Table (abstract 12):

Table 1. Predictive value of CGM variables and outcomes of interest

CGM Variables	BMI Z-Score (3 year) †	FEV1 (3 year) †	FVC (3 year) †	Time to CFRD Dx ‡	Time to Insulin Start ‡
Mean Glucose	0.008	-0.027	-0.027	1.23 (1.03, 1.47)*	1.20 (1.05, 1.36)**
% Time Spent >140 mg/dL	0.007	-0.072	-0.089	1.22 (1.03, 1.44)*	1.16 (1.04, 1.29)**
% Time Spent >200 mg/dL	-0.016	0.109	-0.048	1.40 (0.78, 2.50)	1.53 (0.96, 2.42)
Coefficient of Variation	-0.015	0.152	0.056	1.06 (0.68, 1.65)	1.19 (0.85, 1.68)
MAGE	0.001	0.074	0.042	1.03 (0.95, 1.11)	1.09 (1.02, 1.16)*

†Value presented is the slope derived from fixed-effects models.
‡Value presented is the hazard ratio (95% confidence interval) for a 5-unit increase in the CGM variable.
*$p < 0.05$ ** $p < 0.01$.

percentage of time spent at greater than 200 mg/dL,1.3 ± 3.1%; coefficient of variation, 20 ± 6; and mean amplitude of glycemic excursion, 72 ± 35 mg/dL. CGM variables did not predict change in BMI-z, FEV_1pp, or FVCpp at 1 or 3 years after baseline (Table 1). For every 5-unit increase in CGM mean glucose and CGM percentage of time spent at greater than 140 mg/dL, there was a 22% to 23% greater risk of developing CFRD ($p < 0.05$). The odds of insulin start was also greater with every 5-unit increase in these CGM parameters ($p < 0.01$, Table 1). A 5-unit change in CGM mean amplitude of glycemic excursion, a measure of glycemic variability, was also associated with greater risk of starting insulin ($p < 0.05$, Table 1).

Conclusions: The CGM variables explored in this group of relatively healthy, young individuals with CF who were not yet on insulin did not predict clinical decline as measured according to 1- and 3-year changes in BMI z-score, FEV_1pp, or FVCpp, although mean glucose, percentage of time spent at greater than 140 mg/dL, and mean amplitude of glycemic excursion on CGM were associated with greater odds of developing CFRD and requiring insulin over the study period.

Acknowledgements: This study was supported by funding from Cystic Fibrosis Foundation (CFF) grant CHAN16A0, CFF Student Traineeship Award LORENZ22H0, and UL1 TR001082 (CCTSI and REDCap).

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A North American provider survey of cystic fibrosis–related diabetes screening practices

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Background: Cystic fibrosis (CF)-related diabetes (CFRD) is highly prevalent in approximately 15% of teens and 50% of adults with CF. CFRD is associated with declining pulmonary function, pulmonary exacerbations, poor nutritional status, and greater risk of mortality; its onset is often insidious. Guidelines recommend a 2-hour oral glucose tolerance test (OGTT) annually for people with CF aged 10 and older, but Cystic Fibrosis Foundation patient registry data have demonstrated consistently low OGTT screening rates (<30% of adults, <60% of youth nationally). Our aims were to conduct a survey of U.S. CF center directors and endocrinologists affiliated with the EnVision program to characterize CFRD screening practices, better understand provider perceived barriers to screening, and identify potential strategies to increase CFRD screening.

Methods: Two REDCap surveys consisting of 23 questions pertaining to CFRD screening practices were developed. Questions were asked regarding CF center practice settings and population demographic characteristics, details about how OGTTs were performed, use of alternate diabetes screening strategies, and perceived barriers. The endocrinologist survey included additional questions regarding interpretation and practice management based on OGTT results and other measures of glycemia. The link to survey 1 was emailed to CF center directors, who could designate an alternate individual at their discretion. The link to survey 2 was sent out via group email distribution to mentors and mentees within EnVision I and II, a CFF program to foster endocrinologists in the care of CF-related endocrinopathies. Survey responses were summarized using means and standard deviations or medians and first and third quartiles for continuous variables and frequencies with percentages for categorical variables. Practices were compared using t-tests or chi-square tests depending on distribution of variables. Data were summarized and analyzed in R.

Results: The survey response rate was 20.3% (59/290) for CF centers and 62.5% (25/40) for endocrinologists. Fifty-seven percent of CF centers surveyed obtain 0- and 120-minute glucose values; 38% obtain 0-, 60-, and 120-minute values; and 4% obtain additional values. Of endocrinologists surveyed, 20% obtain 0- and 120-minute glucose values, 72% obtain 0-, 60-, and 120-minute values, and 8% obtain additional values. Forty-nine percent of CF centers reported greater than 50% OGTT completion in the previous year. Centers that always or almost always provide reminders to patients are about 5 times as likely to have OGTT completion rates greater than 50% ($p = 0.02$). CF centers and endocrinologists reported using alternative strategies to evaluate for diabetes, such as glycosylated hemoglobin (23.0%, 28.6%), fasting plasma glucose (17.7%, 20.8%), continuous glucose monitoring (10.8%, 18.2%), and fingerstick monitoring (20%, 15.6%), respectively.

Conclusions: Although OGTT is considered the gold standard screening method for CFRD, practice variation exists, completion rates are suboptimal, and many providers are using alternate glycemia screening methods. Having a reminder system for scheduling OGTTs may increase completion rates. Studies to improve our approach to CFRD screening are urgently needed.

Acknowledgements: This work was supported by the Cystic Fibrosis Foundation (grants HICKS19GE0, MORAN19GE3) and STATNET (grant ZEMANI20Y7).