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SUPPLEMENTARY INFORMATION

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An artificial intelligence decision support system for the management of type 1 diabetes

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Supplementary Table 1| Description of real-world human datasets used for KNN-DSS engine evaluation.

Dataset name	Purpose of dataset use and analysis	Description of data	Study details
Study 1	To compute agreement between KNN-DSS recommendations and endocrinologist recommendations	Continuous glucose monitor Bluetooth-enabled insulin pen Activity monitor device Exercise activity log Meal content and size User adherence to bolus calculations	*Participants:* 25 adults with type 1 diabetes who undergo multiple daily injection therapy. *Design:* Subjects participated in a 28-day study of multiple injection therapy to evaluate a new mobile app interface and collect data reflecting CGM-augmented MDI therapy. Physicians individually reviewed data from separate participants on a weekly basis and recommended changes to insulin therapy. Fifteen of the participants were given physician-reviewed recommendations provided by the KNN-DSS.
Study 2	To compute inter-physician variability in recommendations	Continuous glucose monitor Insulin pump infusion rate Insulin bolus calculations Activity monitor device Exercise announcements Meal content Retrospective physician recommendations for insulin titration	*Cited:* Reddy et. al[30] *Participants:* 10 adults with type 1 diabetes undergoing open-loop insulin pump therapy. *Design:* Subjects participated in a 30-day study evaluating overnight glycemic response to aerobic and anaerobic exercise. Following completion of the study, a group of physicians individually and collectively reviewed the all participant data and identified recommended changes to insulin therapy.

Study 3	To design real-world meal scenarios to evaluate use of the KNN-DSS *in silico*	Meal scenarios including carbohydrate content and time of consumption	*Cited:* Castle et. al[31] *Participants:* 20 adults with type 1 diabetes undergoing open-loop insulin pump therapy. *Design:* Subjects participated a 4-arm study evaluating closed-loop automated insulin delivery algorithms. Each arm of the study lasted 4 days. Participant recorded meal scenarios and rescue carbs throughout the study.

Supplementary Table 2| Agreement of recommendations delivered by individual endocrinologists.

Recommendation Comparison	% Agreement	% Disagreement	% Additional	% Not comparable
Calculated Agreement between Endocrinologists using Real-world Human Data				
Assessing agreement between individual physicians	*Full* 41.2 *Partial* 14.7 Overall **55.9**	*Full* 0.3 *Partial* 2.8 Overall **3.1**	**32.6**	**8.4**
Assessing agreement between physicians and a consensus recommendation	*Full* 63.3 *Partial* 6.8 Overall **70.1**	*Full* 0.1 *Partial* 0.6 Overall **0.7**	**24.1**	**5.1**

Agreement is calculated using the Sorenson-Dice coefficient similarity between physician recommendations for each segment of participant data (Equation 6).

Supplementary Table 3| Evaluation of KNN-DSS *in silico*.

In silico Evaluation				
OHSU Simulator (N = 29)	**Baseline**	**Week 4**	**Week 12**	**End of Study**
% time-in-range ***(p-value, d = effect size, CI = confidence interval)***	59.5%± 22.8	68.6 ±17.2% *(p=2E-3, d = 0.64, CI = [3.7,14.5])*	79.8 ± 7.3% *(p=2E-5, d = 0.96, CI = [12.3,28.4])*	81.1 ± 6.8% *(p=9E-6, d = 1.01, CI = [13.4,29.8])*
% time-in-hypoglycemia	0.74 [0.04, 2.88] %	0.69 [0.50, 1.35]% *(p= 0.24, d = 0.41)*	1.14 [0.63, 1.41]% *(p= 0.79, d = 0.28)*	0.89 [0.66, 1.35]% *(p= 0.69, d = 0.32)*
UVA Simulator (N = 100)	**Baseline**	**Week 4**	**Week 12**	**End of Study**
% time-in-range	75.1% ± 16.1	77.2% ± 17.6 *(p= 2E-1, d = 0.14, CI = [-0.7,5.0])*	79.6% ± 15.4 *(p= 1E-2, d = 0.25, CI = [0.9,8.0])*	81.8% ± 13.9 *(p= 1E-4, d = 0.39, CI = [3.3,9.9])*
% time-in-hypoglycemia	4.0 [1.1, 13.9] %	1.22 [0, 2.2] % *(p=1E-12, d = 0.79)*	0.79 [0, 1.6] % *(p=2E-12, d = 0.78)*	0.55 [0, 1.2] % *(p=2E-12, d = 0.81)*

