic response, energy needs to promote healthy weight gain. An individualised approach is likely to achieve optimal pregnancy outcomes, however a renewed research focus on the process to engage women and deliver care is needed to ensure these positive health outcomes are realised.

3

Maternal hyperglycaemia in pregnancies: Effect of maternal management on the newborn and uncertainties surrounding best approaches to neonatal management

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Maternal hyperglycaemia in pregnancy represents the most common medical condition complicating both the antenatal and postnatal periods. Despite this there is still much controversy surrounding neonatal complications and postnatal management designed to avoid them. Even with advances in perinatal care, newborns of mothers with hyperglycaemia in pregnancy remain at risk for a multitude of physiologic, metabolic, and congenital complications. While postnatal hypoglycaemia occurs in up to 15 % of normal newborn babies in early postnatal life, the incidence in babies who have risk factors is much greater: up to 50 % in infants of diabetic mothers, large and small babies and 66 % in preterm babies. Care of these infants has focused on ensuring adequate cardiorespiratory adaptation at birth, possible birth injuries, and maintenance of normal glucose metabolism. Critically, neonatal hypoglycaemia is the only neonatal morbidity independently associated with later developmental delay in late preterm babies. While it is uncertain what degree or duration of hypoglycaemia is necessary before morbidity occurs, it is known that even babies without symptoms can have adverse outcomes. Here, the controversies which remain over the implications for the baby of differing approaches to maternal hyperglycaemia management will be discussed. In addition, the significant knowledge gaps in the data supporting current approaches to treatment of neonatal hypoglycaemia, despite repeated calls for the development of evidence-based treatment guidelines, will be highlighted.

4

Diabetes & Pregnancy: A Personal Perspective Formed Over a 50 Years Career

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Before diabetes mellitus could be treated with insulin, it was rarely seen during pregnancy and was associated with high maternal and fetal mortality. After insulin became available, in 1922, pregnant women with diabetes had better outcomes, but fetal and neonatal deaths remained common. In the mid 20th century, Jorgen Pedersen observed that glucose readily crossed the placenta. This lead to the critically important maternal hyperglycemia – fetal hyperinsulinemia – diabetes associated fetopathy (large fetal size, excess body fat and newborn hypoglycemia. Pedersen and others soon demonstrated that with the assistance of a team with medical, obstetric, nutritional and pediatric expertise employing liberal use of hospitalization outcome of pregnancy in women with diabetes could be greatly improved. However, at the time the diabetes and pregnancy center (DPC) was organized at Northwestern University nearly 50 years ago, we found it challenging to convince women with pre-existing diabetes that with meticulous effort and cooperation of patients and the healthcare team, favorable pregnancy outcome was achievable. Many had been advised to avoid pregnancies. Since that time, major technological changes have become available to assist in the achievement of more optimal metabolic control of diabetes in and outside of pregnancy. In 1989, the IDF/WHO Europe St. Vincent declaration set as goal, in all pregnancies complicated by diabetes, perinatal and long-term outcomes similar to women without diabetes. This has been a challenging goal. The number of pregnancies in all types of diabetes in pregnancy, T1DM, T2DM and GDM has increased. The parallel increase in rates of obesity in all ages of the population is an important contributor to this demographic. In 2015, Jovanovic, et al (Diabetes/Metabolism Research and Reviews, 31:707-16, 2015) used health claims from a database of 839,792 pregnancies to compare outcomes where diabetes status could be ascertained. Diabetes was present in 7.86%; T1DM 0.13%, T2DM 1.21% and GDM 6.29%). Those defined as GDM during pregnancy but with T2DM postpartum (progressing to T2DM) represented another 0.23%. Significantly higher rates of many pregnancy, neonatal and maternal outcomes were found in 1 or more of the groups listed above. Medical costs were also greater for mothers with compared to those without diabetes, especially for T1DM (nearly doubled). Thus, more than 25 years after the St. Vincent declaration, the goals for pregnancy outcome in mothers with diabetes have not be achieved.

Early in the 21st century new advances in insulin delivery and continuous glucose monitoring techniques offer new hope for an effective "artificial pancreas" and true optimal control of hyperglycemia.

5

Glucocentricity in pregnancy: ignoring other metabolic targets?

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2. Mater Research, Brisbane

Women with pregnancies complicated by diabetes mellitus or obesity continue to have poorer pregnancy outcomes for mother and infant. At present our clinical focus is on maternal glucose management, with dietary and pharmacological therapies. Other aspects of maternal metabolism including maternal lipids and ketones offer potential therapeutic targets. I will discuss research relating to the determinants of maternal non-glucose metabolism, and interaction with maternal microbiome.

6

Women with childhood trauma who develop depression prior to pregnancy are at increased risk of developing gestational diabetes

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5. Obstetric Medicine, Royal Brisbane and Women's Hospital, Brisbane, QLD, Australia

Aims: Growing evidence suggests that health and behavioural factors during early life and before conception may contribute to risk of developing gestational diabetes mellitus (GDM). Women's childhood psychosocial environment has been shown to influence diabetes risk in non-pregnant populations, but the impact on GDM risk remains unclear. This study sought to examine if the number and type of traumatic experiences in childhood are associated with future GDM risk.

Methods: The study included 6,317 women participating in the Australian Longitudinal Study on Women's Health who were followed from 1996 (age 18-23) until 2015. GDM diagnosis was reported for all pregnancies (N = 11,556). Exposure to eight adverse childhood experiences (ACEs), including abuse and household dysfunction, were recalled. Log-binomial regression models with generalised estimating equations were used to estimate relative risks (RR) and 95% CI. Analysis were adjusted for early life, preconception and antenatal GDM risk factors. Effect modification by preconception mental health was tested using cross-product terms.

Results: Women exposed to a higher number of ACEs were more likely to have lower education, and poorer lifestyle and physical and mental health prior to pregnancy. GDM occurred in 4.7% of pregnancies. Compared with no exposure to ACEs, exposure to any three or more ACEs (6% of women, RR 1.73 [95% CI 1.02, 3.01]) or four or more ACEs (7%, 1.76 [1.04, 2.99]) was associated with elevated GDM risk among women with preconception depressive symptoms, independent of early life, preconception and antenatal risk factors. Out of the eight adverse events examined, physical abuse and household substance abuse were associated with higher GDM risk. Exposure to ACEs did not influence GDM risk among women without depressive symptoms prior to pregnancy (P-value for interaction=0.01).

Conclusions: Our findings suggest that, in addition to primary prevention of childhood adversity, strategies to curb poor mental health trajectories into adulthood among women who grew up in stressful environments should be considered when developing programs for the prevention of GDM.

