

Background

There is a strong interest for self-insured employers, at-risk providers, and payers to empower people with diabetes through novel technology to improve self-management and decrease costs.^{1,2} Given the limited resources of certified diabetes educators, endocrinologists, and primary care doctors, exploring how to leverage technology in identifying and delivering personalized effective interventions holds great promise. The Livongo for Diabetes, program offers: (1) a cellular enabled blood glucose meter with real time personalized analytics delivered back to an individual through the meter, email, or text, (2) Unlimited test strips and (3) Access to CDE coaches. Members currently using Livongo for Diabetes include employees and dependents from self-insured companies, people insured directly through health insurance plans, and patients taken care of by providers who are in risk sharing models.



Figure 1. Overview of Livongo for Diabetes Program

Objective

To compare blood glucose control in people using a cellular enabled blood glucose meter with real-time, personalized, actionable recommendations provided by Livongo Health before and after they have had a telephonic coaching session with a certified diabetes educator.

Methods

Scheduled coaching is offered to individuals through texts, email, or the meter but are member-initiated. These coaching sessions focus on the AADE 7 self-care behaviors and are personalized to each member based on their specific blood glucose patterns. Coaching Alert contacts occur with extreme BG excursions - > 400 mg/dL and < 50 mg/dL or at BG values selected by member.

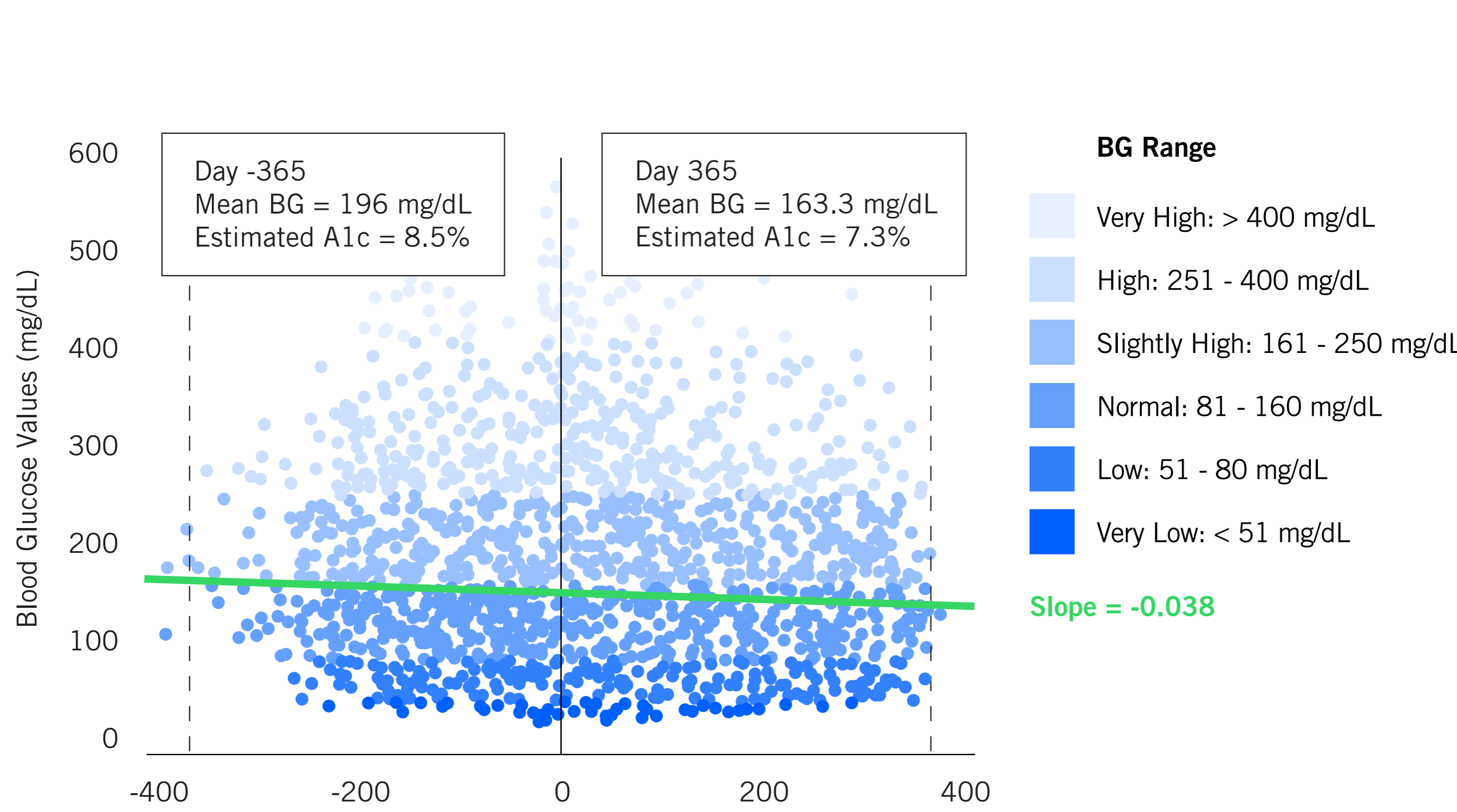
We studied 10,741 members from the time of initiation with the program for each member through March 2016. Demographic characteristics including age, gender, diabetes type and insulin use were compared between members who received coaching contact and those who did not. Mean blood glucose was calculated 365 days prior to coaching session and 365 days after coaching sessions. HbA1c was estimated by a formula based on mean BG before and after coaching contact.³

