

FrailSafe Medical News

Materia Group, a Care Service Provider for Older Adults in Cyprus

Cyprus counts among the smaller countries in the EU, and even though it used to present a historical positive development, the country couldn't prevent a significant economic setback brought by the 2012-2013 financial crises. Health in general, and healthy ageing in particular, haven't been preserved by the setback.

The lack of solid health systems and services within the public sector in Cyprus has created a gap in the health market, encouraging a much more active role played by the private and non-governmental sector.

Materia Group is a private sector, multi-shareholder social enterprise . In a country where most businesses in our sector are small, family-run units, we are the only organization of this form on the island, where we own and operate two units (90 beds and a wide range of in-patient and out-patient services like day-care, physio centers, memory center), a home-care and counselling programme and consulting services to older adults and their families.

Materia philosophy, just like FrailSafe philosophy, is that an inter-disciplinary team is necessary to target the complex challenges of understanding ageing and creating an environment where people can age comfortably and independently.

Charis, head of our physio department, Stratis, our speech therapist, Saroj and Stavroula, heads of nursing team, Thekla, head of the psychosocial department, Kimon and Stelios our geriatricians, and a large number of administration, catering and cleaning staff, along with their teams who are trained to work with older adults, create the family we call Materia Group. All these professionals make it possible for Materia to be a training center for all universities in Nicosia in health and social sciences (medicine, nursing, psychology, physiotherapy, speech language pathology, nutrition, social work, sociology, and business).

[...]

[...]

Working with frail older adults is the very center of our core business for the last 16 years, as on average 92% of the patients residing in our units are frail . On the other hand, most of the older people we attend through our home care programme belong to the pre-frail group. Those benefiting from our programmes have a lot to gain from FrailSafe, both in terms of personal well-being and quality of life for them and their families, but also in terms of decreased care costs.

Materia is one of the three clinical partners in FrailSafe. Along with the Univeristy of Patras and University hospital of Nancy, we are securing the close involvement of the end-users in this project by receiving valuable feedback through different methods (questionnaires, interviews, meetings, testing of processes and products, clinical examinations etc). It helps ensure that the outcomes of FrailSafe match their needs, acceptability requirements, and expectations. Moreover, based on their feedbacks, our IT partners have the mission to modify their work accordingly, as the medical and technological objectives of FrailSafe are interrelated. In fact, this is a part we very much enjoy about working in FrailSafe, as the IT world is new and exciting to us and users of FrailSafe. We are excited to be the first ones to witness the real-life application of all those hours of brainstorming, Skype meetings, email exchanges, guidelines and tests, on older peoples' everyday lives. Finally, we are convinced about the real potential of FrailSafe that will add more healthy, independent years to peoples' lives.



Figure 1 — Residents and staff from Materia Group

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The French Team Heard on the Local Radio

On Friday 30th of September, Professor Benetos, director of the CHU Nancy's Geriatric department and leader of the FrailSafe project on behalf of INSERM partner, was invited to speak about the FrailSafe study on the local radio station "France Bleu Lorraine Nord".

Prof. Benetos explained the significance of the frailty syndrome and the risks for disability it bears for older adults. He equally pointed out the importance of the early detection and eventually the prevention of frailty in the maintenance of autonomy. Prof. Benetos called for volunteers to participate in the FrailSafe study that will encourage and favour older people's independent way of living. The interview triggered the auditors' interest for testing the FrailSafe approach.

Following the broadcast, several volunteers expressed their wish to take part in the FrailSafe study by getting in telephone contact with the investigator team

For further information about the French team, please contact Professor BENETOS Athanasios secretariat.geriatrie@chu-nancy.fr

Older Women Association in Greece

On 7 November 2016, a public event was organised by the "Panathinaiki Women's Association", a voluntary organisation of older women, to inform the public about FrailSafe at the Commercial Chamber of Patras (Greece). Dr. Yiannis Ellul, Associate Professor of Neurology and Geriatrician, spoke about frailty and highlighted the aims of the FrailSafe project. Dr Antoniathou, a physiatrist, was also invited to speak and stressed the need of exercise to improve both balance and walking as people age.

Patras' community warmly responded to the call of the Women's Association. The event was attended not only by members of the association, but also senior citizens with their relatives, staff from the Rehabilitation Centre of the University Hospital of Patras, and members of the Geriatric and Gerontology Association of NW (Greece). FrailSafe partners were glad to see that many participants volunteered to take part in the project.