7

Health consequences for mother and baby of substantial pre-conception weight loss in women with obesity: Interim analysis of 'time to conception' data

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Background: Maternal obesity is known to adversely impact both time to conception and pregnancy outcomes. Some data suggests modest weight loss achieved with lifestyle modification reduces time to conception but does not alter pregnancy outcomes. Bariatric surgery alters pregnancy outcomes, but guidelines suggest delaying conception 18-24 months after surgery. We have compared 'time to conception' in obese women after a lifestyle modification (standard care) and after a VLED program.

Methods/design: A two-arm, parallel group, randomized control trial, was conducted at the University of Melbourne. Women (n=164) aged 18-38 years, with a BMI 30-55kg/m2, who planned to conceive in the next 6-12 months were randomized to one of two 12-week interventions. Group A aimed for modest weight loss (MWL ≤3% body weight) using a hypocaloric diet. Group B aimed for substantial weight loss (SWL 10-15% body weight) using a modified Very Low Energy Diet (VLED). Participants were observed for 12-months to determine if pregnancy occurred. Time to conception is calculated as the time from the end of the 12-week weight loss intervention to a derived date based on menstrual period and/or ultrasound dates.

Results: Of the 164 women enrolled in the study, n= 124 (76%) completed the weight loss phase of the study and were considered in the current analysis. Mean weight loss achieved was 3.1+/-3.9kg (3.1%) and 12.9+/-5.1kg (12.0%) in Groups A and B respectively. Of completers, n=71 achieved pregnancy (Group A n=30; Group B n=41); the observation period is ongoing in n=38 completers. Time to conception was 136.3 (+/- 94.7) days in Group A and 80.0 (+/-83.37) days in Group B (p=0.043). Miscarriage rate was n=7 (23%) and n=9 (21%) in Groups A and B respectively.

Conclusion: Substantial weight loss prior to conception decreases the time to conception in women with obesity when compared with modest weight loss.

Trial Registration: ANZCTR 12614001160628.

1. Callaway LK, Prins JB, Chang AM et al. The prevalence and impact of overweight and obesity in an Australian obstetric population. Med J Aust. 2006,16;184(2):56-9.
2. Ma RCW, Schmidt MI, Tam WH. Clinical management of pregnancy in the obese mother: before conception, during pregnancy, and post partum. Lancet Diabetes Endocrinol. 2016 Dec;4(12):1037-1049.

8

Impact of new criteria for the diagnosis of gestational diabetes *A maternal and neonatal health outcome and economic analysis in a large tertiary level maternity centre*

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Aim: To compare a cohort diagnosed with gestational diabetes under 1998 ADIPS criteria with 2014 ADIPS criteria, specifically to assess any improvements in outcomes, to attribute costs to the increased incidence and to assess any overall economic benefit.

Methods: Women diagnosed with gestational diabetes in 2014 and in 2016 were included as cases. Control groups in each year were those who did not have GDM (pre-existing diabetes and multiple pregnancy were exclusion criteria). Three analyses were undertaken. Firstly, all women in 2014 were compared to all women in 2016. Secondly, women with GDM were compared to controls in each year. Finally, women with GDM in 2014 were compared to women with GDM in 2016. Analyses included sub-division for diet-controlled and insulin-requiring GDM. Models of care for routine pregnancy, GDM diet-controlled and GDM-insulin controlled were costed using average-occasions-of-service for clinical reviews, pharmacy fees for medications and consumables, and Medicare Benefits Schedule item numbers for ultrasound services.

Results: There was an increase in annual incidence for GDM from 6.0% to 10.4% with costs of care increasing by over $900 000 (gross) and $560 000 (nett). There was a small hospital-wide reduction in very large babies (>95%) with no other significant differences. Women with GDM remain a higher risk cohort than those without GDM, but in 2016 women with GDM (diet-controlled) have similar outcomes to women without GDM.

Conclusions: The new criteria for diagnosing GDM has resulted in a marked increase in annual incidence (73% relative, 4.4% absolute) without a significant improvement in maternal and neonatal outcomes and with a concomitant increase in costs of care. The new criteria may lead to long-term improvements in health that are cost-effective but further research is required to substantiate this. Future randomized controlled trials into different systems of diagnosis and less expensive models of care are also warranted.

9

Implementation in the real world: OGTT failing to detect women at risk of GDM-related adverse birth outcomes

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Aims: Follow 600 pregnant women in regional and remote Western Australia to delivery, to assess effectiveness of the OGTT in detecting adverse GDM-related perinatal outcomes.

Methods: Forty-one primary healthcare clinics across the Kimberley, Mid-West, Goldfields, Southwest and Great Southern regions participated between 1st January 2015 to 1st February 2018. Women, aged 16-years or over, at first antenatal presentation, were invited to participate. Women with confirmed diagnosis of diabetes mellitus or multiple pregnancy were excluded. Routine maternal and birth data were collected and GROW

Customized Birth Weight Centiles calculated. OGTT [mmol/L] results were categorised based on the Hyperglycemia and Adverse Pregnancy Outcome (HAPO) Study (fasting: 2.5-4.1, 4.2-4.4, 4.5-4.7, 4.8-4.9, 5.0-5.2, 5.3-5.5, 5.6-5.8; 1-hour: 2.5-5.8, 5.9-7.3, 7.4-8.6, 8.7-9.5, 9.6-10.7, 10.8-11.7, ≥11.8; 2-hour: 2.5-5.0, 5.1-6.0, 6.1-6.9, 7.0-7.7, 7.8-8.7, 8.8-9.8, 9.9-11.1). GDM diagnosis was based on IADPSG criteria. Two study General Practitioner Obstetricians, blinded to routine investigations, independently determined if adverse perinatal outcomes were likely GDM-related.

Results: Of 694 recruited participants, 604 (66% with one or more high-risk factor) continued participation (39% Aboriginal) and delivered after 24 weeks gestation. Only 61% adhered to 2014 ADIPS screening recommendations. Sixty-seven (11%) met the criteria for GDM. Women screened at 24-32 weeks were significantly more likely to be in a lower glucose category compared with the HAPO cohort (fasting: OR 3.4; 95% CI 2.8-4.0, p<0.0005; 1-hour: OR 1.7, 95% CI 1.4-2.0, p <0.0005; 2-hour: OR 1.4, 95% CI 1.2-1.7, p <0.0005). Glucose instability in our cohort was a likely consequence of delays in laboratory testing (median time-to-analysis: 4.4 hours vs HAPO <1 hour). Preliminary analysis suggest 79% of mothers of infants with composite outcome of birth weight >90th centile and/or neonatal hypoglycaemia, had a normal OGTT or were not tested.

Conclusions: In this high-risk for GDM population, the OGTT was poorly accepted and not implemented according to strict pre-analytical guidelines. Consequently, this one-step screening and diagnostic tool fails to identify women who would likely benefit from intervention.

10

Is diagnosis and treatment of gestational diabetes earlier than 20 weeks associated with adverse outcomes?

