Cost and Outcomes of a Diabetes Remote Patient Monitoring System: A Simulation Analysis

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BACKGROUND & STUDY AIM

Background

- Digital health can assist persons with diabetes (PWD) with better disease management
- Scant research exists on whether remote patient monitoring (RPM) supported by digital therapeutics (RPM+DT) impact long-term Type 2 diabetes (T2D) outcomes and costs
- Glooko is a connected care RPM program connecting providers and patients for comprehensive diabetes care

Aim

- A mathematical simulation model was used to estimate the impact of a RPM+DT technology on diabetes outcomes, health care resource use, and costs

MICROSIMULATION MODELING

- Simulates changes in individual characteristics over time using known probabilities and allows prediction based on the impact of an intervention
- A faster and less expensive option than conducting an independent health economics outcomes research (HEOR) study

HEOR Model T2D Data Sources

- UK Prospective Diabetes Study Outcomes Model 2 (OM2)
- Glooko RPM clinical trial data
- National Health and Nutrition Examination Survey (NHANES)

HEOR Model Parameters

- 3- and 5-yr, lifetime scenario analyses
- 3% discount rate
- Cost of RPM not included

METHODS

- **Step 1:** Individual Patient Simulation
  - Patients with T2D data from NHANES to populate the model (n=745)
- **Step 2:** Event Microsimulation
  - OM2 risk equations estimated longitudinal disease trajectory
  - Increases in HbA1c and weight, hypoglycemia incidence, and insulin treatment were accounted for in the model
  - All event and/or mortality associated costs were applied
- **Step 3:** Glooko Clinical Trial Data
  - Hazard ratios from the Glooko RCT estimated the incidence of clinical events and mortality in each year until the simulated patient "died"
- **Step 4:** Calculation of Mean Results
  - Differences between Glooko RPM and Standard of Care for micro- and macrovascular outcomes (clinical events) and costs were estimated
  - One-way and probabilistic sensitivity analyses to estimate 95% credible ranges were conducted

RESULTS

- Clinical events (**Table 1**) and Costs (**Table 2**) decreased over time with RPM
- Disease related costs savings across all time horizons (**Table 3**)

Table 1

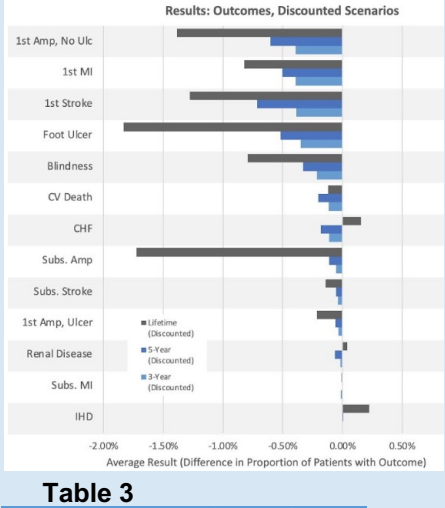

Table 2

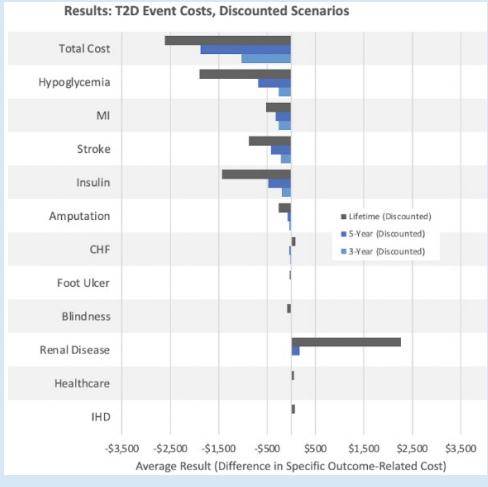

Table 3

	3-Year	5-Year	Lifetime
IHD	$0	$5	$79
Healthcare	-$2	-$2	$49
Renal Disease	-$5	$174	$2,270
Blindness	-$7	-$16	-$83
Foot Ulcer	-$8	-$12	-$35
CHF	-$28	$44	$87
Amputation	-$48	-$76	-$267
Insulin	-$191	-$480	-$1,430
Stroke	-$221	-$423	-$883
MI	-$258	-$321	-$524
Hypoglycemia	-$263	-$682	-$1,902
Total Cost	**-$1,030**	**-$1,875**	**-$2,612**

CONCLUSIONS

- In a RCT of RPM+DT, the intervention resulted in significantly improved HbA1c. Incorporating these results into a microsimulation model of longer-term complications, mortality, and costs demonstrated the potential for RPM+DT to elicit health gains and cost savings among PWD.

Abstract #LI2022-0169 **No conflicts to report**

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