FrailSafe Technical News

The Virtual Patient Model (VPM)

One of FrailSafe objectives is to generate reliable advanced intervention services and determine the risk of triggering events that would make a person tip from the pre-frail category to the frail one. To do so, the technical partners have designed and developed a detailed definition of a personalized **Virtual Patient Model** (VPM) composed of older people information. These will be collected by unobtrusively monitoring their everyday life through a variety of embedded and wireless smart indoors and outdoors sensors, social interaction, clinical assessment and self-evaluation tests. In other words, this VPM will be the older person's virtual alter ego, reflecting their medical condition (see Figure 2).

The model will be personalised, in a sense that the frailty related entities are categorized into data related to the (i) user identification, (ii) summary of the data recorded from the integrated sensors as well as the questionnaire and game analysis, (iii) archived medical data essential to the clinicians such as comorbidities and test results, and finally (iv) a list of parameters that are linked to the recognition of short-term (for example fall detection) and long-term events (change of frailty metric).

The VPM will be coupled with a monitoring system that will (i) facilitate the analysis of the collected data and frailty feature extraction, (ii) support the physician in his/her decision process ranging from general health preservation monitoring to critical situation management, (iii) allow an adaptation of the user interfacing and (iv) provide a personalized feedback to the older person via lifestyle change suggestions, behaviour guidelines and medical intervention strategies.

Thanks to this personalised VPM and monitoring system, the older person will benefit from a system that gives him/her an optimal overview of his/her (pre-) frail state and at the same time, provide them with a tool that enable them to take the right decision concerning frailty prevention.

For further technical information about the VPM, please contact Andreas Vasilakis (abasilak@iti.gr).

FrailSafe Technical News

Electronic Case Report Form (eCRF)

The main objectives of FrailSafe is to better understand frailty and be able to recognize common patterns through data collection that would explain when a person tips from the non-frail to the frail category.

The technical and clinical partners worked together to set up an **Electronic Case Report Form (eCRF)** that would enable the clinical partners to gather data of volunteers in a digital form. Indeed, along the project, volunteers from three different locations (Patras in Greece, Nicosia in Cyprus and Nancy in France) have accepted to take part in the FrailSafe study. They will have at their disposal technological devices, such as a smart vest, beacons, and a tablet with augmented reality games to test their cognitive abilities. They will also undergo a series of test to measure for example their strength, blood pressure and gait and fill in some questionnaires about their well-being and social interaction for example. Through these devices, tests and questionnaires, data will be collected through the eCRF in a digital format (see Figure 3). It will enable technicians and clinicians to extract the relevant information to better understand where lies the limit between non-frail and frail.

A digital format prevailed over a paper version for various reasons, such as eliminate unnecessary duplication of data; avoid data entry errors; facilitate the collection of data and remote monitoring of data; and promote real-time access for data review. The eCRF is built so as to allow clinicians staffs that are in charge of gathering the data, to access the eCRF whenever and where ever there are, as long as they have a web browser (e.g. Chrome, Firefox, Internet Explorer, Safari, Opera).

The eCRF is completely secured as the clinicians will need to authenticate themselves in order to access it. Moreover, the data will be encrypted before being stored on the database to protect the privacy and the integrity of the exchanged data. Finally, the eCRF system has been created in order to support the different work languages used in FrailSafe, namely French, English and Greek. This will help avoid translation errors or misunderstandings during the trials execution.

The eCRF is a technological tool that was produced thanks to a close interdisciplinary collaboration of the technological and medical teams. The tool will allow a proper assessment of the objectives of the project by organising in a simple way the collection of the data. It will also help reach a common goal, namely the implementation of the clinical trial protocol by the mean of an ICT instrument.

For further information concerning the architecture of the eCRF, contact Luca Bianconi (luca.bianconi@grupposigla.it)

