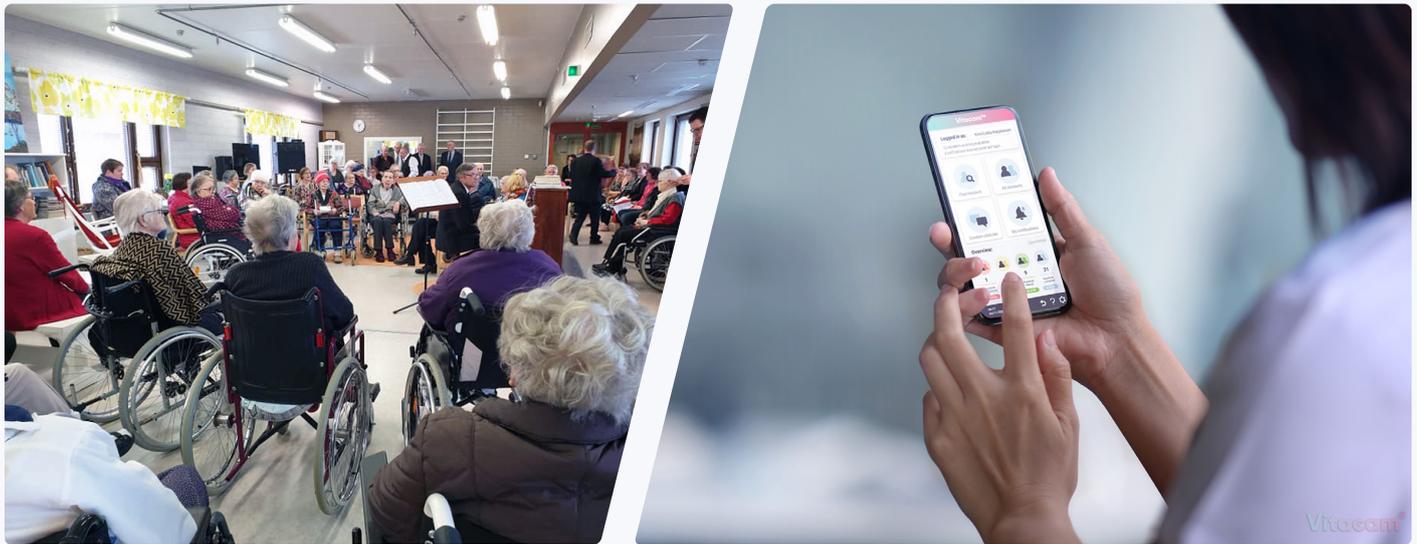


Monitoring the wellbeing of the elderly using Vitacam

Period: October 18 to Nov 29, 2021

Location: Assisted living facility Kataja (Asumispalveluyksikkö Kataja), Taivalkoski – Northern Finland



Photos: Municipality of Taivalkoski, NE Device SW

CORE PROBLEM

How to enhance care of a frail elderly population with complex health needs, living in a residential facility.

ABOUT KATAJA

Kataja is an assisted living facility located in Taivalkoski municipality in Northern Finland. The facility houses 25 elderly persons with a typical comorbidity profile of Alzheimer's disease and at least one of hypertension, cardiovascular disease and hypercholesterolemia. Over the course of a year, 26% of residents are hospitalised or need to visit the emergency department.

The residents are provided with personalized rooms and enjoy a full program of social events, as well as daily meals served in a communal area. The facility staff includes 14 carers and one trained nurse, who is on call during weekday day shifts. During the night, a duty officer in charge of responding to emergency calls for home care is also available to Kataja residents.

CURRENT CLINICAL PATHWAY

In Kataja, blood pressure is checked once a month from all residents, and weekly or daily upon need for hypertension and cardiovascular issues. Weight is also measured monthly and blood glucose is measured at least once a week for diabetics. These measurements are initially taken on paper and then transferred manually to an electronic health record system (EHR). Care plans exist in case of escalations, such as updating diuretics or fast insulin for diabetics. Observations relating to residents' condition are recorded in the EHR daily and are relayed from one shift to another verbally and by reading the EHR.

