

Monitoring, But This Time Right Direction! Seeding Collaborative Interdisciplinary Team in Diabetes, Metabolic Syndrome and Technology

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To date, diabetes mellitus and metabolic syndrome one of the most important health care issues which burn millions of patients and budgets in worldwide. Using wireless device for measuring blood glucose idea is getting very impressive technology which would help with day to day management of diabetes. With automatically transmitted data obtained from patients to health care professionals easier to select patient's not taking correct insulin dose or hypoglycemic agents on time. Many doctors in outpatient clinics complain about "not to obtain recent correct blood glucose data" for their final decisions. Recording and monitoring blood sugars from diabetics and metabolic syndrome are critical for streamline fluctuations, on the other hand, are not always available especially for children and live alone seniors.

Accurate blood glucose measurements at a single point in time with finger stick glucose meters or continuous glucose monitoring for adjustment their treatment "time to time" necessary to maintain their effective therapy. A major issue in this circle is to provide close communications with patients, their parents, caregivers and health care professionals in their busy life style (Figure 1). Especially, diagnosis of sudden hypoglycemia or hyperglycemia attack is on time sometimes lifesaving strategy for their management of diabetes and metabolic syndrome. But, how practical and realistic recording and monitoring necessary information from patients in right direction especially high risk group such as type 1 diabetic children and diabetic seniors if we think that still no radical therapy for the disease and related complications.

It is still logistical problem to maintain blood glucose level "24 hour" border line or idealistically normal without fluctuations in regular offering diabetes regime and daily base in their routine activity. More strict blood glucose levels directly dependent strict life quality, however, less feasible for type 1 diabetes mellitus. The balance between treatment and quality of their life is still hard to cope without integrating state of art technologies. Most important highlighted issues are;



Figure 1: Seeding Collaborative Interdisciplinary Team in Diabetes, Metabolic Syndrome and Technology.



Figure 2: Automatically calculate next insulin dose, calorie intake, energy consumption based on latest blood sugar numbers.

- Continuous blood glucose monitoring includes every meal or just before insulin injections or their treatments. Patients sometimes fail to collect their information and bring them to their doctor appointments. It is easy to understand this is hindering of their quality of life.
- How parent continuously monitor their diabetic child at school or seniors live alone at home or nursing home? Diabetic patient's parents are also other dark side of the circle. How we can help that patient and their families integrating with recent available wirelessly transmitted technology?
- To adjust insulin dose in emergency situations such as hypo or hyperglycemia and diabetic coma on time and daily base without visiting doctors. If patients have insulin pumps, is there any possibility adjust insulin dose automatically using software which directly connect to data collection center and health care professionals without destruct their daily life style.
- To adjust calorie intake and activity time to time in daily base.

This is still not logical to reach doctor 24 hour a day to solve all these problems in their routine life style. Is there any way we can design software which automatically calculate next insulin dose, calorie intake, energy consumption based on the latest blood sugar numbers (Figure

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2)? Bluetooth, Zigbee and Palo wireless smart ready products (phones, tablets, PCs, or TVs); traditional or super energy efficient versions are already in use monitoring heart rate, blood pressure and weight scale [1-3]. Integrating wireless communication to health monitoring devices is one of the key components transferring data between patients, their families and doctors. The main components of health monitoring devices can be glucometer or insulin pump for type1 diabetic patients [4]. Sensor devices and data aggregators would be help to transfer all the information to data store center. When the data obtained from patients, they can transfer using with cell phones, computers, portable media players, tablets, smart TV consoles and smart watches oriented data aggregator supported systems to long haul communication networks (Figure 1).

The other important handicap for type 1 diabetic patients is to inject right insulin on time, with necessary dose includes different activity schedule, disease state and different calorie consumption. If we design the software which automatically calculate insulin dose for different calorie intake and energy consumption for each patient (different body weight and blood sugar) for every time after obtain their blood sugar would be more informative and helpful. May be this wireless communication systems should be two way; one way is obtain their blood sugar time to time and the return way is send them back information related their next insulin dose, calorie intake and activity schedule. Especially acute diabetic coma and hypoglycemia attack require emergency treatment and hospitalization. Importantly high risk group of diabetic patients always require their close family contact and communications. With automatically wireless transmitted data to their

families certainly make things easier and manageable.

Recent years, medicine is getting irreversible relationship with technology; looks like bind to each other to make things more realistic and feasible. Especially coping with chronic diseases such as diabetes mellitus and metabolic syndrome are heavy handle health care problem with management as well as budget. When we continue to do research to find out best treatment future modalities for ultimate solution of chronic diseases we have to integrate interdisciplinary technology group sooner or later.

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