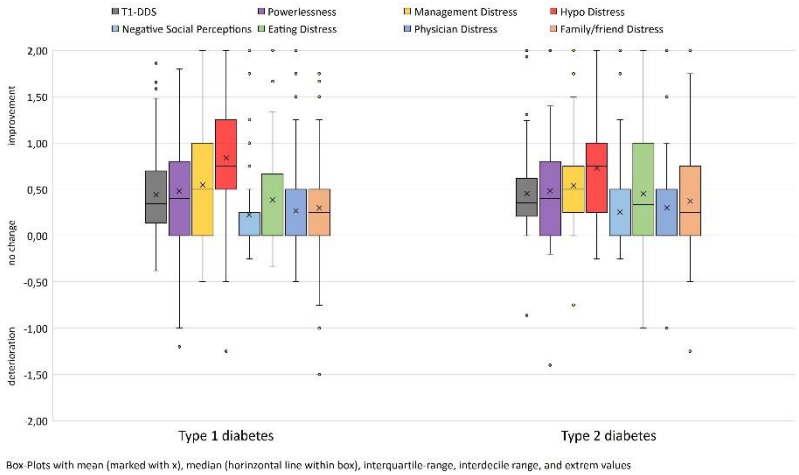
Anticipated reduction in hypoglycaemia fear and diabetes distress from increasing the glucose prediction of current CGM algorithms

D. Ehrmann[1], T. Glatzer[2], N. Babio[2], L. Priesterroth[1], B. Olesen[1], B. Kulzer[1], N. Hermanns[1];
[1]FIDAM - Research Institute Diabetes Academy Mergentheim, Bad Mergentheim, Germany, [2]Roche Diabetes Care GmbH, Mannheim, Germany.

Background and aims: Hypoglycaemia remains the limiting factor of insulin therapy, also because people with diabetes often have increased fear of hypoglycaemia and distress due to hypoglycaemia. Continuous glucose monitoring (CGM) is a powerful tool to alleviate these fears and burden. However, current CGM algorithms only allow a prediction of glucose values within the next 15-30 minutes, making glucose management rather unpredictable. To elaborate on the potential to improve current CGM systems, we investigated if a possible increase in this prediction window to up to 2 hours would be perceived as a significant benefit with regard to hypoglycaemia fear and diabetes distress.
Materials and methods: People with type 1 and type 2 diabetes who were using a CGM system were invited to participate in an online survey from the dia·link online panel. Participants were presented with scenarios depicting the potential of a hypothetical CGM algorithm to predict the course of glucose for up to 2 hours. They were instructed to imagine how such a long-term prediction would affect their personal diabetes management. They were asked to complete the Hypoglycemia Fear Survey (HFS-II) and T1-Diabetes Distress Scale (T1-DDS) and rate each item in terms of the potential change that they would expect by using such a long-term glucose prediction (scale: -2 strong deterioration, -1 deterioration, 0 no change, 1 improvement, 2 strong improvement).
Results: A total of 206 people with diabetes participated (29.1% type 2 diabetes; type 1: age 53.8±13.7 years, 56.2% female, HbA1c 6.9±0.8%; type 2: age 64.9±9.3 years, 21.7% female, HbA1c 7.2±1.2%). Participants expected moderate improvements in HFS-II scores (0.57±0,49). People with insulin pump therapy showed greatest anticipated improvements in hypoglycaemia fear (0.65±0.48), followed by people with non-intensified insulin therapy (0.55±0.49) and people with multiple daily injection therapy (0.47±0.49) (p = 0.037). Similar anticipated improvements were seen in hypoglycaemia and management distress (Box plots shown in Figure 1 for T1-DDS). However, anticipated improvements in diabetes distress did not differ for type of therapy (all p>0.10) or type of diabetes (p = 0.252).
Conclusion: Increasing the glucose prediction to up to 2 hours were seen as a potential improvement regarding reductions in fear of hypoglycaemia and hypoglycaemia distress and by both people with type 1 and type 2 diabetes participating in the study. Interestingly, people with insulin pump therapy anticipated the greatest effect of such a long-term prediction regarding fear of hypoglycaemia.



Box-Plots with mean (marked with x), median (horinzontal line within box), interquartile-range, interdecile range, and extrem values

Supported by: The study was funded by Roche Diabetes Care
Disclosure: **D. Ehrmann:** Employment/Consultancy; Roche Diabetes Care, Dexcom Germany. Lecture/other fees; Roche Diabetes Care, Dexcom.