

Supplementary Material

Supplementary Table 1: Annotation details.

Annotator	Number of logs for which corrected timing was identified	Number of manual timings added
1	1154	601
2	1078	630
3	1064	444
4	1356	398

Supplementary Table 2: Covariate balance achieved between elevated meal event count and covariates after inverse probability weighting.

Balance measures between elevated meal event count and covariates	Type of Variable	Maximum standardized mean difference across all pairwise comparisons	
		Before inverse probability weighting	After inverse probability weighting
Baseline glucose	Continuous	0.57	0.41
Step counts	Continuous	0.32	0.25
Duration	Continuous	0.39	0.11

Supplementary Table 3: Output of linear mixed effects model to estimate effect of elevated meal event count on time-in-range (54-140 mg/dL).

		Estimate	Standard Error	P-value (t-test)
Intercept		99.4	6.7	<0.0001
Elevated meal event count	0 to 1	-1.1	1.3	0.41
	0 to 2	-4.0	1.3	0.003
	0 to ≥ 3	-8.1	1.5	<0.0001

Daily step counts	-0.2	0.2	0.30
Baseline glucose	-0.3	0.02	<0.0001
Duration	0.6	0.3	0.03

Supplementary Table 4: Output of linear mixed effects model to estimate effect of elevated meal event count on average glucose.

		Estimate	Standard Error	P-value (t-test)
Intercept		92.5	7.6	<0.0001
Elevated meal event count	0 to 1	1.7	1.2	0.16
	0 to 2	5.8	1.3	<0.0001
	0 to ≥ 3	7.7	1.4	<0.0001
Step counts		-0.3	0.2	0.08
Baseline glucose		0.3	0.02	<0.0001
Duration		-0.5	0.3	0.05

Supplementary Table 5: Covariate balance achieved between daily step counts and covariates after inverse probability weighting.

Balance measures between step counts and covariates		Type of Variable	Correlation	
			Before inverse probability weighting	After inverse probability weighting
Baseline glucose		Continuous	-0.19	-0.18
Elevated meal event count	0	Binary	0.08	0.03
	1	Binary	-0.08	-0.05

	2	Binary	0.02	0.03
	3	Binary	-0.02	-0.0
Duration		Continuous	0.15	0.09

Supplementary Table 6: Output of linear mixed effects model to estimate effect of daily step count on time-in-range (54-140 mg/dL).

Fixed effects		Estimate	Standard Error	P-value (t-test)
Intercept		100.0	6.5	<0.0001
Step counts		0.07	0.1	0.63
Elevated meal event count	0 to 1	-1.3	1.5	0.40
	0 to 2	-3.8	1.5	0.01
	0 to ≥ 3	-7.7	1.9	<0.0001
Baseline glucose		-0.3	0.02	<0.0001
Duration		0.4	0.3	0.13

Supplementary Table 7: Output of linear mixed effects model to estimate effect of daily step count on average glucose.

Fixed effects		Estimate	Standard Error	P-value (t-test)
Intercept		91.8	7.8	<0.0001
Step counts		-0.3	0.1	0.02
Elevated meal event count	0 to 1	2.5	1.4	0.08
	0 to 2	5.7	1.4	<0.0001

	0 to ≥ 3	7.6	1.7	<0.0001
Baseline glucose		0.3	0.02	<0.0001
Duration		-0.4	0.2	0.09

Supplementary Table 8: Output of linear mixed effects model to estimate effect of post-meal step count on meal event glucose response.

Fixed effects	Estimate	Standard Error	P-value (t-test)
Intercept	4755.0	436.1	<0.0001
Post-meal step count	-640.6	185.4	0.0006
Calorie content	182.8	33.0	<0.0001

Supplementary Table 9: Output of linear mixed effects model to estimate effect of post-meal step count on elevated classification of meal event.

Fixed effects	Estimate	Standard Error	P-value (t-test)
Intercept	-0.2	0.2	0.43
Post-meal step count	-0.8	0.2	<0.0001
Calorie content	0.08	0.03	0.002

Supplementary Table 10: Occupation information of the participants.