Simulation of engine use was performed using two virtual patient populations with outcomes determined at weeks 1, 4, 12, and the end of the virtual study. Target range is defined as glucose measured between 70-180 mg dL^-1. Effect sizes larger than d = 0.5 are considered moderate, while effect sizes greater than d = 0.8 are considered substantial. Degrees of freedom in statistical tests are df = 99 and df = 28 for the UVA simulator and OHSU T1D simulator, respectively. A students two-tailed, paired t-test of alpha = 0.05 was used to compare percent time-in-range from the start of the study to week 4, 12, and study completion. A two-tailed Wilcoxon signed-rank test was used to compare percent time-in-hypoglycemia from the start of the study to week 4, 12, and study completion.

Supplementary Table 4 | Imposed errors in insulin dosing.

Insulin Dosing Scenario	Implementation
No Dosing Error	No change to user settings
Postprandial Hypoglycemia	Dosing 20% more insulin than recommended
Severe Postprandial Hypoglycemia	Dosing 40% more insulin than recommended
Postprandial Hyperglycemia	Dosing 20% less insulin than recommended
Severe Postprandial Hyperglycemia	Dosing 40% less insulin than recommended
Aggressive Basal	Dosing 40% more basal than recommended
Insufficient Basal	Dosing 40% less basal than recommended
Aggressive Basal and Insufficient Bolus	Dosing 40% more basal than recommended, and 40% less meal bolus than recommended
Aggressive Basal with Aggressive Bolus	Dosing 40% more basal than recommended, and 40% more meal bolus than recommended
Insufficient Basal with Insufficient Bolus	Dosing 40% less basal than recommended, and 40% less meal bolus than recommended
Insufficient Basal with Aggressive Bolus	Dosing 40% less basal than recommended, and 40% more meal bolus than recommended
Insufficient Basal with Aggressive Correction Bolus	Dosing 40% less basal than recommended, and 40% more correction bolus than recommended
Insufficient Basal with Insufficient Correction Bolus	Dosing 40% less basal than recommended, and 40% less correction bolus than recommended
Adherence to bolus calculators *	Dosing less than or more than indicated by the bolus calculator, by a value of 30%.

* indicates that the imposed error was not used during training-set generation, but was used during KNN-DSS engine validation.

Supplementary Table 5| Results of in silico validation using the UVA-Padova simulator.

In silico Evaluation				
ADULTS UVA Simulator (N = 100)	**Baseline**	**Week 4**	**Week 12**	**End of Study**
% time-in-range ***(p-value, d = effect size, CI = confidence interval)***	75.1% ± 16.1	77.2% ± 17.6 *(p= 2E-1, d = 0.14, CI = [-0.7,5.0])*	79.6% ± 15.4 *(p= 1E-2, d = 0.25, CI = [0.9,8.0])*	81.8% ± 13.9 *(p= 1E-4, d = 0.39, CI = [3.3,9.9])*
% time-in-hypoglycemia	4.0 [1.1, 13.9]	1.22 [0,2.2] *(p=1E-12, d = 0.79)*	0.79 [0,1.6] *(p=2E-12, d = 0.78)*	0.55 [0,1.2] *(p=2E-12, d = 0.81)*
ADOLESCENTS UVA Simulator (N = 100)	**Baseline**	**Week 4**	**Week 12**	**End of Study**
% time-in-range ***(p-value, d = effect size, CI = confidence interval)***	68.2 ± 13.2	73.9 ± 12.7 *(p= 2E-12, d = .80, CI =[4.3, 7.1])*	75.2 ± 12.2 *(p= 8E-9, d = 0.63, CI = [4.8, 9.2])*	77.4 ± 12.9 *(p= 2E-10, d = 0.71, CI =[6.6,11.7])*
% time-in-hypoglycemia	6.27 [1.7,12.1]	2.31 [1.0,4.1] *(p= 3E-13, d= 0.85)*	2.03 [0.8,3.5] *(p= 4E-11, d =0.75)*	2.08 [1.1,3.4] *(p=9E-12, d = 0.76)*
PEDIATRIC UVA Simulator (N = 99*)	**Baseline**	**Week 4**	**Week 12**	**End of Study**
% time-in-range ***(p-value, d = effect size, CI = confidence interval)***	65.7% ± 16.9	69.4% ± 16.0 *(p= 2E-4, d = 0.38, CI = [1.8,5.5])*	69.1% ± 15.4 *(p= 2E-2, d = 0.24, CI = [0.6,6.2])*	71.6% ± 16.3 *(p= 5E-4, d = 0.36, CI = [2.6,9.1])*
% time-in-hypoglycemia	4.12 [1.5,9.7]	2.48 [1.1,4.2] *(p=1E-7, d =0.58)*	2.03 [1.0,3.4] *(p=1E-7, d =0.59)*	2.13 [1.1,3.4] *(p=7E-8, d =0.59)*

