

Title of the symposium: Supporting home nurses in the assessment of care dependency and needs by using Artificial Intelligence technologies

Chair/presenters (including country):

- Chairperson: Yelliz Mattheus - staff member at Wit-Gele Kruis (WGK) Vlaanderen.
- 2 presenters from WGK Vlaanderen (Belgium): (incl. the chairperson) - The WGK represents the largest non-profit organization for home nursing in Flanders, with over 5000 nurses taking care of 150.000 patients.
- 2 presenters from the Vrije Universiteit Brussel (VUB, Belgium): The electronics and informatics dept. (ETRO) of VUB, has extensive expertise in developing sensor systems, signal processing and clinical decision support systems based on Artificial Intelligence (A.I.) methods.

Description of the symposium

Background: The enormous growth of the older population will increase the number of older adults that will need care at home and the number of older adults in residential care. In particular the cost for society of the latter fraction of the older population is predicted to become huge. This, together with the personal preference of many older adults to stay at home, explains the need to prolong independent living [Uddin et al., 2018], [UN 2015]. The most important prerequisite for care and support to extend independent living, is that the need for dedicated care is detected early. Without timely interventions, older adults might gradually lose independency related to basic activities of daily living (ADL) such as bathing, dressing, toileting, transferring, continence and feeding [Diehr et al. 2013]. These declines may result in a situation where home care is no longer feasible and hence admission to residential care becomes necessary. To help tackle these giant challenges, and to counter the lack of resources, the WGK and VUB are setting up a series of projects to investigate how technologies such as A.I. can provide help. This is the first project and focusses on: objectively and correctly assessing the care needs of the older adult living at home, starting from the existing clinical scales for evaluating a person's level of dependency: the KATZ and BelRAI scales. Today, the residential care and home nursing sector uses a Belgian version of the Katz-scale to evaluate a person's level of dependency on the six ADLs [Katz, 1983]. This methodology is based on an observation of the person and requires training of the assessor. Hence, Katz-scores are often given subjectively. As the Katz-score is used to determine the care need, and thus a nomenclature code (and corresponding fee) is decided upon, they are frequently prone to discussion. A large field study showed significant differences in the scores given by home nurses and the health insurance funds [Paquay, De Vlieghe, 2014]. Recently, the Federal Government launched pilot projects to evaluate the BelRAI scale as a multidisciplinary instrument to identify care needs of frail and dependent older adults (BelRAI.org). However, scientific and political unity on its use within the national health insurance hasn't been reached yet.

Aim: The ultimate goal of the project is thus *to develop and validate a cost-effective and minimally invasive sensor-based system for the objective detection of early care needs in independently living older adults*. This sensor system would tackle both the challenge of scoring discussions as to enable earlier detection of care needs.

The first phase of the project is a feasibility study in which research is conducted to gain insights in the current state of the art, the existing sensors/technologies that are available to measure ADLs, the applicability of these technologies in daily life and the environment of patients and the applicability of the system in the current care process.

Set-up and topics of symposium: In the context of the feasibility study of this project, we would like to organize an interactive symposium in which an inspiring discussion can take place about the topic: “early identification of care needs in homecare using A.I. Technologies”. The discussion will be facilitated by the 2 presenters of WGK and the 2 presenters of VUB. The symposium will be composed of three parts:

- Part 1: Introduction of the project and workshop by chairperson and announcement of preliminary results (15 min.)
- Part 2: Workshop in breakout sessions (60 min.) The audience will be divided into 3 groups. In each group, an interactive dialogue can take place to provide an answer to the below three questions (20 min. per question). The discussion will be facilitated by one of the presenters.
 1. What are the relevant clinical parameters that need to be measured to evaluate care dependency and care needs at home?
 2. How can sensor/AI technologies help nurses with the evaluation of care needs? Which sensors are suited for this?
 3. How ready is the home nursing sector (patients & nurses) for the introduction of this kind of system? What are the conditions that need to be met in order for the sector to be ready?
- Part 3: Plenary feedback of the group discussion – take home messages (15 min.)

Implications and future perspectives: The insights gained in the discussion above will be used as input for the feasibility study, which will be followed by a development project, in which an automated intelligent decision system that detects care needs will be developed and validated in a patient study.

Learning outcomes for the audience: The goal of the symposium is to exchange experiences and opinions about current evaluation systems of care needs and about the possibilities of the use of sensor/AI technology in home care, including end user experiences.

References:

- [Uddin et al., 2018] Uddin, M..Z.; Khaksar, W.; Torresen, J. Ambient Sensors for Elderly Care and Independent Living: A Survey. *Sensors* 2018, 18, 2027. <https://doi.org/10.3390/s18072027>
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