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Aims: Recent ADIPS guidelines note that high-risk pregnant women are more likely to have gestational diabetes mellitus (GDM) and therefore, are recommended to be screened earlier (<20 weeks). Women diagnosed with early GDM are at increased risk of adverse outcomes (Immanuel & Simmons, 2017) and are treated once diagnosed including glucose and weight management. This study compared the clinical characteristics, and pregnancy outcomes of women with GDM diagnosed at <20 weeks gestation and those at ≥20 weeks gestation, in a large treated multiethnic cohort.

Methods: Data were from a retrospective combined clinical review of GDM women diagnosed by ADIPS 1998 criteria and managed at Liverpool and Bankstown-Lidcombe hospitals from 2010-2016. Women with fasting plasma glucose ≥7.0 mmol/L and/or 2hr plasma glucose ≥11.1 mmol/L, during pregnancy, were excluded. Characteristics were compared using Chi-squared and ANOVA. Odd Ratios (ORs) and 95% confidence intervals (95%CI) were assessed using multivariable logistic regression.

Results: Women diagnosed earlier (n=1,216) were more likely to have high-risk characteristics: (older, higher body mass index, greater proportion with previous GDM and family history of diabetes, and higher HbA1c at diagnosis) than those diagnosed later during pregnancy (n=2,649), (P<0.05). However, fasting and 2hr glucose concentrations were similar. Women with early GDM were most likely to require insulin during pregnancy (OR 1.90; 95%CI: 1.58, 2.29). Women diagnosed earlier also had a higher risk of congenital malformations (OR 1.45; 95%CI: 1.01, 2.08); preterm delivery (OR 1.61; 95%CI: 1.26, 2.08) and neonatal hypoglycaemia (OR 1.60; 95%CI: 1.34, 1.91). The risk of caesarean section was lower in those diagnosed early (OR 0.50; 95%CI: 0.43, 0.58). The risk of small- and large- for gestational age was not statistically different between the two study groups (P>0.05).

Conclusion: Poorer pregnancy outcomes were found among women with early diagnosis of GDM in spite of standard glycaemic management. Additional interventions beyond existing management may be required for women with early GDM.

11

Managing Gestational Diabetes Mellitus with the M♡THer App and Interactive Internet based Clinician Portal (Internet-Based)

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Background Implementation of the Australian Diabetes in Pregnancy (ADIP-2014) guidelines increased the number of women diagnosed with Gestational Diabetes Mellitus (GDM) at Redland Hospital.

Women use paper diaries to record blood glucose levels (BGL's) that is inconvenient, time consuming and ineffective, rendering sharing of health care for these women suboptimal and resource intensive. To improve care, a digital platform called M♡THer, consisting of a smartphone app to support women with GDM and an Internet-based interactive system for their treating clinicians was developed by CSIRO in collaboration with Redland Hospital. The project was funded by Metro South Health (MSH), Information and Communication Technology (ICT) and the Executive Planning and Innovation Committee (EPIC).

Aim A pilot study was conducted to investigate the effectiveness, convenience and user-friendliness of the M♡THer platform.

Methods Pilot study 40 women diagnosed with GDM between 24-28 weeks gestation (nil previous GDM) were recruited. The smartphone App uploaded the readings to the portal when the women manually or by Bluetooth entered their BGL's to their meter. Clinicians reviewed the BGL's results at any time via the portal. Incorporated into the App are: personal goals, exercise, diet and educational multimedia content links. Post-delivery a user experience survey was sent to all participants (women and staff involved in their care).

Results 40 women participated, 8 women were identified with elevated readings in the first week of using the app enabling early intervention. Due to elevated fasting BGL's, 12 were commenced on Metformin, 8 were commenced on insulin.

A survey response from the women showed the app is user friendly, convenient, and continuation is highly recommended. Treating clinicians reported improved communication with the women they treat and showed an increase in multi-disciplinary co-ordination amongst themselves.

Conclusion The pilot study has confirmed that this technology works for women with GDM. Use of the M♡THer platform improved Holistic care, accurate reporting of BGLs, client satisfaction and increased communication between multi-disciplinary team staff.

1. Australian Diabetes in Pregnancy Guidelines: https://adips.org/downloads/2014ADIPSGDMGuidelinesV18.11.2014_000.pdf

12

Exercise improves glycaemic control in women diagnosed with gestational diabetes mellitus: a systematic review

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Aim: To investigate if exercise improves postprandial glycaemic control in women diagnosed with gestational diabetes mellitus.

Design: A systematic review with meta-analysis of randomised, controlled trials.

Method: Participants were pregnant women diagnosed with gestational diabetes mellitus where the intervention was exercise, performed more than once a week, sufficient to achieve an aerobic effect or changes in muscle metabolism. Outcome measures included postprandial blood glucose, fasting blood glucose, glycated haemoglobin, requirement for insulin, adverse events and adherence.

Results: Eight randomised, controlled trials (588 participants) were included; seven of these trials (544 participants) had data that were suitable for meta-analysis. Five trials scored ≥ 6 on the PEDro scale, indicating a relatively low risk of bias. Meta-analysis showed that exercise, as an adjunct to usual care, significantly improved postprandial glycaemic control (MD –0.33 mmol/L, 95% CI –0.49 to –0.17) and lowered fasting blood glucose (MD –0.31 mmol/L, 95% CI –0.56 to –0.05) when compared with standard care alone, with no increase in adverse events. Effects of similar magnitude were found for aerobic and resistance exercise programs, if performed at a moderate intensity or greater, for 20 to 30 minutes, three to four times per week. All studies reported that complications or other adverse events were either similar or reduced with exercise.

Conclusion: Adding exercise to usual care of gestational diabetes mellitus, safely helps to control postprandial blood glucose levels and other measures of glycaemic control and may assist in reducing maternal and neonatal complications in gestational diabetes mellitus.

13

Individualised multidisciplinary management of gestational diabetes with protocolised frequent follow-up results in fewer neonatal special care nursery admission in private practice.

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Background: Gestational diabetes (GDM) affects approximately 10% of the Australian population. Management of GDM through public hospitals alone is not practical due to limited resources. There is a paucity of data of private models of GDM care.

Aims: This is the first report of results of an evidence-based program in a private GDM clinic in Australia.

Methods: Retrospective review of de-identified data for all women with GDM, and their babies, admitted for confinement to a Sydney private hospital from Feb 2015 to Aug 2016. We compared women who underwent treatment with Sydney Endocrinology (SE) to those whose GDM was managed privately or publically elsewhere. The SE multidisciplinary GDM clinic was founded with funding from a Friends of the Mater grant.

Results: Of 3800 births 390 babies were born to mothers with a history of GDM. Of these, 177 were managed through SE. The SE protocol includes an initial one-on-one multidisciplinary review with an endocrinologist, dietitian and diabetes educator, then weekly email contact, and further visits as required. Where possible, there is direct liaison with the patients obstetrician and midwife.

