InspectLife
- Complex Services For Telehealth of Diabetic Patients

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Abstract: **InspectLife is a web based platform for telecare and telehealth. It consists of several services which together represent complex tool for telehealth of chronic patients especially with diabetes mellitus type I from their home environment. The main services are telemonitoring of blood glucose, telemonitoring of blood pressure, telemonitoring of body weight, telemonitoring of physical activities and surveillance of diabetic patients. Telemonitoring measurement devices with wireless Bluetooth data transfer and mobile application are utilized. InspectLife solution is accessible for authorized users with different user roles (physician, patient, family member, operator) via internet with the help of standard web browsers. InspectLife solution includes receiving and storing of measured data, data processing, visualization and their analysis and also communication between all participants in the process of treatment of chronic diabetic patients. The InspectLife solution can help to diabetic patients and their physicians in terms of better diabetic compensation, better motivation and more effective treatment. Also the frequency of communication between patient and physician could be increased and also the quality of life of diabetic patients could be improved.**

Introduction

Number of patients with Diabetes Mellitus and associated diseases is constantly growing worldwide during last decades and actually this number is near 10 % of population not only in developed countries. Not only the Diabetes Mellitus itself but also associated serious health complication (i. e. renal failure, blindness or acute myocardial infarction) represent medical, social and also economic problem. In some countries also the availability of professional healthcare in remote rural areas is not sufficient. The principal goal in care of diabetic patients is the long term optimal compensation and minimalization of extreme values (hypo- and hyperglycemia). Telehealth and telemedicine with the help of up-to-date information and communication technologies could help to solve all the above mentioned challenges and to improve the quality of life, independence and self-sufficiency.

Description of InspectLife solution and services for diabetic patients

InspectLife is a web based platform for telecare and telehealth. It consists of several services especially for chronic patients with Diabetes Mellitus type I, i.e. telemonitoring of blood glucose, telemonitoring of blood pressure, telemonitoring of body weight, telemonitoring of physical activities and surveillance of diabetic patients. The main component is web-based information system which is securely accessible via web browser from any place connected to the Internet by all authorized users who participates in surveillance and treatment of patients, namely patients, their family members, medical doctors and healthcare professionals and operators of assistance surveillance centers. Monitored patients could be equipped with several telemonitoring devices, i.e. glucose meter, blood pressure monitor, body weight and pedometer. With the help of these devices patient is able to measure physiological parameters independently. Measured data are easily transferred via Bluetooth into mobile phone form which is consequently automatically transferred via the Internet into the InspectLife solution. Within the InspectLife solution all the received data is stored, processed and visualized. Patients and their medical doctors could remotely evaluate both actual and trend information about treatment based on complete and precise measured data. Also automatic notification of responsible persons in case of emergency situations (i.e. hypo- or hyperglycemia) could be raised.

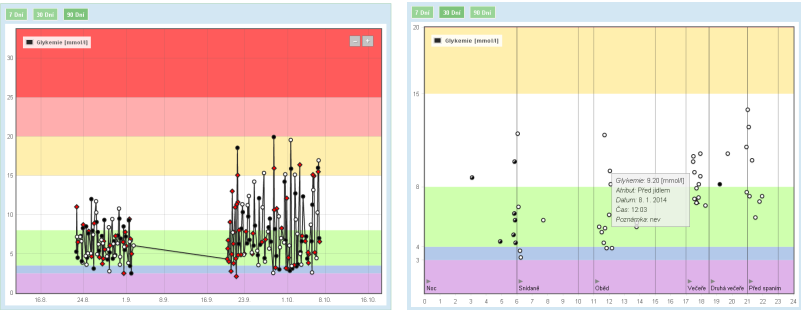

Fig. 1. InspectLife “Telemonitoring glycemia” service – time and summary graph.

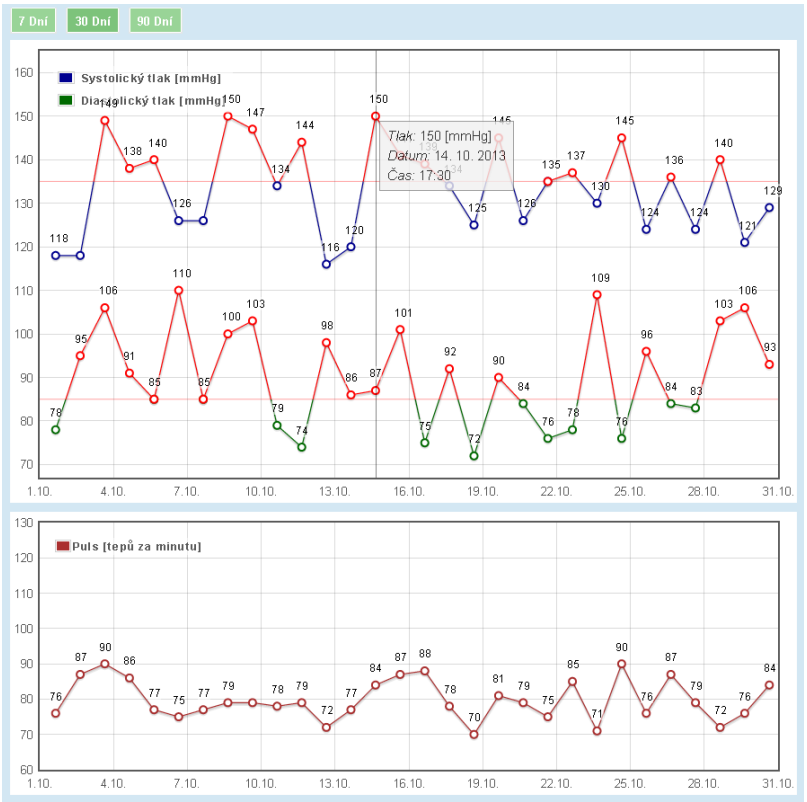

Fig. 2. InspectLife "Telemonitoring blood pressure" service graph.

Methods and Results

Pilot testing of InspectLife "Telemonitoring glycemia" service is being carried out in 2013 and in the first half of 2014 in cooperation with the Institute for the Care of Mother and Child (Prague, Czech Republic) and 2nd Internal Clinic of Vinohrady University Hospital (Prague, Czech Republic). The goals of the pilot testing are: 1) to verify the functionality of the InspectLife solution with real users – diabetic patients, 2) to demonstrate that InspectLife telemedicine solution can help in quality and complexity of acquired data, effective communication between patients and medical doctors and in better diabetes compensation.

Characteristics of one selected patient were following: woman with Diabetes Mellitus Type I diagnosed in 2002, treated with insuline pump from 2006. Telemonitoring during pregnancy in August and September 2013. Approximately 200 glycemia measurements per month were carried out. The results and influence of remote telemonitoring were the following: 1) patient has no technical or user difficulties with using of glucose meter, wireless data transfer and web application, 2) patient was regularly sending measured glycemia values and was satisfied with this possibility, 3) patient appreciated the possibility of quick remote contact with her diabetologist from home with the purpose of glycemia profile consultation.

Discussion and Conclusion

InspectLife "Telemonitoring glycemia" service is being tested in pilot project with real users. Target groups were suggested: diabetic women during pregnancy, labile diabetics with very unstable metabolic compensation, diabetics before surgical operation and young diabetics. The quality of life and comfort during diabetes treatment was increased. The quality of acquired data was increased.

Acknowledgment

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