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Using Telemedicine and Wireless Technology To Improve Diabetic Outcomes In Poorly Controlled Patients

There are over 16 million diabetics in the United States today. Diabetes is particularly difficult to control because frequent fluctuations in blood glucose – a natural result from variations in diet, physical activity, and stress, etc. – demand periodic adjustments in insulin and/or other diabetic medications. The clinical marker of effective diabetes therapy is given by the measure of Hemoglobin A_1C levels, a reflection of blood glucose averages over a three -month period.

An effective diabetes management strategy, as indicated by the Diabetes Control and Complications Trial (DCCT), maintains blood glucose levels as close to the normal range as is safely possible. This study will demonstrate the effectiveness of telemedicine and wireless technologies in improving the disease management techniques of poorly controlled adult diabetics – techniques that ultimately lead to stabilized blood glucose measures and reduced complications.

We propose using telemedicine and wireless technology to frequently monitor blood glucose levels, make daily therapeutic adjustments, and assess these effects upon hemoglobin A_1C levels.

Patients will use one of three modalities to securely transfer blood glucose data to an Internet web site. The first modality will use a non-web-based transfer of glucose data via a modem to an Internet web site. The two remaining modalities will transfer blood glucose data over the Internet to an Internet web site allowing for direct interaction between the patient and the health care provider.

These methods will encourage the poorly controlled diabetic to embrace state-of-the-art disease management techniques and to become an active and responsible participant in self-care. We believe this new responsibility will enable the patient to achieve improved plan-of-care compliance, disease understanding, health care satisfaction, and clinical outcomes. Diabetics will record and clinicians will monitor daily blood glucose levels, diet, and physical activity. Clinical responses are specific to current conditions and include menu suggestions and medication adjustments.

We will study the feasibility of this technology on 300 poorly controlled diabetics selected from the Diabetes Institute at the Walter Reed Health Care System. Diabetics are randomly assigned to one of three technology groups or a standard care group. Patients are to be studied for 6 months. Patient compliance, hemoglobin A_1C's, the number of major and minor hypoglycemic episodes, emergency room visits, hospital admissions, and the development of new diabetic complications will be statistically analyzed for each group.

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