SE patients did not differ from non-SE patients in age (34.9 vs 34.6 years), BMI (24.0 vs 24.1 kg/m^2), or ethnicity (all p=NS). There was no increase in the odds of elective or emergency Caesarian section (p=0.49, chi squared test for trend, Newcombe-Wilson method). SE patients had in increased odds of insulin and/or metformin prescription (49% vs 35%, respectively, OR 1.8, 95% CI 1.2-2.7, p=0.005).

The SE babies did not differ from non-SE babies in gestational age at birth (mean 38.3 vs 38.2 weeks, respectively), weight (3177 +/- 519g vs 3238+/- 477g, respectively), length (mean 50.6 vs 50.8 cm, respectively) or head circumference (all p=NS). There was a lower rate of special care nursery (SCN) admission for SE vs non-SE patients (23% vs 32%, respectively, OR 0.62, 95% CI 0.40-0.97, p=0.04). Similarly there were lower rates of hypoglycaemia (defined as <=2.5mmol/L, 36% vs 48%, respectively, OR 0.61, 95%CI 0.41-0.92, p=0.02). There was no difference in the mean lowest glucose of those that suffered hypoglycaemia in each group (2.0 vs 2.0 mmol/L, p=NS), rates of jaundice (32% vs 29%, p=0.7), nor foetal anormality (7.3% vs 7.0%, p=0.8).

Discussion: In the private health care setting, GDM patients managed through a individualised multidisciplinary system with protocolised frequent follow-up are less likely to require SCN admission. This is likely related to more frequent initiation of insulin therapy, and is not associated with increased rates of neonatal hypoglycaemia, jaundice or malformation. We also postulate this is related to close frequent follow-up of patients, and extensive dietetic coaching and input. Further studies in this area would be useful to confirm these findings.

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Predictors of Pharmacotherapy Choice in Women with Gestational Diabetes

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Background/aims: Metformin is a potential alternative to insulin therapy for Gestational Diabetes Mellitus (GDM), however controversy still exists regarding its optimal use and relative therapeutic benefit. The aim of this study was to determine maternal characteristics associated with pharmacotherapy choice and relationships with maternal and fetal outcomes.

Methods: This retrospective, cohort study included women with GDM attending Royal North Shore Hospital from 2010 to 2017. Maternal characteristics, pharmacotherapy, and maternal and fetal outcomes were extracted from electronic medical records. Univariate and multivariate analyses were undertaken using SPSS v24.

Results: Of 540 women with GDM (age 33.8 ± 4.5 years, BMI 25.3 ± 5.8kg/m^2, parity 1.7 ± 0.8, gestational age at GDM diagnosis 25.5 ± 5.8 weeks), 269 (49.8%) were managed with diet and lifestyle modification alone, 166 (30.7%) with insulin, 64 (11.9 %) with metformin and 41 (7.6%) with combination metformin and insulin.

Women managed with diet/lifestyle had lower BMI compared to other groups ($p < 0.005$). Higher BMI was predictive of metformin use in the diet group ($p < 0.05$), and supplemental therapy in the metformin group ($p < 0.05$). Earlier diagnosis of GDM was predictive of metformin therapy ($p < 0.005$). Women diagnosed later in pregnancy were less likely to require pharmacotherapy ($p < 0.05$). Higher fasting blood glucose at diagnosis was indicative of need for pharmacotherapy ($p < 0.05$). Women requiring combination metformin and insulin were older ($p < 0.01$), with higher BMI, and greater parity (both $p < 0.05$). There was no difference in adverse maternal or fetal outcomes between groups.

Conclusion: Our data indicate that early-pregnancy BMI, gestational age at GDM diagnosis, and fasting blood glucose level on OGTT are significant predictors of the requirement for pharmacotherapy. Maternal and fetal outcomes were similar regardless of therapeutic choice, suggesting that treating to target glucose levels confers maternal and fetal benefit irrespective of the agent chosen.

15

HAPO AND HAPO FUS: Implications for the Diagnosis of Gestational Diabetes

Boyd Metzger

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Before the Hyperglycemia and Adverse Pregnancy Outcome (HAPO) Study was carried out, it was controversial whether maternal hyperglycemia less severe than that in diabetes mellitus is independently associated with increased risks of adverse pregnancy outcome. The HAPO Study found continuous associations of maternal glucose levels less than those diagnostic of diabetes with 4 primary outcomes (birth weight >90th percentile, primary Cesarean delivery, cord-blood serum C-peptide >90th percentile, clinically identified neonatal hypoglycemia). Associations with several secondary endpoints that included neonatal adiposity, preterm delivery, shoulder dystocia or birth injury and preeclampsia were also found. There were no obvious thresholds at which risks increased. These and other study results lead the International Association of Diabetes and Pregnancy Study Groups (IADPSG) to propose "outcome-based" criteria for the diagnosis of gestational diabetes mellitus (GDM). Questions about the application of these criteria in routine clinical care will be discussed elsewhere in this conference.

This presentation will focus on the HAPO Follow Up Study (HAPO FUS) that included examinations of mother-child pairs 10-14 years after participation in the original HAPO Study. The primary goal of the child component of HAPO FUS was to examine associations of maternal glycemia and GDM with childhood adiposity in a cohort treatment where treatment of maternal hyperglycemia was not a confounding factor. A second goal was to examine associations of maternal glycemia and GDM with childhood disorders of glucose metabolism (impaired glucose tolerance [IGT], & T2DM). HAPO FUS found highly significant associations of GDM with multiple measures of child adiposity at 10-14 years of age, i.e., BMI thresholds for obesity, % body fat, sum of skinfolds and waist circumference. However, the association of GDM with the BMI threshold for overweight/obesity combined was of borderline significance, confirming the common observation that not all children with a high BMI are obese. HAPO FUS also found highly significant associations of GDM with IGT/T2DM, but not with impaired fasting glucose. Offspring of HAPO FUS mothers retrospectively classified as GDM by IADPSG criteria were also more insulin resistant with a lower Disposition Index that those whose mothers did not have GDM.

In conclusion, the HAPO & HAPO FUS studies indicate that GDM by IAPDPSG criteria is associated with adverse perinatal and long-term outcomes that can contribute to the cycle of increasing obesity and metabolic disorders globally.

16

Introduction – Current Australian criteria / NZ criteria. Time for review?

David McIntyre

1. Head of Mater Clinical Unit, University of Queensland, South Brisbane, Australia

Since their initial publication in 2010, the IADPSG recommendations for detection and classification of hyperglycemia in pregnancy have drawn divergent responses from women, clinicians and policy makers around the world. Despite endorsement from WHO (2013) and FIGO (2015), international consensus remains elusive and concerns about "overdiagnosis" persist. ADIPS was involved in the international consensus process leading to these recommendations from the earliest stages and strongly participated in the national consensus process, led by RANZCOG, which led to predominant adoption of the "one step" IADPSG process across Australia. This approach has been endorsed in current (2018) NHMRC guidelines for antenatal care.

