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Speaker: Dr. Cesar C. Palerm
Medtronic Diabetes

Title: Diabetes and technology: Managing a complex disease.

Date: Friday – February 1, 2008

Time: 11:00 AM

Place: 552 Hill Center

Abstract

People with type 1 diabetes must frequently adjust their insulin dosing in order to maintain glucose levels as close to normal as possible. This represents a daily challenge, as many different forces influence glycemia, such as diet and meal composition, exercise and its intensity level, hormonal fluctuations, as well as stress, be it physical or psychological.

Technology has significantly improved the quality, and length, of life for those individuals with type 1 diabetes. Starting with the discovery and purification of insulin, on to home blood glucose meters, to designer insulins, subcutaneous infusion pumps, and more recently continuous glucose meters, each technology has had its impact. Nonetheless, these patients remain at increased risk for cardiovascular disease, increased morbidity and mortality when critically ill, and many other undesirable outcomes.

The holy grail has been the development of an artificial pancreatic β -cell, a fully automated closed-loop system which will use the signal from a continuous glucose sensor to adjust insulin infusion rates in real-time. Although significant progress has been made, many hurdles remain.

This talk will give an overview of type 1 diabetes and the challenges in managing glucose levels. As appropriate, the evolution of technology will be traced, with a special focus on the development of an artificial pancreatic β -cell. Results that illustrate the current state-of-the-art will be presented, and the remaining challenges will be outlined.

Biosketch

Dr. Cesar C. Palerm

Dr. Palerm is a Principal Scientist at Medtronic Diabetes, where his research focuses on the development of control algorithms for an artificial β -cell for type 1 diabetes, as well as for the management of stress hyperglycaemia in the hospital setting.

Dr. Palerm's focus has been on algorithm development for type 1 diabetes applications since 2003, and medical applications in general since 1991. Dr. Palerm's Ph.D. research focused on the automatic regulation of blood pressure and cardiac output. From October 2004 through August 2007, Dr. Palerm was a Postdoctoral Research Fellow at the University of California Santa Barbara and guest investigator at Sansum Diabetes Research Institute.

In the area of closed-loop controllers for diabetes, he has worked with renowned academic leaders in the field, including Prof. B. Wayne Bequette, Prof. Francis J. Doyle III, and Prof. Dale E. Seborg, and has collaborated with leading physicians including Dr. Lois Jovanovic (FACE; Chief Scientific Officer and Chief Executive Officer, Sansum Diabetes Research Institute), Dr. Bruce Buckingham (Pediatrics-Endocrinology, Stanford Medical Center), Dr. Howard Zisser (Director for Clinical Research, Sansum Diabetes Research Institute) and Dr. James Desemone (FACE; Director, Goodman Diabetes Service, Albany Medical Center).