Occupation	Number of participants
Promoter	3
Counselor	1

Substitute teacher	1
Retired	2
Student	1
Deli	1
Records technician	1
Cleaning service	1
Housewife	2
Gardener	1
Service Counter Representative (Bank)	1
Housekeeping	9
Housemaid	1
Nurse	1
Housewife/student	1
Customer service	1
Cook	2
Cashier	1
None	1
Guest representative	1
Clerk	1
Engineer	1
Full service	1

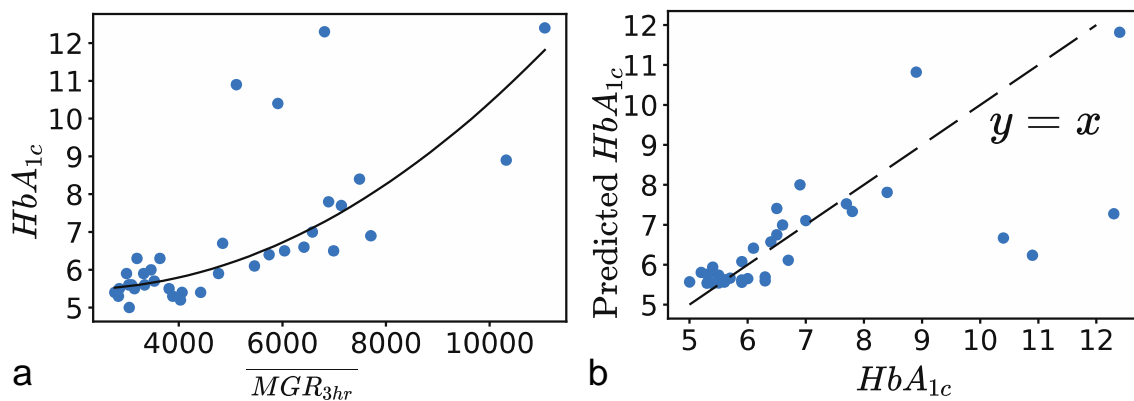
Supplementary Table 11: Main results obtained with quadratic term fit between average meal event glucose response and HbA1c. Effect of daily step count and elevated meal event count on time-in-range (54-140 mg/dL) and average glucose. Effect of post-meal step count and calorie content on meal event glucose response and elevated classification of meal event.

Outcome		Time-in-range (54-140 mg/dL) Percentage of total time (%)			Average glucose mg/dL		
		Estimate	Standard Error	P-value (t-test)	Estimate	Standard Error	P-value (t-test)
Elevated meal event count	0 to 1	-0.4	1.3	0.7	1.4	1.2	0.26
	0 to 2	-4.0	1.3	0.003	5.8	1.3	<0.0001

	0 to ≥ 3	-6.9	1.5	<0.0001	7.3	1.5	<0.0001
Daily step count (1 unit = 1000 steps)		0.08	0.2	0.58	-0.4	0.1	0.009
Outcome		Meal event glucose response			Elevated classification of meal event		
Variable of interest		Estimate	Standard Error	P-value (t-test)	Estimate	Standard Error	P-value (t-test)
Post-meal step count (1 unit = 1000 steps)		-640.0	185.4	0.0006	-0.8	0.2	<0.0001
Calorie content (1 unit = 100 kcal)		182	34.0	<0.0001	0.1	0.03	0.0005

Supplementary Table 12: Effect of elevated meal event count on time-in-range (70-140 mg/dL).

Outcome		Time-in-range (70-140 mg/dL) Percentage of total time (%)		
Variable of interest		Estimate	Standard Error	P-value (t-test)
Elevated meal event count	0 to 1	-1.4	1.4	0.35
	0 to 2	-4.4	1.5	0.003
	0 to ≥ 3	-8.4	1.6	<0.0001



Supplementary Figure 1: Quadratic term mapping between average meal event glucose response and HbA_{1c}. The scatterplot (a) displays the robust regression fit between average meal event glucose response and HbA_{1c}. The

equation representing the best line-of-fit is reported (solid black line). The scatterplot in (b) shows the correlation between true and fitted HbA_{1c} values. The dashed black line represents the 45-degree line.