

Australian Diabetes Society

The Peak Medical and Scientific Organisation on Diabetes in Australia

To the PBS committee,
Please find below our submission to the insulin pump review.

8. Determine the clinical outcomes (e.g. HbA1C, health-related quality of life, and other potential benefits and harms) for people with type 1 diabetes) of insulin pump therapy. In this, consideration should be given to different age groups, with a particular reference to those under 18 who may be eligible for the Insulin Pump Program which is funded by the Australian Government;

There is clear evidence that use of insulin pumps improves HbA1c in adults and children with type 1 diabetes [1-3]. Hypoglycaemia was not increased in those studies, and in some studies was significantly decreased despite lower HbA1c [3]. In the STAR3 trial, HbA1c improved 0.7-0.8%, which is roughly comparable to the improvement in the DCCT study. Improved glucose control in the DCCT study decreased new onset of or progression of diabetes complications by 39-76% [4].

In women already using insulin pumps, use should be continued in pregnancy. Initiation during pregnancy requires very intensive education and monitoring to avoid ketoacidosis, but can be beneficial for glucose control in a carefully selected subset if supported by a diabetes team with expertise in insulin pump therapy.

Insulin pumps compare well for cost per quality of life year (QALY) gained when compared to multiple daily injections [5-7]. Use has been examined in both adults and adolescents. The STAR3 trial implies that use with continuous glucose sensors (incorporated into some of the more expensive pumps) may further improve glycaemic control on pumps [2].

As yet unpublished data (available on request) from the Islet Transplant Program at Westmead shows that adults with T1D and recurrent severe hypoglycaemia (the major criteria for being on that transplant wait-list) switching from multiple daily injections (MDI) to pumps significantly improved hypoglycaemia frequency and severity. Hypo-score fell from 1960 to 1079, $p < 0.001$. Improving access to pump therapy for adults with recurrent severe hypoglycaemia, which constitute around 1-3% of the type I diabetes population, should be supported

Patients with T1D clearly prefer insulin pumps: the rate of switching back to multiple daily injections is 1.5% (AIHW), in people accessing the Australian pump supply program.

9. Investigate the cost-effective use of different insulin pumps available under the Insulin Pump Program; and

The STAR3 trial implies that use with continuous glucose sensors (incorporated into some of the more expensive pumps) may further improve glycaemic control in patients on pumps [2].

10. Consider the clinical criteria and eligibility under the Insulin Pump Program, to ensure those who would most benefit from insulin pump therapy receive support to assist in their care.

The *clinical* criteria for children are generally reasonable. Adults with type 1 diabetes who meet the eligibility criteria should also benefit from the scheme and it should be extended to qualifying adults: selecting only economically disadvantaged people <18 is discriminatory.

Australian Diabetes Society

The Peak Medical and Scientific Organisation on Diabetes in Australia

Clinical criteria and eligibility: Many people who have low family earnings cannot afford the 20% co-payment. In the past, this has significantly limited access to the scheme by people who need the assistance the most. The very rapid consumption of all funds in the most recent round after providing assistance for the 20% co-payment demonstrates this point.

Mental status, motivation and cognitive ability are important for successful pump usage, and should continue to be considered in patient selection for pump usage.

We note that use in very young children remains somewhat controversial. Very young children should preferably be started on pumps in conjunction with a paediatric endocrinologist. Travel to a specialist / metropolitan centre would be supported for these people under other schemes.

There are few trials in type 2 diabetes, and based on those, insulin pumps are not indicated for the majority of people with T2D [3].

The NHMRC National Evidence-Based Clinical Care Guidelines for Type 1 Diabetes for Children, Adolescents and Adults provides a review of the evidence.

1. Weissberg-Benchell J, Antisdel-Lomaglio J, Seshadri R. (2003). Insulin Pump Therapy: A meta-analysis. *Diabetes Care*.26(4):1079-1087.
2. Bergenstal RM, Tamborlane WV, Ahmann A, Buse JB, Dailey G, et al. (2010). Effectiveness of Sensor-Augmented Insulin-Pump Therapy in Type 1 Diabetes. *New England Journal of Medicine*.363(4):311-320.
3. Grunberger G, Bailey TS, Cohen AJ, Flood TM, Handelsman Y, et al. (2010). Statement by the American Association of Clinical Endocrinologists consensus panel on insulin pump management. *Endocrine Practice*.16(5):746-762.
4. DCCT_Group. (1993). The Effect of Intensive Treatment of Diabetes on the Development and Progression of Long-Term Complications in Insulin-Dependent Diabetes Mellitus. *New England Journal of Medicine*.329(14):977-986.
5. Charles MES, Sadri H, Minshall ME, Tunis SL. (2009). Health economic comparison between continuous subcutaneous insulin infusion and multiple daily injections of insulin for the treatment of adult type 1 diabetes in Canada. *Clinical therapeutics*.31(3):657-667.
6. Cummins E, Royle P, Snaith A, Greene A, Robertson L, et al. (2010). Clinical effectiveness and cost-effectiveness of continuous subcutaneous insulin infusion for diabetes: systematic review and economic evaluation. *Health Technology Assessment*.14(11):1-208.
7. St Charles M, Lynch P, Graham C, Minshall ME. (2009). A cost-effectiveness analysis of continuous subcutaneous insulin injection versus multiple daily injections in type 1 diabetes patients: A third-party US payer perspective. *Value in Health*.12(5):674-686.



Yours sincerely,
A/Prof. Jenny Gunton