

# InspectLife

## - Platform For Providing Telecare And Telehealth

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***Abstract:*** InspectLife is a platform for telecare and telehealth. Its main components are: surveillance of elderly people, children and chronic patients; ambulatory monitoring of physiological signals and parameters (blood glucose, blood pressure and others) including advanced data processing, visualization and analysis; and communication between all participants involved in the process of surveillance of clients and treatment of chronic patients. The fundamental component is web based information system InspectLife, which is accessible via web browser by authorized users, mainly clients, family members, operators of surveillance assistance centers, physicians and medical staff. The InspectLife solution should ensure preservation of clients' independence, improvement in their self-sufficiency, safety, quality of life, social contact and also quality of health care. Pilot projects were organized within the Czech Republic and Australia and their results were evaluated.

### Introduction

Number of elderly people and chronic patients (especially with Diabetes Mellitus, obesity and cardiovascular diseases) is growing worldwide during last decades. This situation is unfavorable, not only from medical and social but also from economical point of view. Dangerous are not only chronic diseases themselves, but also their serious complications (i. e. renal failure, blindness or acute myocardial infarction in case of Diabetes Mellitus). Prevention, appropriate lifestyle and continual individual treatment (i. e. optimal compensation in case of Diabetes Mellitus) are irreplaceable in contemporary medicine. Moreover, elderly people and chronic patients demand improvement of their quality of life, independence and self-sufficiency. It is obvious that up-to-date diagnostics, information and communication technologies are widely usable and can help with solving given challenges.

## Description of InspectLife solution

InspectLife [1,2,3,4] solution is designed for surveillance of elderly people and ambulatory telemonitoring of physiological signals and parameters (especially blood glucose, blood pressure and other) of chronic patients. Its 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, namely clients, patients, their family members, operators of assistance surveillance centers and physicians. InspectLife solution has several independent specialized subsystems (Surveillance, Diabetes, Hypertension and others) which are able to communicate to each other.

Basic functions of InspectLife information system are: receiving data from peripheral monitoring devices (i. e. surveillance devices – customized senior mobile phones, glucose meters, ambulatory blood pressure monitors and others) via Internet or GSM network (SMS), storing and providing information to the authorized users, processing and visualization of measured values, automatic notification of responsible users in case of emergency situations (i. e. hypo- or hyperglycemia in case of Diabetes Mellitus), communication between users (especially between clients/patients and physicians) and self-education of chronic patients. Every specialized subsystem is designed for selected target groups of users.

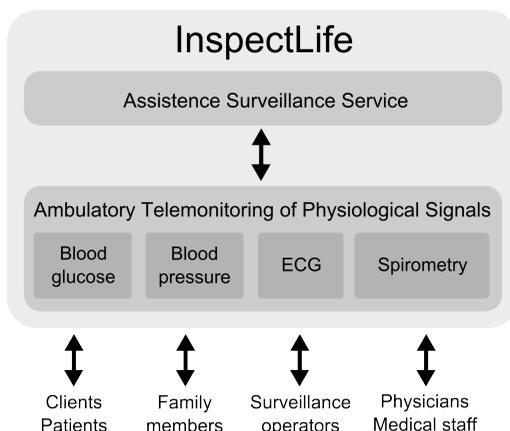


Fig. 1. Main components and participants within InspectLife solution.

## Methods and Results

### *InspectLife Surveillance*

InspectLife Surveillance solution was operated as a part of Australian telemonitoring and research project “Fall Intervention Through Technology” which took place in Australian Capital Territory during 2011 and 2012 in cooperation with the Anglicare organization and the University of Western Sydney (Sydney, Australia).

The trial project goals were: 1) to reduce and prevent falls and reduce the risk of serious consequences following a fall in older people, 2) to efficiently monitor those older people who have dementia, are wanderers, and so reduce their risk of falling.

It was selected 100 clients over 70 years of age who were supervised by Anglicare. These clients were equipped with surveillance devices (commercially available Android smartphone Samsung Galaxy 5 with pre-installed special InspectLife mobile application). Surveillance devices were able to notify responsible operators in cases of emergency and possible fall events. Moreover, devices were collecting their raw movement data (in certain interval before and after possible fall events) which was evaluated retrospectively in connection with real experience of users. Final evaluation of the trial project is still processed.

### *InspectLife Diabetes*

Preliminary testing of InspectLife Diabetes solution was carried out during 2011 in cooperation with the Institute for the Care of Mother and Child (Prague, Czech Republic).

The goals of the preliminary testing were: 1) to verify the functionality of the solution with real users – diabetic patients, 2) to suggest target groups of patients, 3) to suggest validation hypotheses and qualitative and quantitative criteria for subsequent clinical trial which should result in medical device certification of the InspectLife Diabetes solution.

Characteristics of one selected patient were following: 37 years old woman with Diabetes Mellitus Type I diagnosed before 3 years during her first pregnancy, insulin treatment, HbA<sub>1c</sub> 5.8 % during the first trimester, distant telemonitoring with InspectLife Diabetes between 26. and 35. week of pregnancy, childbirth in 38. week of pregnancy.

The results and influence of distant telemonitoring were following: after 30. week of pregnancy the HbA<sub>1c</sub> was permanently within the interval 4.3 – 4.6 %, therefore improvement of diabetes compensation was reported during telemonitoring period. Both patient and her diabetologist appreciated the availability and visualization of actual and historical blood glucose data

from any place with internet connection and possibility of quick contact and remote communication.

## Discussion and Conclusion

InspectLife solution was analyzed and designed. Two components (subsystems) – “Surveillance” and “Diabetes” were implemented and verified within trial projects with real users.

Mediinspect company gained real experience in providing assistance surveillance service to real users and started to operate InspectLife Surveillance solution commercially within the Czech Republic.

InspectLife Diabetes subsystem was also verified in practice. Target groups were suggested: diabetic women during pregnancy, labile diabetics with very unstable metabolic compensation, diabetics before surgical operation and young diabetics. Main validation hypotheses for clinical trial were suggested: long-term metabolic compensation should improve (in terms of HbA<sub>1c</sub> value), number of critical situations (hypo- and hyperglycemia) should decrease, distant communication between patient and physician should be more frequent, self-education of diabetic patient should improve, comfort of patient should improve. These validation hypotheses should be validated and InspectLife Diabetes solution should be certified based on clinical trial organized in the Czech Republic

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## References

- [1] K. Andělová, “InspectLife Diabetes – Telemedicine Information System for Diabetology”, 15<sup>th</sup> Conference on Technologies in Diabetology “Žinkovy dny”, poster presentation, 2011 (in Czech).
- [2] M. Anděl, K. Andělová, Z. Rušavý, J. Potůček, P. Koranda, “Distatnt Transfer of Data in Diabetes Care” in *Diabetologie, Metabolismum, Endokrinologie, Výživa*, TIGIS, Prague, Czech Republic, Vol. 15, No. 2, pp. 119-122 2012 (in Czech)
- [3] J. Potůček, T. Korč, P. Koranda, J. Kamrád, J. Douša, “InspectLife – Information System For Surveillance And Telemonitoring, IFA 11<sup>th</sup> Global Conference on Ageing, Prague, Czech Republic, 2012.
- [4] J. Potůček, “InspectLife – Information System for Surveillance and Telemonitoring”, ITU Telecom World, Geneva, Switzerland, 2011.