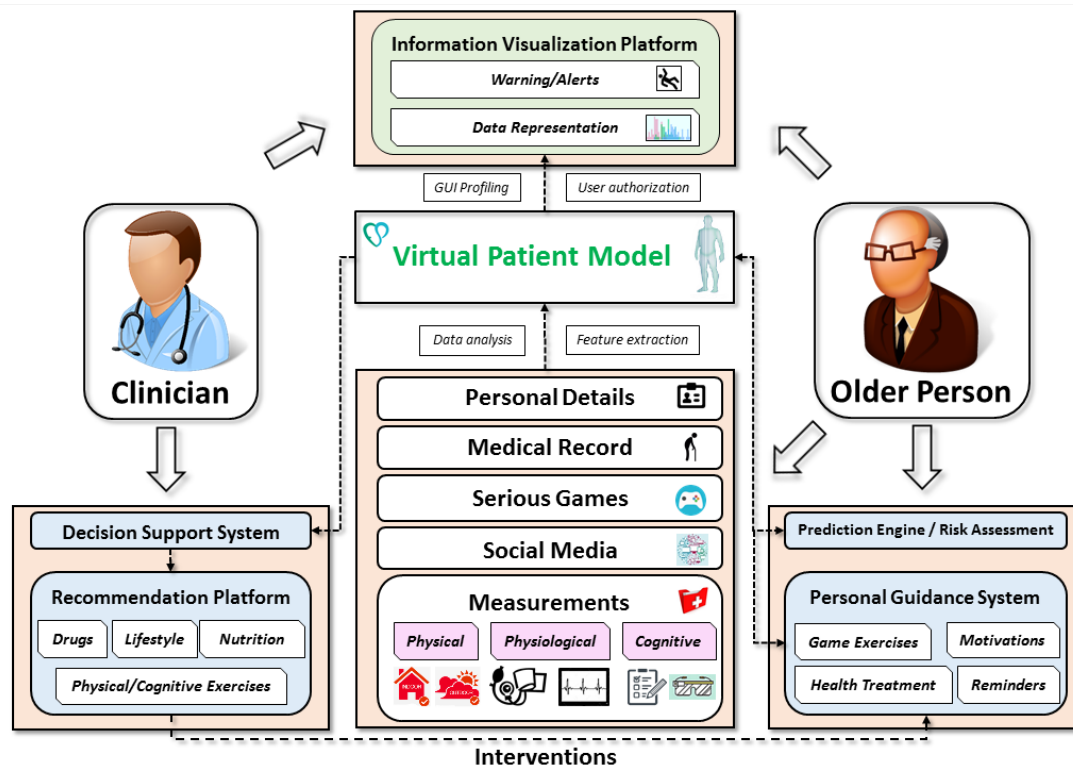


Figure 2 — FrailSafe intends to develop a reliable and personalized monitoring system by putting the older person and his/her profile at the core of the system

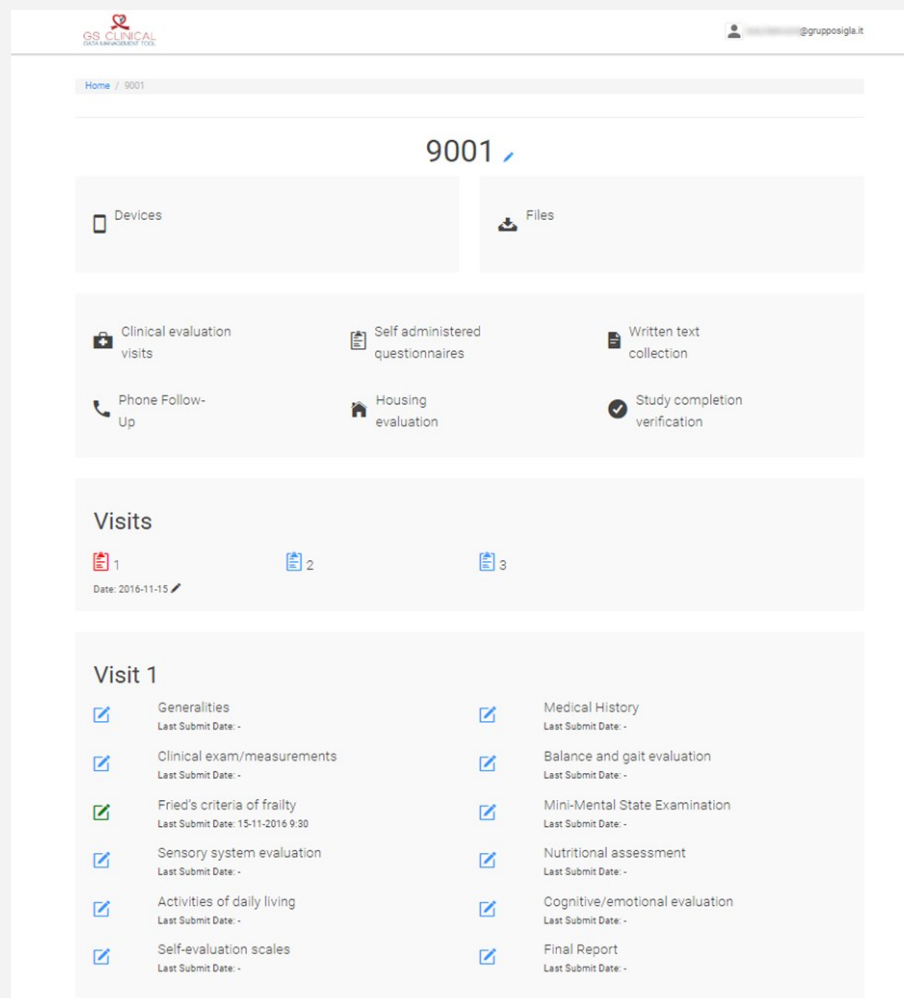


Figure 3 — Main clinical staff dashboard

FrailSafe Technical News

Cognitive Game in the Supermarket

Games with a purpose are invaluable tools to encourage the user participation in **health monitoring applications**. The usage of games to monitor the physical and cognitive status of older persons is a core concept of the FrailSafe project. The aim is to create attractive games which can engage the user to an intriguing task employing physical or cognitive action, so that, indirectly, physical and cognitive parameters can be monitored. Even further, such games are not limited to mere monitoring, but can be exploited as a means for the older person to perform physical or mental exercises, towards the goal of rehabilitation and frailty prevention.