* indicates one subject was excluded due to computational errors in the simulation. Simulation of engine use was performed with outcomes determined at weeks 1, 4, 12, and the end of the virtual study. Target range is defined as glucose measured between 70-180 mg dL^-1. Effect sizes larger than d = 0.5 are considered moderate, while effect sizes greater than d = 0.8 are considered substantial. A students two-tailed, paired t-test of alpha = 0.05 was used to compare percent time-in-range from the start of the study to week 4, 12, and study completion. A two-tailed Wilcoxon signed-rank test was used to compare percent time-in-hypoglycemia from the start of the study to week 4, 12, and study completion.

Supplementary Table 6| Top 5 features for each class of recommendations delivered by the K-nearest-neighbors algorithm, as ranked by mutual information criteria calculation.

Recommendation	Top 5 Features
Decrease Basal Insulin	Percent Time-in-Hypoglycemia
	Frequency of Hypoglycemic Events
	Nocturnal Hypoglycemia
	Percent Time-in-Hyperglycemia
	Postprandial Hypoglycemia, Overnight
Increase Basal Insulin	Frequency of Hypoglycemic Events
	Percent Time-in-Hyperglycemia
	Percent Time-in-Hypoglycemia
	Nocturnal Hypoglycemia
	Postprandial Hypoglycemia, Overnight
Increase Meal Bolus Dosed 7AM-11AM	Percent Time-in-Hyperglycemia
	Percent Time-in-Serious-Hyperglycemia
	Postprandial Hyperglycemia, 3PM-8PM
	Percent Time-in-Hypoglycemia
	Postprandial Serious Hyperglycemia, 3PM-8PM
Increase Meal Bolus Dosed 11AM-3PM	Percent Time-in-Hyperglycemia
	Percent Time-in-Serious-Hyperglycemia
	Percent Time-in-Hypoglycemia
	Postprandial Hypoglycemia, 3PM-8PM
	Frequency of Hypoglycemic Events
Increase Meal Bolus Dosed 3PM-8PM	Percent Time-in-Hyperglycemia
	Postprandial Hyperglycemia, 3PM-8PM
	Postprandial Hypoglycemia, Overnight
	Frequency of Hypoglycemic Events
	Percent Time-in-Hypoglycemia
Increase Meal Bolus Dosed Overnight	Percent Time-in-Hyperglycemia
	Percent Time-in-Serious-Hyperglycemia
	Postprandial Serious Hyperglycemia, 3PM-8PM

