## **Bringing the Artificial Pancreas Home: Telemedicine Aspects**

Giordano Lanzola, Ph.D.,<sup>1</sup> Davide Capozzi, Ph.D.,<sup>1</sup> Nadia Serina, M.Sc.,<sup>2</sup> Lalo Magni, Ph.D.,<sup>1</sup> and Riccardo Bellazzi, Ph.D.<sup>1</sup>

## Abstract

The design and implementation of telemedicine systems able to support the artificial pancreas need careful choices to cope with technological requirements while preserving performance and decision support capabilities. This article addresses the issue of designing a general architecture for the telemedicine components of an artificial pancreas and illustrates a viable solution that is able to deal with different use cases and is amenable to support mobile-health implementations. The goal is to enforce interoperability among the components of the architecture and guarantee maximum flexibility for the ensuing implementations. Thus, the design stresses modularity and separation of concerns along with adoption of clearly defined protocols for interconnecting the necessary components. This accounts for the implementation of integrated telemedicine systems suitable as short-term monitoring devices for supporting validation of closed-loop algorithms as well as devices meant to provide a lifelong tighter control on the patient state once the artificial pancreas has become the preferred treatment for patients with diabetes.

J Diabetes Sci Technol 2011;5(6):1381-1386

Author Affiliations: <sup>1</sup>Dipartimento di Informatica e Sistemistica, Università di Pavia, Pavia, Italy; and <sup>2</sup>Advanced System Technology Group, STMicroelectronics S.r.l., Agrate Brianza, Italy

Abbreviations: (AP) artificial pancreas, (APUs) articifical pancreas units, (CPA) critical practice agent, (ICT) information and communication technology, (PC) personal computer, (PHR) personal health record, (RA) remote agent,

Keywords: artificial pancreas, diabetes management, mobile health, telemedicine

Corresponding Author: Giordano Lanzola, Ph.D., Dipartimento di Informatica e Sistemistica, Università di Pavia, Via Ferrata 1, 27100 Pavia, Italy; email address giordano.lanzola@unipv.it