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4T Study: Changing Clinical Processes Increases Technology Use at T1D Diagnosis

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Abstract:

Use of diabetes technology (CGM, pump) is recommended for people with T1D, and early CGM initiation leads to improved glucose values. We compare %CGM and %pump use and time to initiation from T1D diagnosis in the Historical cohort, 4T Pilot, and 4T Study 1 and the associated workflow changes to increase early technology use.

CGM initiation within 30 days of diagnosis increased from 2% in the historical cohort to 92% in Pilot 4T to 98% in 4T Study 1 (Table). Days to pump initiation from T1D diagnosis decreased from 272 in the historical cohort to 144 days in Study 1.

From 2014-2016 pumps and CGM were initiated when families expressed interest or if the provider discussed them. Families were required to attend a pre-pump class where the CDCES introduced pumps and CGMs prior to starting technology. During the 4T Pilot and 4T Study 1, CGMs were introduced and started during the first month of diagnosis. In Study 1, families were encouraged to attend pump class and initiate AID. The CDCES team does the CGM teach, CGM follow-up, pre-pump classes, and insulin pump starts for the families in preferred language. In 4T Study 2 (enrolling) standard of care is to complete a pre-pump class in the first 3 months after diagnosis.

Changes in processes can lead to early implementation of diabetes technology. A structured, team-based process to introduce, reduce barriers, and encourage families to utilize diabetes technology increases early initiation.

Table			
	Historical	Pilot 4T	4T Study 1
	(2014-2016)	(2018-2020)	(2020-2022)
Patients (n)	272	135	133
Baseline Characteristics			
Age at T1D diagnosis, median [Q1, Q3], years	10 [7, 13]	10 [7, 13]	11 [7, 14]
Male, n (%)	137 (50)	71 (53)	73 (55)
Race/Ethnicity, n (%)			
Non-Hispanic White	119 (44)	53 (39)	53 (40)
HbA1c (%) at T1D Diagnosis, mean (SD)	10.7 (2.5)	12.2 (2.1)	12.2 (2.4)
Insurance Type, n (%)			
Private	197 (72)	104 (77)	83 (62)
Primary Language, n (%)			
English	NA	117 (87)	112 (84)
Follow-up Characteristics			
CGM initiation, n (%)	153 (56)	135 (100)	133 (100)
Early Initiation (<=30 days)	5 (2)	124 (92)	131 (98)
Days to CGM Initiation, median [Q1, Q3]	221 [91, 557]	7 [5, 11]	10 [6, 18]
Insulin pump use, n (%)	134 (49)	72 (53)	60 (45)
Open loop	134 (49)	38 (28)	33 (55)
Predictive low glucose suspend	0 (0)	18 (13)	1 (2)
Hybrid closed loop	0 (0)	32 (24)	26 (43)
None	97 (36)	63 (47)	73 (55)
Unknown	41 (15)	0 (0)	0 (0)
Days to pump initiation, median (Q1-Q3)	272 (157-453)	212 (127-384)	144 (85-257)

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