	Correction Boluses
	Postprandial Serious Hyperglycemia, 3PM-8PM
Decrease Meal Bolus Dosed 7AM-11AM	Postprandial Hypoglycemia, 11AM-3PM
	Postprandial Hypoglycemia, 7AM-11AM
	Frequency of Serious Hypoglycemic Events
	Postprandial Serious Hypoglycemia, 11AM-3PM
	Postprandial Serious Hypoglycemia, 7AM-11AM
Decrease Meal Bolus Dosed 11AM-3PM	Postprandial Hypoglycemia, 3PM-8PM
	Percent Time-in-Hypoglycemia
	Frequency of Hypoglycemic Events
	Frequency of Serious Hypoglycemic Events
	Postprandial Hypoglycemia, 11AM-3PM
Decrease Meal Bolus Dosed 3PM-8PM	Postprandial Serious Hypoglycemia, Overnight
	Postprandial Hypoglycemia, Overnight
	Frequency of Serious Hypoglycemic Events
	Percent Time-in-Hypoglycemia
	Frequency of Hypoglycemic Events
Decrease Meal Bolus Dosed Overnight	Percent Time-in-Hypoglycemia
	Frequency of Hypoglycemic Events
	Nocturnal Hypoglycemia
	Postprandial Hypoglycemia, Overnight
	Frequency of Serious Hypoglycemic Events

The recommendation to decrease basal insulin was most closely related to frequency and duration of hypoglycemia as well as nighttime glycemic excursions. The recommendation to decrease meal bolus aggressiveness was most closely related to the person's postprandial hypoglycemia. The recommendation to increase insulin before meals was most closely related to serious hyperglycemic events and overall daytime glycemic excursions. The relationship of these specific glycemic features with their associated optimal recommendations matches intuition and, in general, is synonymous with physician opinions regarding titration of insulin dosing for people with T1D.

Supplementary Table 7| Glycemic features selected as inputs into the KNN-DSS lookup table.

Feature	Description	Normalization
Frequency of Hypoglycemic events	Overall number of independent hypoglycemic events detected in the users CGM data. Data is converted to a frequency measurement (# hypoglycemic events per # days of data).	Normalized to the expected frequency of hypoglycemic events for people with T1D (1.16 hypoglycemic events per day, a value determined from a separate dataset [30]).
Nocturnal Hypoglycemia	Number of hypoglycemic events detected between 10PM-7AM, normalized to the overall number of independent hypoglycemic events detected in the users CGM data.	‘’
Abnormal Morning Hypoglycemia	Number of abnormal morning hypoglycemic events detected in the user CGM data. Data is normalized to overall number of hypoglycemic events detected in the users CGM data.	‘’
Postprandial Hypoglycemia 7AM – 11AM	Number of hypoglycemic events detected following a meal bolus dosed between 7AM-11AM. Data is then normalized to the overall number of hypoglycemic events detected in the users CGM data.	‘’
Postprandial Hypoglycemia 11AM – 3PM	Number of hypoglycemic events detected following a meal bolus dosed between 11AM – 3 PM. Data is then normalized to the overall number of hypoglycemic events detected in the users CGM data.	‘’
Postprandial Hypoglycemia 3PM – 8PM	Number of hypoglycemic events detected following a meal bolus dosed between 3PM – 8PM. Data is then normalized to the overall number of hypoglycemic events detected in the users CGM data.	‘’
Postprandial Hypoglycemia Overnight	Number of hypoglycemic events detected following a meal bolus dosed between 8PM – 7AM. Data is then normalized to the overall number of hypoglycemic events detected in the users CGM data.	‘’
Correction-Related Hypoglycemia	Number of hypoglycemic events detected following correction boluses dosed. Data is normalized to the overall number of	‘’