Nonetheless, concerns regarding the high prevalence of GDM, especially in areas with a large proportion of women in the childbearing years from high risk ethnic groups, have so far prevented uniform adoption of IADPSG / WHO2013 diagnostic criteria for GDM across Australia. Concerns include the potentially unmanageable workload posed by increasing numbers of GDM patients, doubts about "value" or risk / benefit and cost / benefit aspects of treatment and concerns from women that a GDM diagnosis may preclude them from continuing in their preferred model of care.

Further, some important stakeholder organizations including the RACGP have declined to endorse the current guidelines. Proposals have been floated for a new consensus development process involving a broader spectrum of consumer and professional interest groups. This symposium aims to present a range of views on the current status of GDM diagnosis, drawing on local and international experience from the endocrine, obstetric, midwifery and diabetes education perspectives.

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Some International perspectives regarding changing the criteria for GDM

David Simmons[1]

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The IADPSG/WHO criteria were intended to move a plethora of diagnostic approaches to gestational diabetes (GDM) to a common pregnancy outcome based set of diagnostic criteria. However, the adoption of these epidemiologically based criteria increases workload (costs) for the diabetes/antenatal services, with a reduction in birth and possibly longer term complications. While many countries have moved to the new criteria (including Australia), others have either remained unchanged (eg New Zealand), moved to other criteria based upon the Hyperglycaemia And Pregnancy Outcomes (HAPO) risk thresholds (eg Canada, India) or manufactured other criteria (eg the UK). There have now been several studies describing how the shift (with no other service changes) from old to the new criteria (Spain, Taiwan) were associated with a reduction in adverse pregnancy outcomes. Other studies have shown that those untreated yet fulfilling IADPSG/WHO criteria have poor outcomes with both untreated fasting (eg UK odds ratio (95%CI) 5.1-5.5 mmol/l vs background: LGA-4.47(3.15-6.33), emergency caesarean section 1.66 (1.13-2.43), polyhydramnios (4.67 (1.83-11.89)) and untreated 1 hour (eg UK odds ratio (95%CI) ≥10.0 mmol/l vs background: LGA-2.58 (1.93-3.46), emergency caesarean section 1.49 (1.10-2.21), polyhydramnios (7.46 (4.06-13.72)) post glucose load results. In Canada, where the criteria are at a higher HAPO threshold (odds ratio 2.0), the risk of adverse neonatal outcomes in those with untreated GDM by IADPSG/WHO criteria are 1.4(1.1-1.9) fold that of the background population. Sweden has elected to address the uncertainty behind the costs and benefits of introducing the new IADPSG/WHO criteria, by rolling them out through a nationwide step wedge cluster randomised controlled trial (the CDC4G trial). The new criteria clearly target a group of women at substantially increased risk of adverse pregnancy outcomes. International experience can inform the Australian/New Zealand debate on which criteria will yield the best balance of costs and benefits.

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Midwife / Diabetes Educator perspective. View from the trenches… How are we managing workload issues?

Janet Lagstrom[1]

1. Diabetes Nurse Practitioner, Yarrawonga, VIC, Australia

The Australian Diabetes Pregnancy Society (ADIPS), first updated the Gestational Diabetes (GDM) guidelines in 1999, over time, implemented around Australia. Ready for change, ADIPS adopted the consensus guidelines by the International Association of Diabetes and Pregnancy Study Groups (IADPSG, 2010), in 2014. These developed from the growing evidence base for adverse outcomes in pregnancy enhanced by the Hyperglycemia and Adverse Pregnancy Outcome Study (HAPO, 2008).

Four years later, Australia and New Zealand continue to lack uniformity in management of GDM women, stemming from the Royal College of General Practice (2016- 2018) statement "at present, little evidence that clinical intervention is beneficial for the additional women identified by the new screening criteria", as such has been (mis)interpreted around rural and tertiary Institutions.

Change included:

- Omission of 1-hour 50g Glucose Challenge Test (GCT): one step diagnosis (less anxiety, however longer test for pregnant women).
- Lowered FBG diagnostic target (from less than 5.5 to 5.0 mmol/L) (increased women diagnosed and, workload for staff)
- Additional diagnostic target, 1 hour post 75g load *to reduce Caesarean births* (should we advise checking 1hour or 2 hour pp for these women)
- Provision of 2 options whether to commence medication, suggesting Clinicians make own decision rather than use a National Consensus, lending women to receive conflicting advice from GP, CDE, and Birth Venue
  (Will women change Birth Venue to avoid insulin initiation)

On behalf of the women we care, I seek consensus:

- We should develop and use clear terminology
- We should liaise with our respective Clinical partners (RACGP / RANZCOG/ AAPP)
- We should develop and use consistent criteria, regardless of site
- We should be aware of current guidelines

Please share your opinion!

1. ADIPS (2014), ADIPS consensus guidelines for the testing and diagnosis of gestational diabetes mellitus in Australia. [Online]. Retrieved from: https://adips.org/information-for-health-care-providers-approved.asp
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4. RACGP (2016). RACGP Clinical Guidelines. General practice management of type 2 diabetes. [Online]. Retrieved from: https://www.racgp.org.au/your-practice/guidelines/diabetes/13-diabetes-and-reproductive-health/133-gestational-diabetes-mellitus

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Obstetrician perspective.

Ian Fulcher[1]

1. Liverpool Hospital and Bathurst Base Hospital, Liverpool, NSW, Australia

The juxtaposition of the new IADPSG diagnostic criteria, increasing maternal obesity, advancing age at conception and background ethnic predisposition to diabetes has led to a significant increase in women being diagnosed with gestational diabetes.

The HAPO Study published in 2008 has provided us with the largest database on fetal outcomes in pregnancies complicated by hyperglycaemia of varying degrees of severity. On the basis of this the IADPSG recommended the formulation of new consensus guidelines for the diagnosis of GDM.

These recommendations were endorsed by WHO and ADIPS as well as ADS but not by SOMANZ or ESA. In November 2013 RANZCOG convened a multidisciplinary working party to discuss the proposed pathway and criteria for diagnosis of GDM. Although invited, representation from ESA and RACGP was declined. This meeting recommended:

1. A single step OGTT at 24-28 weeks' gestation
2. Adoption of WHO-2013 diagnostic criteria by 1 Jan 2015.

The increased workload has led some Obstetricians to question the validity of the GTT cut-offs determined by a RR of 1.75 based on the HAPO data. The concerns expressed include:

1. Crowded clinics may result in higher risk patients being overwhelmed by lower risk patients.
2. Doctor fatigue may result in warning signs of adverse outcome being missed.
3. Being labelled "lower risk" may alter perception of risk and alter compliance accordingly.
4. Input and advice in the step-down clinic may vary from the high -risk clinic.

