Patient-Focused Wireless Messages for Diabetes
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Background
Diabetes is a serious medical condition, in which complications can be reduced by aggressive glycemic control (1,2). Adherence to the diabetes care plan can be improved through monitoring with continual adjustments. Monitoring and management support tools are cost-effective, in one study saving $27,000 per patient, with an average HbA1c decrease of 1.7% (3).

Methods
Clinical scenarios where patients would benefit from messages were discerned from interviews with a diabetes care team. Automated messages were sent to patients in a pilot study, with three month follow-up phone calls.

Results
Nine scenarios were found where clinical messages might improve diabetes management. Appointment Reminders. Appointments, pre-visit lab draws, and preventative health tasks (quarterly diabetes visits, yearly ophthalmological referral) were often forgotten. Medication Reminders. Patients desire reminders for medication refills, and for taking medicines at certain times of the day. Medication Dosage Changes. Patients benefit from follow up on medicine changes, as they may become noncompliant and not tell the team. Medication Dosage Clarification. Patients sometimes misdose due to communication errors (e.g. “once a day” interpreted as 11 tablets a day) or space medication doses improperly. Blood Glucose Testing Reinforcement. Patients forget agreements with their provider to check their blood sugar at certain times of the day. Meal Time Reinforcement. Some patients have difficulty remembering meal and snack times. Exercise Reinforcement. Patients desire reminders up to twice a day to make time for the activities they enjoy (walks, Tai Chi, etc). Dietary Reinforcement. Some patients desire reinforcement to eat less, to decrease soft drink and/or juice consumption, to eat healthier, or to drink more water. General Information. Patients desire timely access to health care information, including lab results, medication recalls, preventative health information (influenza vaccination reminders), and availability of new medications/devices for diabetes management.

Discussion
Patients in the pilot study enjoyed receiving messages. We learned that: Messages should be coalesced if temporally close. Patients preferred a single message for all tasks to be performed within a 30 minute block. Communications should be customized. Patients do not need reminders for what they already do. Monitoring patient responses is important. The system should be able to identify critical responses, so that actions can be taken quickly. Constant reminders train patients. Patients start predicting when the pages will come, and they remember what they need to do. Wireless technology is not ubiquitous. This intervention can only be used where wireless service is provided reliably. Reliability is important. Patients noticed missed messages, and failures despite reason (software issues, network freezes, patients out of service area) reflected upon the messaging system.

Conclusions
We have identified nine clinical scenarios, acceptable to patients, where wireless messages can support their diabetes care plan. A system that sends messages and records patient responses can be used to assist health care teams in chronic disease management for diabetes. This system may be useful for other chronic patient monitoring (pain score, urine dip, mood).

Acknowledgements
This research has been supported by the American Diabetes Association, the Warren G. Magnuson Institute for Biomedical Research and Health Professional Training, and Alpha Omega Alpha. Michael architected the messaging system, and he could profit if it is adopted in the future. Thanks to our families for their support.

References