

Published literature as requested by the Committee.

Complied by Dr Sarah Price and A/Professor Alison Nankervis

1) Evidence for the use of insulin pumps in Type 2 Diabetes vs Type 1 Diabetes

- *Freckmann G, Buck S, Waldenmaier D, Kulzer B, Schnell O, Gelchsheimer U, Ziegler R, Heinemann L. Insulin Pump Therapy for Patients With Type 2 Diabetes Mellitus: Evidence, Current Barriers, and New Technologies. J Diabetes Sci Technol. 2021 Jul;15(4):901-915. doi: 10.1177/1932296820928100. Epub 2020 Jun 1. Erratum in: J Diabetes Sci Technol. 2021 Jun 16:19322968211027984. PMID: 32476471; PMCID: PMC8258526.*
- *Simmons D, Thompson CF, Conroy C, Scott DJ. Use of insulin pumps in pregnancies complicated by type 2 diabetes and gestational diabetes in a multiethnic community. Diabetes Care. 2001 Dec;24(12):2078-82. doi: 10.2337/diacare.24.12.2078. PMID: 11723086.*
- *McAuley SA, Vogrin S, Lee MH, Paldus B, Trawley S, de Bock MI, Abraham MB, Bach LA, Burt MG, Cohen ND, Colman PG, Davis EA, Hendrieckx C, Holmes-Walker DJ, Jenkins AJ, Kaye J, Keech AC, Kumareswaran K, MacIsaac RJ, McCallum RW, Sims CM, Speight J, Stranks SN, Sundararajan V, Ward GM, Jones TW, O'Neal DN; Australian JDRF Closed-Loop Research Group. Less Nocturnal Hypoglycemia but Equivalent Time in Range Among Adults with Type 1 Diabetes Using Insulin Pumps Versus Multiple Daily Injections. Diabetes Technol Ther. 2021 Jun;23(6):460-466. doi: 10.1089/dia.2020.0589. Epub 2021 Jan 27. PMID: 33351699.*
- *Lee TTM, Collett C, Bergford S, Hartnell S, Scott EM, Lindsay RS, Hunt KF, McCance DR, Barnard-Kelly K, Rankin D, Lawton J, Reynolds RM, Flanagan E, Hammond M, Shepstone L, Wilinska ME, Sibayan J, Kollman C, Beck R, Hovorka R, Murphy HR; AiDAPT Collaborative Group. Automated Insulin Delivery in Women with Pregnancy Complicated by Type 1 Diabetes. N Engl J Med. 2023 Oct 26;389(17):1566-1578. doi: 10.1056/NEJMoa2303911. Epub 2023 Oct 5. PMID: 37796241.*

Summary: Although pumps are safe for use in type 2 Diabetes, they are not recommended in national guidelines as there is little evidence that they provide benefit beyond multi-dose injections. In women with Type 1 Diabetes, pumps alone have benefits in reducing nocturnal hypoglycaemia. When combined with continuous glucose monitoring (ie. 'a closed loop'), women are 4 times more likely to achieve glycaemic targets in pregnancy.

2) Evidence for the link between elevated peri-conception diabetes control (as measured by HbA1c) and congenital birth defects.

- *Martin RB, Duryea EL, Ambia A, Ragsdale A, Mcintire D, Wells CE, Spong CY, Dashe JS, Nelson DB. Congenital Malformation Risk According to Hemoglobin A1c Values in a*

Contemporary Cohort with Pregestational Diabetes. Am J Perinatol. 2021 Oct;38(12):1217-1222. doi: 10.1055/s-0041-1730435. Epub 2021 Jun 4. PMID: 34087946.

- *Dude AM, Badreldin N, Schieler A, Yee LM. Periconception glycemic control and congenital anomalies in women with pregestational diabetes. BMJ Open Diabetes Res Care. 2021 Apr;9(1):e001966. doi: 10.1136/bmjdr-2020-001966. PMID: 33888543; PMCID: PMC8070859.*
- *He R, Hornberger LK, Kaur A, Crawford S, Boehme C, McBrien A, Eckersley L. Risk of major congenital heart disease in maternal diabetes is modified by hemoglobin A1c. Ultrasound Obstet Gynecol. 2023 Aug 18. doi: 10.1002/uog.27456. Epub ahead of print. PMID: 37594210.*
- *ORIGINAL SEMINAL PAPER: Miller E, Hare JW, Cloherty JP, Dunn PJ, Gleason RE, Soeldner JS, Kitzmiller JL. Elevated maternal hemoglobin A1c in early pregnancy and major congenital anomalies in infants of diabetic mothers. N Engl J Med. 1981 May 28;304(22):1331-4. doi: 10.1056/NEJM198105283042204. PMID: 7012627.*

Summary: As peri conceptual HbA1c increases, there is a proportionate risk in congenital anomalies in the offspring. A commonly quoted figure is that there is a 10% risk of congenital malformation in women who have an HbA1c of 10% in early pregnancy.