Discussion points:

1. Have the new guidelines led to significant improvement in fetal outcomes?
2. Should we maintain Australian guidelines rather than adhere to international guidelines to improve our flexibility to respond to local issues?
3. Should we define a high-risk algorithm including obesity and advancing maternal age and ethnicity to select those at greater risk to optimise provision of appropriate levels of care?

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Diabetic nephropathy and pregnancy

Shilpa Jesudason

Diabetes is the leading cause of kidney disease and kidney failure in Australia. We are increasingly observing diabetic kidney disease in patients of a younger age.

Kidney disease of all stages can have an impact on pregnancy outcome. In this session the significance of any disease in pregnancy will be discussed, with a focus on diabetic nephropathy and the particular challenges this poses. There will be a discussion of the impact of early stage kidney disease on pregnancy, and tips for management to optimise outcomes.

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Cardiomyopathy and pregnancy

Joanne Judd[1]

1. Cardiologist, Adelaide, Adelaide, SA, Australia

Heart disease is the most common cause of morbidity and mortality in women in pregnancy. There is a risk of cardiomyopathies in pregnant women, and this is further increased in diabetic women.

This talk will discuss some of the common causes of maternal death in Australia. It will include a brief discussion of the circulatory changes in pregnancy and birthing, and which cardiac conditions are considered high risk in pregnancy. The use of medications to treat heart failure in pregnancy will be reviewed. Three different types of cardiomyopathy in pregnancy will be discussed including Peri-partum, Dilated and Hypertrophic Cardiomyopathy and will be illustrated by clinical cases.

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Retinopathy and pregnancy

Jamie Craig[1]

1. Flinders University, Adelaide, SA, Australia

Content not provided in time of print

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Should we recommend insulin pumps and CGM in pregnancy?

Sue Mei Lau[1]

1. Prince of Wales Hospital, Randwick, NSW, Australia

Insulin pumps and CGMS are being increasingly used to manage type 1 diabetes in pregnancy, but are they worth the time and resources? This presentation will look at the evidence for insulin pumps and CGMS in pregnancy and discuss factors influencing the decision to use these forms of technology in pregnancy. Examples will be presented of patients who may (or may not) have benefited from pumps in pregnancy.

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Practical tips on managing women on insulin pumps and CGM

Winnifred Lee[1]

1. Mater Hospital, Spring Hill, QLD, Australia

The benefits of Insulin pump use in pregnancy have been difficult to define in clinical trials and are not "a script to be dispensed for all". This is due to several issues including 1) HbA1c changes are not adequate to assess benefits 2) insulin pumps are used often later in the disease, with complications or when there is loss of hypoglycaemia awareness 3) benefits of the insulin pump are operator- dependent and require anticipatory adjustments 4) appropriate comprehensive management requires a team of experienced diabetes educator, dietitian and endocrinologist to support the patient with the significant changes in insulin requirements in pregnancy. This presentation will show how " time in range " glucose monitoring and knowledge of anticipatory insulin pump adjustments may improve pregnancy outcomes. Cases will be presented highlighting how insulin pump therapy may be helpful in managing diabetes in pregnancy, including a guide to insulin pump rate adjustments through pregnancy, management of those with severe insulin resistance and peripartum management involving steroids.

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Nuts and bolts of pumps and CGM

Rebecca Humphreys

1. Australian Diabetes Educators Association, ACT, Australia

With the use of insulin pump therapy and continuous glucose monitoring on the rise, this session will cover the practical aspects of these devices in pregnancy, including planning for delivery, infusion set placement and what to look at in the data reports. Rebecca will also explain the current devices that are available in Australia and what the cost is to patients. This session will also include some case examples and experiences from her practice with using CGM in pregnancy.

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Heterogeneity in insulin sensitivity and insulin secretion in gestational diabetes mellitus relates to differences in pregnancy outcomes

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2. Mater Research, University of Queensland, South Brisbane, Queensland, Australia

3. Mater Research and School of Medicine, University of Queensland, South Brisbane, QLD, Australia

Varying clinical phenotypes exist within the overarching "diagnosis" of Gestational Diabetes Mellitus (GDM), encompassing women with predominant defects in insulin sensitivity, insulin secretion or a combination of both. We aimed to determine if GDM phenotypes were independently associated with birthweight, LGA (large for gestational age), preterm delivery, caesarean delivery (CS), and a composite of GDM-related adverse pregnancy outcomes (LGA, neonatal hypoglycemia, or caesarean delivery), when adjusted for potential confounders.

Using data from OGTTs at mean gestational week 28 in the Brisbane HAPO study cohort, we estimated insulin sensitivity (Matsuda index) and secretion (HOMA β) in 1245 women. In women with GDM (10.5%, when using IADPSG criteria), defects in insulin sensitivity and/or insulin secretion were defined as <25th percentile in non-GDM women. This approach yielded four subgroups named by the predominant defect; low insulin sensitivity (GDMsens), low insulin secretion (GDMsec), both defects (GDMmixed), or no detectable defects (ND). We created linear and logistic regression models adjusted for maternal age, maternal height, BMI, smoking, gravidity, parity, family history of diabetes, mean arterial BP, and HbA_{1c}. No women received GDM treatment during pregnancy.

Relative to non-GDM women, women in the GDMsens group (52.7% of all GDM) had higher BMI (33.8 vs 28.6 kg/m^2, p<0.001), higher mean arterial BP (87 [SD 7] vs 83 [SD 7] mmHg, p<0.001), gave birth to heavier infants (birth weight z scores 0.67 [SD 1.12] vs 0.19 [SD 0.98], p<0.001) with a higher odds of LGA (OR 2.34; 95% CI 1.33, 4.12; p=0.003); had higher odds of preterm delivery (OR 2.62; 95% CI 1.14, 6.04; p=0.024), and higher odds of delivering by CS (OR 1.89; 95% CI 1.15;3.10, p=0.012). Relative to non-GDM women, women with GDMsec defects (17.6%) were older (33.6 [SD 4.5] vs 29.2 [SD 5.2] years, p<0.001), but pregnancy outcomes were similar. Relative to non-GDM women, women in the GDMmixed (14.5%) group had higher BMI (32.8 [SD 6.5] vs 28.6 [SD 5.5] kg/m^2, p=0.003) and showed similar trends in outcomes to the GDMsens group, though none achieved significance. The ND women (15.3%) did not differ from non-GDM women. When adjusting for confounders including BMI, only the GDMsens group were still at increased odds for preterm delivery (OR 2.56; 95% CI 1.02, 6.46; p=0.046).After adjusting for BMI, the odds of CS and LGA babies were no longer higher in the GDMsens group. We found no increased risk of the composite GDM-related adverse pregnancy outcome in any subgroup.