Results

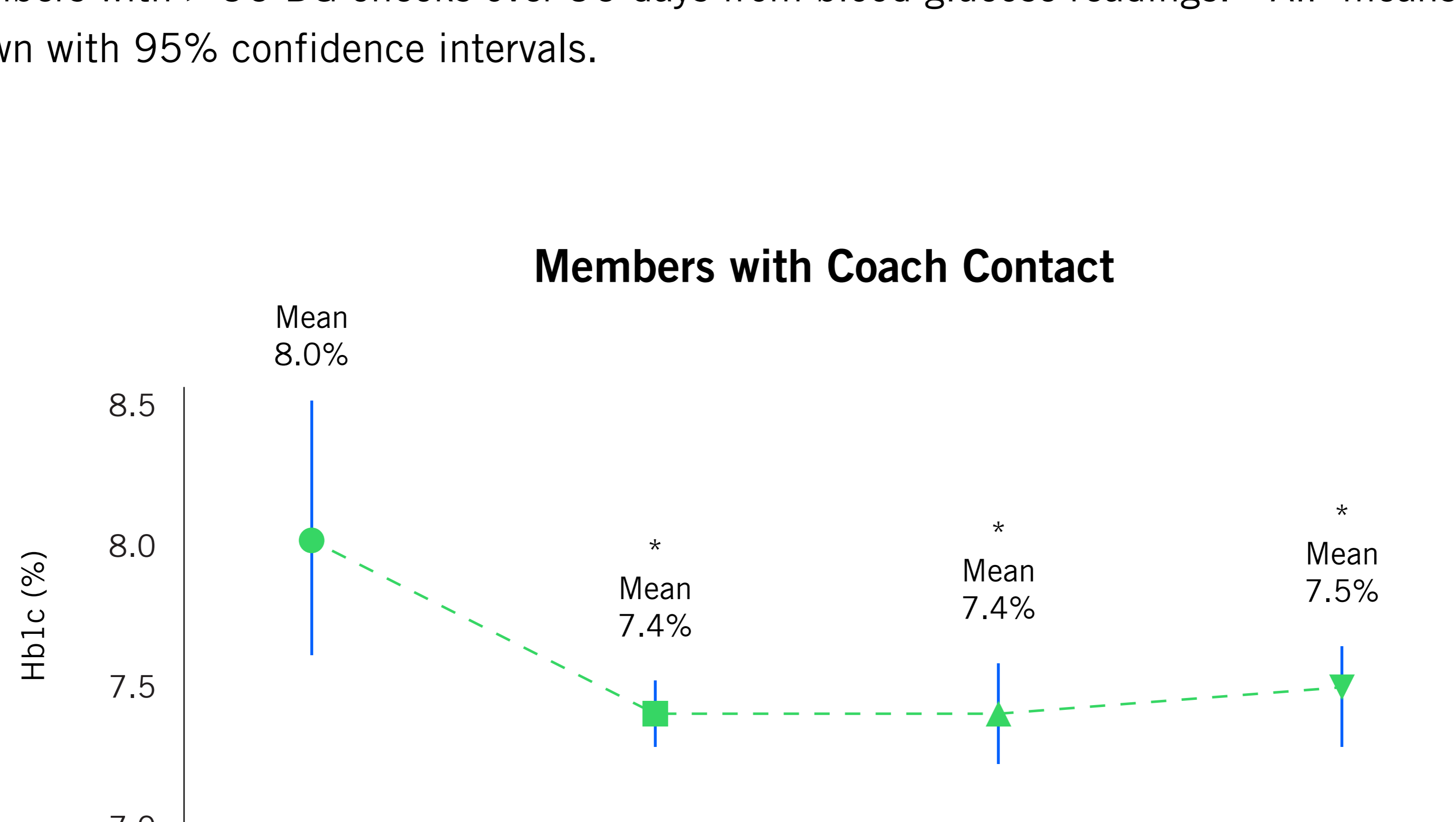
- Members who received coaching were more likely to be female, have type 1 diabetes (particularly coaching alert calls) and use insulin.

	Scheduled Coaching	Coach Alerts	No Coach Contact	Total	Any Coach vs. No Coach p-value
n	401	2,228	8,356	10,741	-
Age (mean)	53	50	53	52	0.260
% Male	40%	48%	51%	50%	0.002
% Type 2	88%	73%	89%	86%	<0.001
% Use Insulin	43%	61%	31%	37%	<0.001

- Prior to coaching, the mean blood glucose was 196 mg/dL for members who received coaching. After members had received their first personalized coaching session, mean blood glucose decreased by 33 mg/dL.



- Members who received coaching had a sustained reduction in calculated HbA1c compared to self-reported HbA1c at registration. Self-reported mean HbA1c at registration was 8.0% which fell to 7.4% for members with any kind of coaching contact (**p<0.01**). This lower HbA1c is sustained through 9 months thus far. Mean values at Days 90, 180 and 270 are calculated for members with > 90 BG checks over 90 days from blood glucose readings.³ All means are shown with 95% confidence intervals.



Conclusions

- Female members who are type 1 and/or use insulin are more likely than males with type 2 diabetes to seek coaching.
- CDE coach contact combined with cellular-enabled blood glucose device improved blood glucose control
- HbA1c for members using the coaching feature of Livongo program improved from 7.5 to 7.0% after 3 months of program participation.
- This HbA1c improvement was sustained up to 6 months.

Limitations & Future Work

- Efficacy of the coaching session could be best validated with lab HbA1c before and after coaching
- Extended member time with Livongo Diabetes program will allow exploration of potential for reducing long-term complications.
- Cost-savings associated with medical claims or modelled by HbA1c reduction related to coaching

References

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- Nathan DM, Kuenen J, Borg R, et al. Translating the A1C Assay Into Estimated Average Glucose Values. *Diabetes Care*. 2008;31(8):1473-1478.