3) Guidelines for gestational weight gain in pregnancy

- *Rasmussen KM, Catalano PM, Yaktine AL. New guidelines for weight gain during pregnancy: what obstetrician/gynecologists should know. Curr Opin Obstet Gynecol. 2009 Dec;21(6):521-6. doi: 10.1097/GCO.0b013e328332d24e. PMID: 19809317; PMCID: PMC2847829.*
- <https://www.health.gov.au/resources/pregnancy-care-guidelines/part-d-clinical-assessments/weight-and-body-mass-index>

Summary: Institute of Medicine guidelines for Gestational Weight Gain were revised in 2013 and are included in the above references.

4) Who gains the most weight in pregnancy?

- *Sumithran P, Houlihan C, Shub A, Churilov L, Pritchard N, Price S, Ekinci E, Proietto J, Permezel M. How common is substantial weight gain after pregnancy? Obes Res Clin Pract. 2018 Mar-Apr;12(2):139-145. doi: 10.1016/j.orcp.2017.10.007. Epub 2017 Nov 21. PMID: 29170078.*

Summary: The women most likely to gain excessive weight in pregnancy are those women with pre-existing obesity.

5) IVF RANZCOG

- RANZCOG. Ovarian stimulation in assisted reproduction. (C-Gyn-2). Available from URL: <https://www.ranzcog.edu.au/college-statements-guidelines.html> (this is no longer freely accessible but is referred to in the article below)
- <https://ranzcog.edu.au/wp-content/uploads/2022/05/Management-of-Obesity-in-Pregnancy.pdf>
- Tremellen K, Wilkinson D, Savulescu J. Should obese women's access to assisted fertility treatment be limited? A scientific and ethical analysis. *Aust N Z J Obstet Gynaecol.* 2017 Oct;57(5):569-574. doi: 10.1111/ajo.12600. Epub 2017 Mar 16. PMID: 28299785.

Summary: Body mass index (either BMI >35 or BMI >40kg/m²) is a factor that can limit access to assisted reproduction. The appropriateness of this limitation is controversial.

6) Breast-feeding rates in women with diabetes

- Overall exclusive breast-feeding rate at Royal Women's Hospital (Melbourne) was between 60-73% when audited monthly in 2023.
- Simmons D, Conroy C, Thompson CF. In-hospital breast feeding rates among women with gestational diabetes and pregestational Type 2 diabetes in South Auckland. *Diabet Med.* 2005 Feb;22(2):177-81. doi: 10.1111/j.1464-5491.2004.01379.x. PMID: 15660735.
- Longmore DK, Barr ELM, Wilson AN, Barzi F, Kirkwood M, Simmonds A, Lee IL, Hawthorne E, Van Dokkum P, Connors C, Boyle JA, Zimmet P, O'Dea K, Oats J, McIntyre HD, Brown ADH, Shaw JE, Maple-Brown LJ. Associations of gestational diabetes and type 2 diabetes during pregnancy with breastfeeding at hospital discharge and up to 6 months: the PANDORA study. *Diabetologia.* 2020 Dec;63(12):2571-2581. doi: 10.1007/s00125-020-05271-9. Epub 2020 Sep 10. PMID: 32910247.
- Matias SL, Dewey KG, Quesenberry CP Jr, Gunderson EP. Maternal prepregnancy obesity and insulin treatment during pregnancy are independently associated with delayed lactogenesis in women with recent gestational diabetes mellitus. *Am J Clin Nutr.* 2014 Jan;99(1):115-21. doi: 10.3945/ajcn.113.073049. Epub 2013 Nov 6. PMID: 24196401; PMCID: PMC3862450.

Summary: Breast-feeding rates are lower in women with pre-existing diabetes compared to women without diabetes despite the accepted metabolic benefits for both mother and baby. In part, this may be related to delayed lactogenesis (onset of milk production) in women with diabetes and obesity.