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Background

Continuous glucose monitoring (CGM) by means of needle sensors is becoming a standard measure in routine care of patients with type 1 and type 2 diabetes mellitus. Little is known, however, about the reaction of the glucose oxidase-based sensor technology to potentially interfering nutritional or pharmaceutical substances. Here, we report on results obtained with Dexcom G6 and Dexcom G7 needle sensors with our in-vitro dynamic interference testing method.

Methods

Three sensors from each sensor generation were exposed to substance gradients from zero to supraphysiological concentrations generated by HPLC-pumps at a stable glucose concentration of 200 mg/dL. YSI Stat 2300 Plus was used as the glucose reference method. Interference was assumed if the CGM needle sensors showed a mean bias of more than ±10% from baseline with a tested substance at any given substance concentration.

Results

Interference (%bias at the highest concentration tested from baseline, G6/G7) was seen with the following substances: acetaminophen: >100%/>100%, hydroxyurea: >100%/>100%, dithiothreitol: -18%/-11%, ethyl alcohol 12%/12%, galactose: 17%/21%, gentisic acid: 18%/27%, L-cysteine: -25%/-12%, L-dopa: 11%/14%, mannose: 20%/15%, methyldopa: 14%/15%; N-acetyl-cysteine: 18%/14%, and uric acid: 33%/32%. In addition, G7 signals were also influenced by xylose (14%, G6: 7%).

Fig.1 CGM: Dynamic interference test method.

