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### **The Impact of an Insulin/Carbohydrate Adjustment Algorithm App on Individual Blood Glucose Management During Planned Exercise**

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# Title IMPACT OF AN INSULIN/CARBOHYDRATE ADJUSTMENT ALGORITHM APP ON INDIVIDUAL BLOOD GLUCOSE MANAGEMENT DURING PLANNED EXERCISE

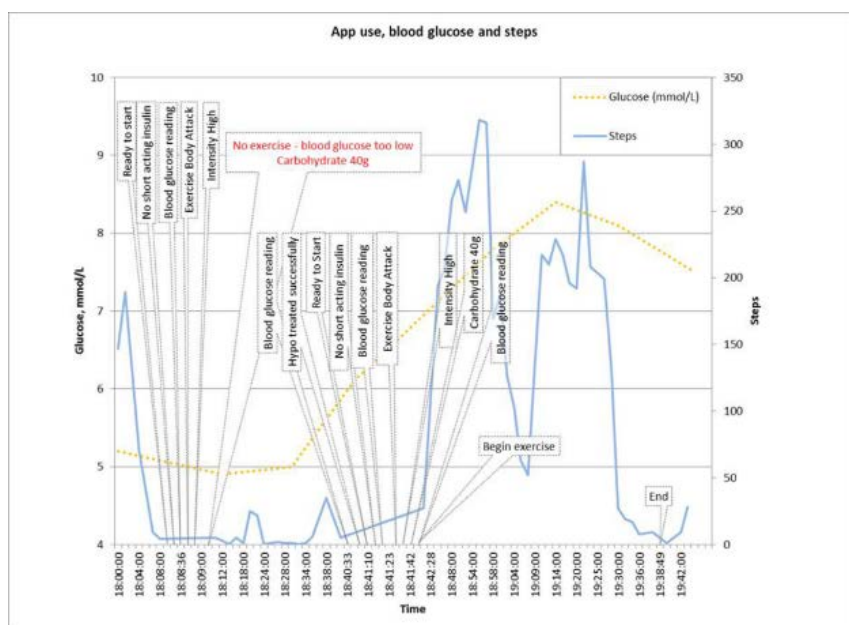
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**Background and Aims** Risk of hypoglycaemia is a significant barrier to undertaking physical exercise among people with type 1 diabetes. An app based on a personalised prediction algorithm is being developed for people with type 1 diabetes to optimise blood glucose control associated with physical activity. Incorporation of case-based reasoning and linkage with online structured education is being explored for personalisation.

**Methods** Physically active people with type 1 diabetes (n=10) were recruited using a Facebook forum to test a co-produced app based on an insulin/carbohydrate adjustment algorithm. Participants wore Actigraph-GT3X activity monitors and Libre Freestyle blood glucose meters over the eight week study period. Physical activity, blood glucose and app use timelines for individual participants were analysed to assess the impact of the app on planned activity.

**Results** A total of 119 app uses were logged, with an average of 3 uses per week per user across a range of activities. An example of app use is shown. Once ready to exercise, blood glucose and activity/intensity were entered. The app indicated that blood glucose was too low, recommended carbohydrate consumption and retesting blood glucose before undertaking the selected exercise intensity. Advice was followed and 30 minutes later, with low blood glucose treated, the participant had a successful exercise session.



**Conclusions** Use of the app improved blood glucose levels during and after exercise for some participants. For other participants it highlighted that “one-size-fits-all” advice may not be appropriate, supporting the use of case-based reasoning, even for people already confident in managing their diabetes during physical activity.