	hypoglycemic events detected in the users CGM data.	
Frequency of Serious Hypoglycemic events	Overall number of independent serious hypoglycemic events detected in the users CGM data. Data is converted to a frequency measurement (# serious hypoglycemic events / # days of data).	‘’
Serious Postprandial Hypoglycemia 7AM – 11AM	Number of serious hypoglycemic events detected following a meal bolus dosed between 7AM-11AM. Data is then normalized to the overall number of hypoglycemic events detected in the users CGM data.	‘’
Serious Postprandial Hypoglycemia 11AM – 3PM	Number of serious hypoglycemic events detected following a meal bolus dosed between 11AM-3PM. Data is then normalized to the overall number of hypoglycemic events detected in the users CGM data.	‘’
Serious Postprandial Hypoglycemia 3PM – 8PM	Number of serious hypoglycemic events detected following a meal bolus dosed between 3PM-8PM. Data is then normalized to the overall number of hypoglycemic events detected in the users CGM data.	‘’
Serious Postprandial Hypoglycemia Nighttime	Number of serious hypoglycemic events detected following a meal bolus dosed between 8PM-7AM. Data is then normalized to the overall number of hypoglycemic events detected in the users CGM data.	‘’
Correction-Related Serious Hypoglycemia	Number of serious hypoglycemic events detected following correction boluses dosed. Data is normalized to the overall number of hypoglycemic events detected in the users CGM data.	‘’
Percent Time-in-Hypoglycemia	The percent of time that the users CGM measured less than 70 mg/dL.	N/A
Postprandial Hyperglycemia 3PM-8PM	Number of hyperglycemic events detected following a meal bolus dosed between 3PM-8PM. Data is then normalized to the overall number of hyperglycemic events detected in the users CGM data.	Normalized to the expected frequency of hyperglycemic events for people with T1D (2.05 hyperglycemic events per day, a

		value determined from a separate dataset [30]).
Correction Related Hyper	Number of hyperglycemic events detected following correction boluses dosed. Data is normalized to the overall number of hyperglycemic events detected in the users CGM data.	‘’
Serious Postprandial Hyper 7AM – 11AM	Number of serious hyperglycemic events detected following a meal bolus dosed between 7AM-11AM. Data is then normalized to the overall number of hyperglycemic events detected in the users CGM data.	‘’
Serious Postprandial Hyper 11AM – 3PM	Number of serious hyperglycemic events detected following a meal bolus dosed between 11AM-3PM. Data is then normalized to the overall number of hyperglycemic events detected in the users CGM data.	‘’
Serious Postprandial Hyper 3PM – 8PM	Number of serious hyperglycemic events detected following a meal bolus dosed between 3PM-8PM. Data is then normalized to the overall number of hyperglycemic events detected in the users CGM data.	‘’
Serious Postprandial Hyper Overnight	Number of serious hyperglycemic events detected following a meal bolus dosed between 8PM-7AM. Data is then normalized to the overall number of hyperglycemic events detected in the users CGM data.	‘’
Correction Related Serious Hyperglycemia	Number of serious hyperglycemic events detected following correction boluses dosed. Data is normalized to the overall number of hyperglycemic events detected in the users CGM data.	‘’
Percent Time in Hyperglycemia	The percent of time that the users CGM measured greater than 180 mg/dL	N/A
Percent Time in Serious Hyperglycemia	The percent of time that the users CGM measured greater than 300 mg/dL	N/A

Correction Boluses	Number of detected correction boluses dosed.	Normalized to the expected maximum number of correction boluses based on treatment recommendations (8 doses per 24hr period if users dosed once / three hours)

Hypoglycemia is defined as measured glucose < 70 mg dL^-1, serious hypoglycemia is defined as measured glucose < 54 mg dL^-1, hyperglycemia is defined as glucose > 180 mg dL^-1, and serious hyperglycemia is defined as glucose > 300 mg dL^-1. To count an individual hypoglycemic or hyperglycemic event, measured glucose must be within the specified range and preceded by 20 continuous minutes of euglycemia; this hysteresis approach is used to prevent over-counting glycemic events that occurred due to CGM measurement noise.

Supplementary Table 8 | Look-up table class representation.

Recommendation	Count	Percent
Increase Basal	3723	7.18%
Decrease Basal	12041	23.23%
Increase AM Bolus	2574	4.97%
Increase PM Bolus	2549	4.92%
Increase Evening Bolus	3185	6.14%
Increase Overnight Bolus	1046	2.02%
Decrease AM Bolus	3744	7.22%
Decrease PM Bolus	4678	9.03%
Decrease Evening Bolus	7064	13.63%
Decrease Overnight Bolus	1565	3.02%
No Adjustment Recommended	9662	18.64%

Supplementary Table 9 | Classification accuracy for weighting schemes.