Within this context, a **virtual supermarket game** (VSM) has already been in use in the project and will be further developed until its end thanks to volunteers' feedback. The VSM simulates the experience of a person shopping in a supermarket in a 3D environment (see Figure 4). At the beginning of the game, a list of items is presented and the task of the user is to navigate through the supermarket, select the listed items from the shelves, in the correct quantities, and pay the correct amount at the cashier. The performance of users in the game has been shown to be related to indications of Mild Cognitive Impairment (MCI), which is a condition that often predates Alzheimer's disease. In this respect, it is a valuable tool for FrailSafe in order to detect deterioration in the cognitive function of the users, which is often an indication and result of frailty.

The first version of the game was implemented for the purposes of the EN-NOISIS European project. It was a cooperation of the Aristotle University of Thessaloniki, the Greek Association of Alzheimer's disease and the Centre for Research and Technology Hellas/Information Technologies Institute (the latter currently being a FrailSafe partner). In an article published in the Journal of Alzheimer's Disease¹, it indicated that the performance of the users in the VSM application was highly correlated to MCI indices, suggesting that the application can be used as a tool for diagnostic purposes.

[...]

¹ Zygouris, Stelios, Dimitrios Giakoumis, Konstantinos Votis, Stefanos Doumpoulakis, Konstantinos Ntovas, Sofia Segkouli, Charalampos Karagiannidis, Dimitrios Tzovaras, and Magda Tsolaki. "Can a virtual reality cognitive training application fulfill a dual role? Using the virtual supermarket cognitive training application as a screening tool for mild cognitive impairment." Journal of Alzheimer's Disease 44, no. 4 (2015): 1333-1347

[...]

This cognition-related diagnostic capability of the virtual supermarket game will be used for the purpose of the FrailSafe project, i.e. the automatic diagnosis of frailty. However, the ultimate purpose is to not restrict the game to cognition-related features. Similar to all FrailSafe games, attempts have already started in order to embed FrailSafe devices and sensors, such as the dynamometer, as input devices with which the user will be able to control various aspects of the game. The usage of these devices will enrich the virtual supermarket application with diagnosis and rehabilitation features with respect to physical parameters, apart from the existing cognitive ones.

For further technical information about the virtual supermarket game, please contact Kostas Votis (kvotis@iti.gr).



Figure 4 — A screenshot of the Virtual Supermarket game. The user performance at the task of selecting the requested items from the shelves and paying the correct amount has been found to be correlated to cognitive deterioration

Information

Mobihealth 2016 Conference

University of Patras participated at the [Mobihealth 2016](#) conference (14-16 November 2016, Milan) to present a scientific paper entitled “Investigation of sensor placement for accurate fall detection”. Fall detection is typically based on temporal and spectral analysis of multi-dimensional signals acquired from wearable sensors such as tri-axial accelerometers and gyroscopes which are attached at several parts of the human body. The aim of the paper was to investigate the location where such wearable sensors should be placed to optimize the discrimination of falls from other Activities of Daily Living (ADLs). To this end, feature extraction and classification based on data acquired from a single sensor unit placed on a specific body part each time were performed. The investigated sensor locations included the head, chest, waist, wrist, thigh and ankle. Evaluation of several classification algorithms revealed the waist and the thigh as the optimal locations.

Don't miss it!

FrailSafe leaflets available in three different languages

What is Frailty? What is FrailSafe and who are the partners involved in the project? What are the objectives and long-term vision? Your questions are being answered in our leaflets:

- English version [here](#)
- French version [here](#)
- Greek version [here](#)



Events

International Conference on Frailty and Sarcopenia Research

The international conference will focus on topics such as physical frailty and age-related body composition modifications and cognitive frailty. It will take place in Barcelona, Spain, on 27-28 April 2017. Further information [here](#).

The International Symposium on Mobile and Assistive Technology for Healthcare (MATH2017)

The mini-symposium will gather stakeholders from the research and scientific fields addressing challenges related to the healthcare technology. The main topic of the symposium will be on “ICT applied for mobile healthcare and wellbeing” and will focus particularly on: patient safety, prevention, health management and wellbeing. Further information [here](#).



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