Different clinical phenotypes in GDM are associated with differing risks of LGA infants, preterm delivery, and caesarean delivery. Women with GDM, predominantly due to a defect in insulin sensitivity have higher risks of adverse outcomes; only partly explained by BMI and other confounders.

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Comparison of the Oral Glucose Tolerance Test and HbA1C as a diagnostic screening tool for Gestational Diabetes

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Introduction Gestational diabetes (GDM) has a strong association with adverse pregnancy outcomes therefore screening is recommended in all pregnant women.

Although it is regarded as the diagnostic tool of choice, the OGTT has a number of drawbacks and therefore the ADIPS consensus guidelines has suggested the HbA1c as an alternative screening tool for GDM.

The aim of this prospective study is to evaluate the performance of HbA1c to detect GDM in comparison to the OGTT and to assess the association between HbA1c and the risk of adverse pregnancy outcomes.

Method 100 women that attended one of three outpatient antenatal clinics were recruited.The blood samples for the OGTT and the HbA1c were collected concomitantly.

The WHO criteria was used to then compare various levels of HbA1c against, to thus determine sensitivity.

Results

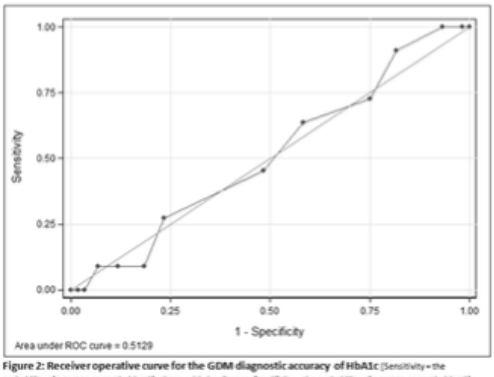

Figure 2: Receiver operative curve for the GDM diagnostic accuracy of HbA1c (Sensitivity = the probability of a test to correctly identify those with the disease; Specificity = the probability of a test to correctly identify those without the disease)

The HbA1c did not perform well in distinguishing GDM cases from no-GDM based on the OGTT (AUC 0.513, 95% CI 0.333 – 0.693).

In regards to the association between HbA1c and adverse fetal outcomes, our study estimate suggests that a unit increase in HbA1c was associated with a 1.79 time increase in odds of resuscitation and higher HbA1c results were associated with smaller birth weight.

Discussion Further research is required, especially correlating lower levels of HbA1c to GDM. The HbA1c in its current form should not be used to screen GDM as it can falsely reassure clinicians due to low sensitivity.

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The influence of maternal age, booking body mass index, and ethnicity on the prevalence of booking gestational diabetes mellitus. Preliminary findings from a multicenter randomized controlled trial

Jincy Immanuel[1], David Simmons[1], Lisa Vizza[1], Bill Hague[2], Helena Teede[3], N Wah Cheung[4], Emily Hibbert[5], Christopher Nolan[6], Michael Peek[7], Vincent Wong[8], Jeff Black[9], Mark Mclean[10], Alexandra Kautzky-Willer[11], on behalf of the[12]

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8. Liverpool Hospital, Sydney, NSW, Australia

9. Bankstown-Lidcombe Hospital, Sydney, NSW, Australia

10. Blacktown Hospital, Sydney, NSW, Australia

11. Gender Medicine Unit, Division of Endocrinology and Metabolism, Department of Medicine III, Medical University of Vienna, Vienna, Austria

12. TOBOGM, consortium

Aim: This study assessed the prevalence of Gestational Diabetes Mellitus (GDM) at booking and its association with age, body mass index (BMI), and ethnicity among at-risk women enrolled in the Treatment of Booking Gestational Diabetes Mellitus (TOBOGM) study.

Methods: Pregnant women with risk factors for hyperglycemia in pregnancy were enrolled at booking (<20 weeks gestation) between June 2017 and May 2018. "GDM" and diabetes in pregnancy (DIP) were diagnosed using the criteria for GDM at 24-28 weeks gestation in the ADIPS 2014 guidelines. "GDM" women were further stratified into low band (fasting 5.1–5.2mmol/L, 1 hour 10.0–10.5mmol/L, 2 hours 8.5–8.9mmol/L), high band (fasting 5.3–6.0mmol/L, 1 hour ≥10.6mmol/L, 2 hours 9.0–11.0mmol/L), and high fasting glucose (HFG) (fasting 6.1-6.9mmol/l) groups based on the IADPSG odds ratios (ORs) of 1.75 and 2.0 for pregnancy complications of GDM diagnosed at 24-28 weeks gestation.

Results: In 638 pregnant women tested, the prevalence of "GDM" at booking was 24.1%. Among those diagnosed with "GDM", 40.3% were in the low band and 59.7% were in the high band. The prevalence of DIP was 0.6%, with a further 0.6% with HFG. Compared with 'normal' women, women with "GDM" were older (p<0.001), heavier (p<0.001) and of non-European descent (p=0.037). GDM low- and high-band groups were similar except for their mean maternal age (30.6 ± 4.9 vs. 32.5 ± 4.1 years, p=0.011). The ORs for "GDM" development were higher in women older than 35 years (OR 3.97 [1.91–8.24]), BMI ≥35kg/m^2 (OR 2.42 [1.46–4.02]) and of non-European descent (OR 1.60 [1.10–2.34]) compared with the young, normal weight, European descent reference group.

Conclusion: Preliminary results indicate that the prevalence of booking "GDM" is high among women at increased risk. The association between traditional risk factors and early "GDM" is high in the TOBOGM cohort.

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Prophylactic aspirin and fetal growth in diabetic pregnancies

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Background Current guidelines including those of the World Health Organization recommend low dose aspirin for all pregnant women with pregestational diabetes mellitus to reduce the risk of preeclampsia and small for gestational –age babies. A recent secondary meta-analysis of the maternal-fetal-medicine units' high risk aspirin trial [1] found significantly higher rates of large for gestational age births in women with pregestational diabetes without microvascular complications, who had received aspirin prophylaxis compared to those randomised to placebo [2]. In addition, aspirin prophylaxis was not found to reduce the number of small for gestational age neonates.

Aim To determine whether low dose aspirin use in pregnancy is associated with an increased risk of large for gestational age infants in women with complicated and uncomplicated pregestational diabetes.

Method A retrospective study of 850 singleton pregnancies in women with pregestational diabetes (type 1 or type 2) delivering at King Edward Memorial Hospital between January 2013 to December 2017. Data was acquired from the midwives STORK database for demographics, ethnicity, parity, BMI, smoking history, pre-existing hypertension and birth weight. Individual patient notes were reviewed to determine duration of diabetes and associated complications, family history of hypertension, aspirin prophylaxis, HbA1c, pregnancy complications, celestone administration and birth complications. Birth centiles were calculated using the GROW calculator.