K-nearest-neighbors classification weighting	% Classification Accuracy
No weighting imposed	0.6886
Class and distance-based weighting	0.7385
Distance-based weighting	0.7221
Class-based weighting	0.6864

Supplementary Table 10| Criteria used for labeling a recommendation from the KNN-DSS as in full agreement, partial agreement, full disagreement, or partial disagreement with a physician.

KNN-DSS Recommendation	**Physician Recommendation**			
	Full Agreement	***Partial Agreement***	***Full Disagreement***	***Partial Disagreement***
Increase Basal Insulin	Increase Basal Insulin	Increase short-acting insulin doses for meals or corrections	Decrease basal insulin	Decrease short-acting insulin doses for meals or corrections
Decrease Basal Insulin	Decrease basal insulin	Decrease short-acting insulin doses for meals or corrections	Increase Basal Insulin	Increase short-acting insulin doses for meals or corrections
Increase Meal Insulin, AM	Increase meal insulin AM	Increase meal or correction insulin (in adjacent time windows overnight and afternoon) Increase basal insulin Adhere to bolus calculator or basal dosage.	Decrease meal insulin AM.	Decrease meal or correction insulin (in adjacent time windows overnight and afternoon) Increase or decrease meal or correction insulin (non-adjacent time window evening) Decrease basal insulin
Increase Meal Insulin, Afternoon	Increase meal insulin afternoon	Increase meal or correction insulin (in adjacent time windows AM and evening) Increase basal insulin Adhere to bolus calculator or basal dosage	Decrease meal insulin afternoon.	Decrease meal or correction insulin (in adjacent time windows AM and evening) Increase or decrease meal or correction insulin (non-adjacent time window overnight) Decrease basal insulin
Increase Meal Insulin, Evening	Increase meal insulin evening	Increase meal or correction insulin (in adjacent time windows afternoon and overnight) Increase basal insulin Adhere to bolus calculator or basal dosage.	Decrease meal insulin evening	Decrease meal or correction insulin (in adjacent time windows afternoon and overnight) Increase or decrease meal or correction insulin (non-adjacent time window AM) Decrease basal insulin
Increase Meal Insulin, Overnight	Increase meal insulin overnight	Increase meal or correction insulin (in adjacent time windows evening and AM) Increase basal insulin	Decrease meal insulin overnight	Decrease meal or correction insulin (in adjacent time windows evening and AM) Increase or decrease meal or correction

		Adhere to bolus calculator or basal dosage		insulin (non-adjacent time window afternoon) Decrease basal insulin
Decrease Meal Insulin, AM	Decrease meal insulin AM	Decrease meal or correction insulin (in adjacent time windows overnight and afternoon) Decrease basal insulin Adhere to bolus calculator or basal dosage	Increase meal insulin AM Partial disagreement	Increase meal or correction insulin (in adjacent time windows overnight and afternoon) Increase or decrease meal or correction insulin (non-adjacent time window evening) Increase basal insulin
Decrease Meal Insulin, Afternoon	Decrease meal insulin afternoon	Decrease meal or correction insulin (in adjacent time windows AM and evening) Decrease basal insulin Adhere to bolus calculator or basal dosage	Increase meal insulin afternoon	Increase meal or correction insulin (in adjacent time windows AM and evening) Increase or decrease meal or correction insulin (non-adjacent time window overnight) Increase basal insulin
Decrease Meal Insulin, Evening	Decrease meal insulin evening	Decrease meal or correction insulin (in adjacent time windows afternoon and overnight) Decrease basal insulin Adhere to bolus calculator or basal dosage	Increase meal insulin evening	Increase meal or correction insulin (in adjacent time windows afternoon and overnight) Increase or decrease meal or correction insulin (non-adjacent time window AM) Increase basal insulin
Decrease Meal Insulin, Overnight	Decrease meal insulin overnight	Decrease meal or correction insulin (in adjacent time windows evening and AM) Decrease basal insulin Adhere to bolus calculator or basal dosage	Increase meal insulin overnight	Increase meal or correction insulin (in adjacent time windows evening and AM) Increase or decrease meal or correction insulin (non-adjacent time window afternoon) Increase basal insulin
Increase Correction Insulin, AM	Increase correction insulin AM	Increase meal or correction insulin (in adjacent time windows overnight and afternoon) Increase basal insulin Adhere to bolus calculator or basal dosage	Decrease correction insulin AM	Decrease meal or correction insulin (in adjacent time windows overnight and afternoon) Increase or decrease meal or correction insulin (non-adjacent time window evening)

