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POWER2DM: PREDICTIVE MODEL-BASED DECISION SUPPORT FOR DIABETES PATIENT EMPOWERMENT

Statement of the Problem: There is an urgent need to develop cost-effective intervention strategies for diabetes. Given the enormous scale of the problem, and the fact that such a large percentage of cases arise due to an unhealthy lifestyle, personalized care systems that include innovative self-management support strategies, well-linked to the medical care of patients, are of prime importance.

Methodology & Theoretical Orientation: POWER2DM (started Feb 2016)will deliver a personalized self-management support system (SMSS) for T1 and T2 diabetes patients. It will offer a guided action plan for self-management by combining decision support based on personalised results of interlinked predictive computer models, e-coaching and e-advice feedback functionalities based on Behavioural Change Theories, and real-time collection, processing and interpretation of personal data (sensors) and self-management activities.

Findings: The user requirements, requirement analysis of the system architecture, and conceptual design of the architecture have been completed. The main software components Personal Data store, Authorization Service, sensor data integration module, Prediction Service, Action Plan Engine, and Communication Engine are nearing completion. A first prototype of the POWER2DM SMSS interlinking these components and providing user interfaces will be operational end of May. A Quantification Campaign to test use of the predictive models in practice currently runs in Netherlands, Germany and Spain.

Conclusion & Significance: POWER2DM is progressing well according to plan. The deliverables of the project will increase self-management capabilities and participation of the patient in the care process, resulting in better self-control and management of the disease. This will lead to better glucose management, thereby preventing severe episodes and long-term complications.

Biography

Albert de Graaf (Scientific Coordinator of POWER2DM) joined TNO in 2006 and works as a Senior Scientist coordinating activities on computational modelling for Predictive Health Technologies. He participated in several recent FP7 projects including MISSION-T2D and NuAge. The main modelling application areas are lipoprotein metabolism, cholesterol metabolism, gut microbial metabolism, metabolic disease and diagnostics, and systems medicine. Prior to TNO, he worked at Delft University of Technology (biological applications of Nuclear Magnetic Resonance), Philips Medical Systems BV (MRI/MRS techniques), Forschungszentrum Jülich, Germany (modelling and flux analysis of microbial metabolism for Metabolic Engineering purposes), and University of Maastricht (Metabolic pathway modeling and analysis). He was also co-founder and CSO of the French biotech company Metabolic Explorer SA.

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