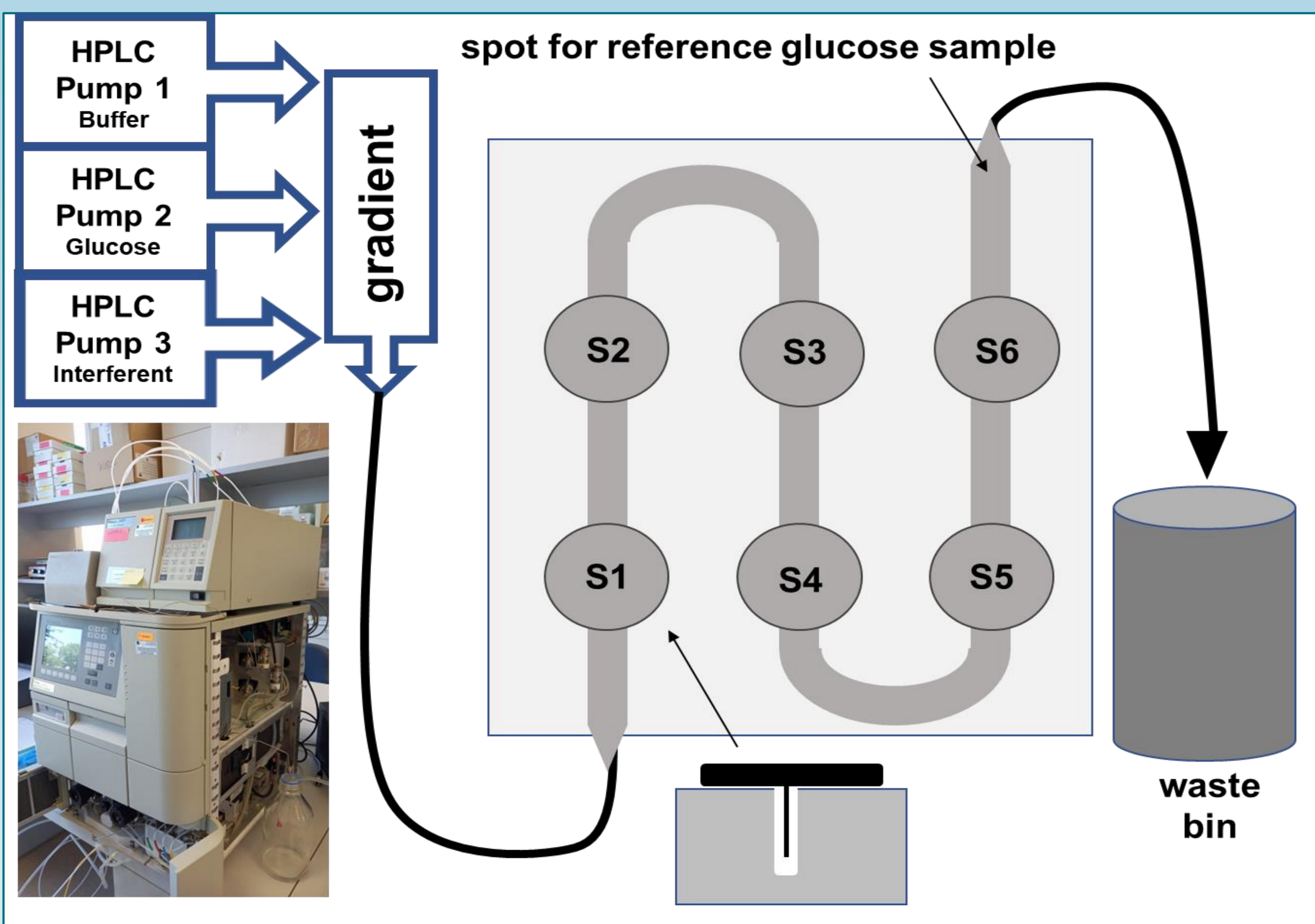


Fig.2 Dexcom G6 & G7 interference by 13 substances

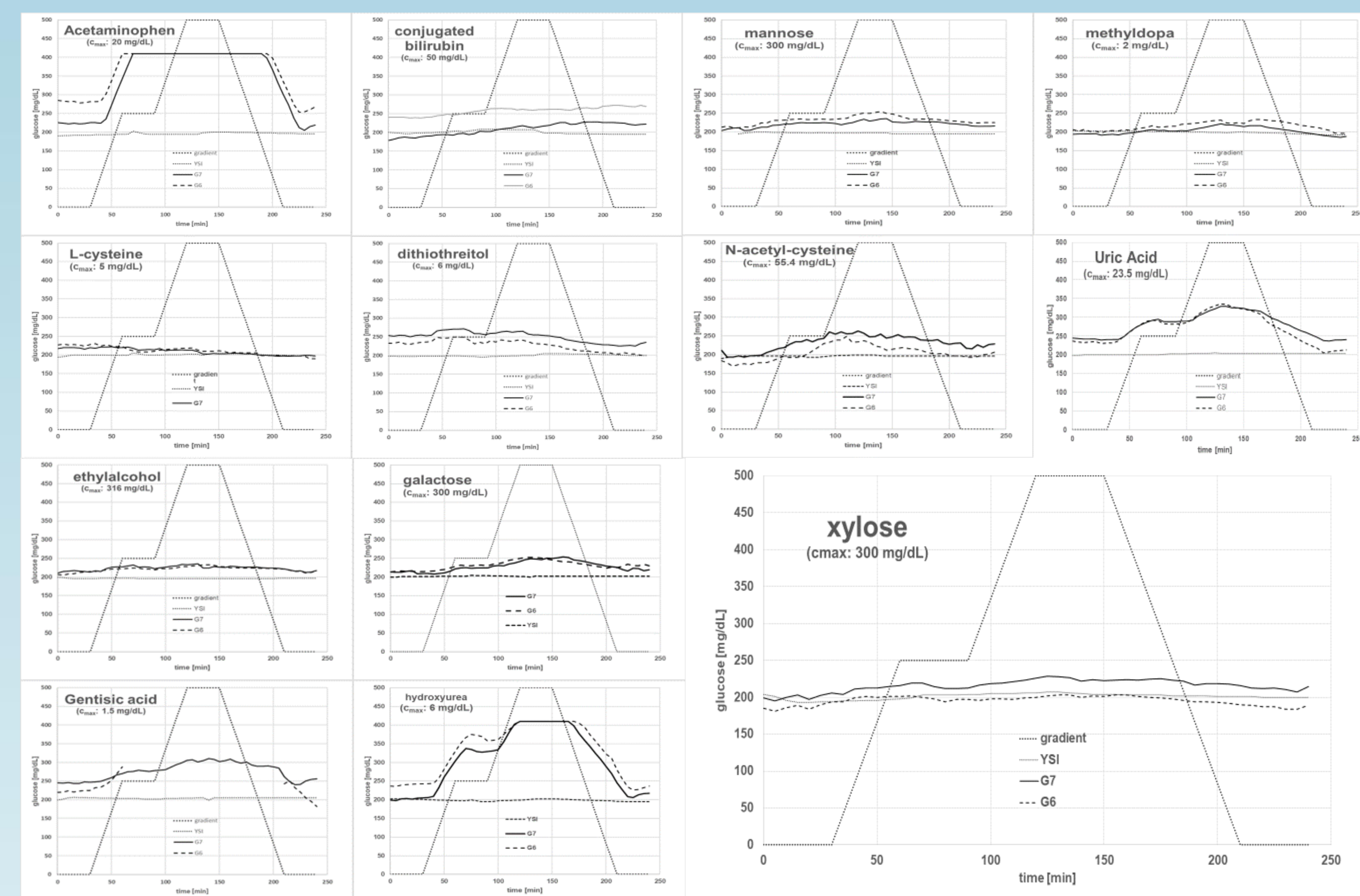


Table 1. interfering substances

Table with 4 columns: Substance, Maximum Concentration tested, Bias over baseline (G6, G7), and Type of substance. Lists 13 substances and their interference levels.

Conclusions

The Dexcom G7 sensor showed a similar interference pattern as previously observed with G6. There does not seem to be a major difference in the next generation G7 sensor technology compared to G6. The clinical relevance of our findings for routine care should now best be investigated in appropriately designed clinical studies.

Reference:

Pfützner A, Jensch H, Cardinal C, Srikanthamoorthy G, Riehn E, Thomé N. Laboratory Protocol and Pilot Results for Dynamic Interference Testing of Continuous Glucose Monitoring Sensors. J Diabetes Sci Technol. 2022;19322968221095573. doi: 10.1177/19322968221095573. PMID: 35549522.

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