Statistical analysis will be performed to determine any association between aspirin prophylaxis and small or large for gestational age babies and incidence of preeclampsia in women with complicated and uncomplicated diabetes. This will include multivariate regression to account for potential confounders of birth centile including maternal BMI and level of maternal diabetic control.

Results Data and conclusions will be presented

1. 1. Caritis S Low-dose aspirin to prevent preeclampsia in women at high risk. National Institute of Child Health and Human Development Network of Maternal Fetal Medicine Units. NEJM 1998; Mar 12; 338 (11): 701-5.
2. 2. Adkins K et al. Impact of Aspirin on fetal growth in diabetic pregnancies according to White classification. Am J Obstet Gynecol 2017; Oct; 217 (4):465e1

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Should women with diabetes in pregnancy (DIP) undergoing elective caesarean section after 37 weeks receive pre-operative corticosteroids?

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Aims Maternal antenatal corticosteroid administration prior to elective caesarean section (ECS) at < 39.0 weeks gestation reduces neonatal respiratory morbidity. Steroid therapy results in 'difficult to manage' hyperglycaemia in women with DIP, which can increase maternal and/or fetal risk. We have assessed whether neonates from pregnancies requiring ECS, complicated by DIP, between 37.0-38.9 weeks gestation, are at increased risk of respiratory distress (RDS).

Methods A literature review revealed insufficient evidence that antenatal corticosteroid therapy in women with diabetes was safe and effective. Obstetrics, paediatrics and endocrinology discussed this and agreed that women with DIP would not receive steroids after 36.6 weeks gestation over a 12-month period commencing on the 1st May 2017.

Clinical records provided a list of all women who underwent ECS between 1st May 2016 – 31st August 2016 (period 1) and 1st May 2017 – 31st August 2017 (period 2). All ECS occurring at ≤ 36.6 weeks gestation and ≥ 39 weeks gestation were excluded. A retrospective manual audit of these files was undertaken. The full audit is nearing completion: initial data are shown here.

Results Thirty-four women (15 DIP) underwent an ECS having received antenatal steroids in period 1. Four (26.7%) babies of DIP mothers were admitted to the SCN with RDS and 2 (13.3%) with hypoglycaemia. In comparison, during period 2, 52 women underwent an ECS (17 DIP). Only 2 (11.8%) babies of DIP mothers were admitted to the SCN with RDS and 2 babies (11.8%) with hypoglycaemia.

Conclusions Early results suggest that women with DIP undergoing ECS from 37.0-38.6 weeks gestation without prior steroid therapy are not likely to have a greater risk of RDS. Full results will soon be available.

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Impact of continuous glucose monitoring on perinatal costs and outcomes in pregnant women with type 1 diabetes: A cost analysis based on the outcomes of the CONCEPTT trial.

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Aims: This study compares monitoring costs and perinatal outcomes associated with continuous glucose monitoring (CGM) in addition to blood glucose monitoring (BGM) versus BGM alone when used in pregnant women with type 1 diabetes (T1D). The study was conducted in an Australian healthcare setting to inform decisions to improve access to CGM in this high-risk population.

Methods: Outcome data was derived from the CONCEPTT trial [1], an open-label, multicentre, randomised controlled study. Maternal and neonatal length of stay (LOS), caesarean births, pre-term births, and extended (>24 hours) neonatal intensive care (NIC) were compared between CGM and control arms of CONCEPTT. Costs are applied from an Australian healthcare perspective.

Results: CONCEPTT provided strong evidence of neonatal hospitalisation benefits in CGM vs control through reduced neonate length of stay (3.1 vs 4.0; p=0.0091), and a reduced incidence of extended (>24 hours) NIC (0.27 vs 0.43; p=0.0157). Incidence of pre-term births (<37 weeks) was similar

(p=0.57) between CGM (38%) and control (42%). CONCEPTT also identified trends in favour of CGM for reduced maternal LOS (3.5 vs 4.2 p=0.1), and reduced incidence of caesarean births, (63% vs 73%; p=0.18).

CGM is subsequently estimated to reduce neonatal hospitalisation costs by $2,105 (CGM: $14,679 vs control: $16,784), and maternal hospitalisation costs by $1,230 (CGM: $8,988 vs control $10,218). The addition of CGM to current standard practice, BGM, is estimated to cost an additional $2,250 in monitoring costs whilst providing savings of $3,335 in maternal and neonate hospitalisation costs.

Conclusions: Evidence from the CONCEPTT trial, applied to an Australian setting, suggests that maternal and neonatal hospitalisation benefits more than offset additional monitoring costs associated with using CGM for the duration of pregnancy in women with T1D. This analysis supports access to CGM for pregnant women with T1D.

1. Feig, D. et al. Continuous glucose monitoring in pregnant women with type 1 diabetes (CONCEPTT): a multicentre international randomised controlled trial. Lancet. 2017 Nov 25;390(10110):2347-2359

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ADIPS Guidelines

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ADIPS are in the process of updating the 2005 ADIPS Management of Diabetes in Pregnancy Guidelines. In this session, information regarding the update will be presented. There will be a process of wide stakeholder engagement.

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ADIPS Diabetes in Pregnancy Clinical Audit Programme

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Epidemiological and outcome data from pregnancies complicated by pre-existing diabetes and gestational diabetes are 'patchy' in Australia and New Zealand. There are some centres that retain an ongoing internal audit, while others have no systematic process to review their care. A national clinical audit programme can provide an implementation framework for those centres interested in reviewing and improving their care, and provide benchmarking support for those with established audit activities. ADIPS carried out a pilot study of 3 approaches to clinical audit (paper, stand alone electronic, networked electronic) across 9 different clinical settings (rural, urban, large proportion of indigenous, New Zealand) linked with a Benchmarking Centre in 2007 (*Australian and New Zealand Journal of Obstetrics and Gynaecology 2007;**47**:198–206*). Based on the findings of that exercise, and developments in the field since, a revised dataset, a data dictionary, a process for de-identification of patients and sites and proposed central data analysis and reporting site protocols have been developed to establish/pilot a clinical audit in 2018-2019. Aspects of Ethics and Permission need to be identified and defined. Local reports and a national report will be created allowing benchmarking of clinical performance across sites (*and against existing Clinical Guidelines and Best Practice*). The proposed system will only be able to support analysis of De-identified Electronic Data. It may be appropriate to establish systems for Type 1 and Type 2 diabetes only initially, although if GDM data exists, this would likely be possible. The audit process will be offered across all interested sites in Australasia and be undertaken at least every 12 months. A key issue currently is a source of ongoing funding for administration and benchmarking.

Thanks to the working group for their work.

NOTES

The conference acknowledges the support of: Medtronic