				Decrease basal insulin
Increase Correction Insulin, Afternoon	Increase correction insulin afternoon	Increase meal or correction insulin (in adjacent time windows AM and evening) Increase basal insulin Adhere to bolus calculator or basal dosage	Decrease correction insulin afternoon	Decrease meal or correction insulin (in adjacent time windows AM and evening) Increase or decrease meal or correction insulin (non-adjacent time window overnight) Decrease basal insulin
Increase Correction Insulin, Evening	Increase correction insulin evening	Increase meal or correction insulin (in adjacent time windows afternoon and overnight) Increase basal insulin Adhere to bolus calculator or basal dosage	Decrease correction insulin evening	Decrease meal or correction insulin (in adjacent time windows afternoon and overnight) Increase or decrease meal or correction insulin (non-adjacent time window AM) Decrease basal insulin
Increase Correction Insulin, Overnight	Increase correction insulin overnight	Increase meal or correction insulin (in adjacent time windows evening and AM) Increase basal insulin Adhere to bolus calculator or basal dosage	Decrease correction insulin overnight	Decrease meal or correction insulin (in adjacent time windows evening and AM) Increase or decrease meal or correction insulin (non-adjacent time window afternoon) Decrease basal insulin
Decrease Correction Insulin, AM	Decrease correction insulin AM	Decrease meal or correction insulin (in adjacent time windows overnight and afternoon) Decrease basal insulin Adhere to bolus calculator or basal dosage	Increase correction insulin AM	Increase meal or correction insulin (in adjacent time windows overnight and afternoon) Increase or decrease meal or correction insulin (non-adjacent time window evening) Increase basal insulin
Decrease Correction Insulin, Afternoon	Decrease correction insulin afternoon	Decrease meal or correction insulin (in adjacent time windows AM and evening) Decrease basal insulin Adhere to bolus calculator or basal dosage	Increase correction insulin afternoon	Increase meal or correction insulin (in adjacent time windows AM and evening) Increase or decrease meal or correction insulin (non-adjacent time window overnight) Increase basal insulin

Decrease Correction Insulin, Evening	Decrease correction insulin evening	Decrease meal or correction insulin (in adjacent time windows afternoon and overnight) Decrease basal insulin Adhere to bolus calculator or basal dosage	Increase correction insulin evening	Increase meal or correction insulin (in adjacent time windows afternoon and overnight) Increase or decrease meal or correction insulin (non-adjacent time window AM) Increase basal insulin
Decrease Correction Insulin, Overnight	Decrease correction insulin overnight	Decrease meal or correction insulin (in adjacent time windows evening and AM) Decrease basal insulin Adhere to bolus calculator or basal dosage	Increase correction insulin overnight	Increase meal or correction insulin (in adjacent time windows evening and AM) Increase or decrease meal or correction insulin (non-adjacent time window afternoon) Increase basal insulin
No change to settings	No change to settings	N/A	N/A	N/A
Use bolus calculator	Use the bolus calculator	Modify short-acting bolus	N/A	N/A
Adhere to basal insulin dosage	Adhere to basal insulin dosage	Modify basal dosage	N/A	N/A

Additional: No change to settings indicated. As an example, for each unique recommendation delivered by Party A, we define subsets of recommendations corresponding to the categories *perfect agreement, partial agreement, disagreement, and partial disagreement*. We then calculate the similarity between these subsets and the recommendations delivered by Party B. This determines the agreement between Party A and Party B with respect to perfect agreement, partial agreement, disagreement, and partial disagreement.