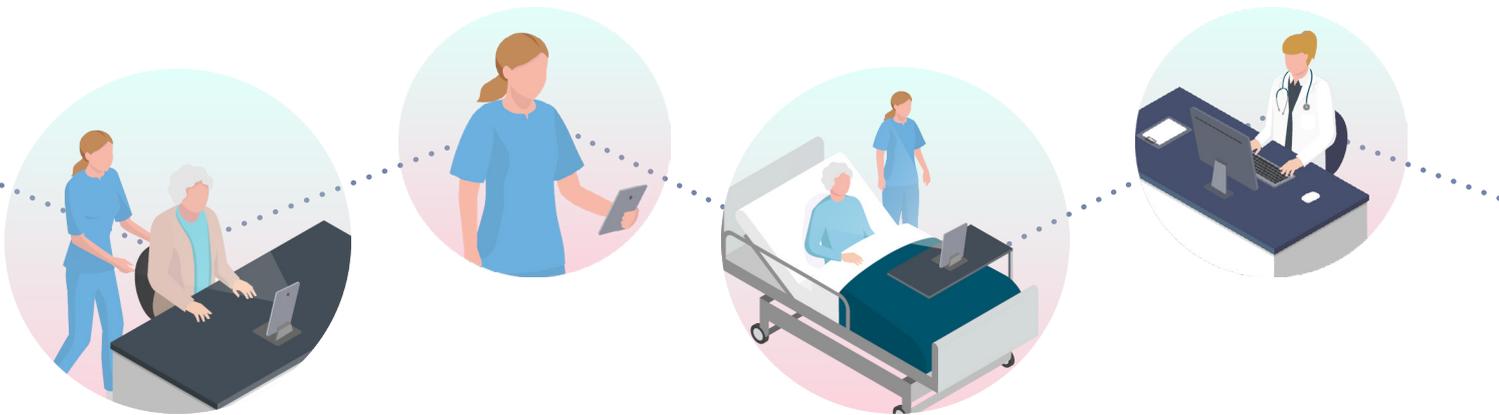
The facility nurse consults with a primary care physician once a week in an online meeting. During these consultations, the results recorded to the EHR are used to discuss residents' wellbeing and make changes to their care, such as medication. For escalations, a carer usually alerts the nurse, who evaluates the situation and either consults the physician again or reserves a triage appointment. Emergencies during the evening or the weekend are handled 64 km away in Kuusamo health center.

ENHANCED CLINICAL PATHWAY

Some of the residents at Kataja suffer from cardiovascular disease, including chronic heart failure and COPD. Systematic respiratory rate and heart rate measurements would help track their wellbeing on a more comprehensive scale, while measurements can also be used to provide up-to-date information on residents with breathing difficulties. Vitacam vital signs monitor can provide this information through simple video measurements on a nurse-operated smartphone.

The measurements are obtained by recording a video of the subject while they are sitting down or resting. This video is then sent from the Vitacam mobile application to a cloud server, where the results are processed and then returned to the application categorized and colour-coded based on the assigned NEWS score.

In case of abnormal measurements, the carer can first seek guidance from the nurse or the manager. Further guidance can be obtained from primary care who also know the resident's medical history. In practice, this can translate to a change in medication or further examination or hospitalisation, for example.



RESULTS

Over the six week trial period, 251 measurements of both respiratory rate and heart rate were taken from seven residents selected as the most suitable. They were aged 85–90 years, with a history of COPD and cardiovascular disease. On average, six videos were recorded per day with Vitacam returning measurements in 91% of cases. In the minority of cases when no results were obtained, the main causes were identified as insufficient lighting, subject movement or hand-held use of the smartphone rather than using the provided table stand.

During the trial, three interventions were made based on Vitacam observations, including one resident being hospitalised due to measurements indicating an inflammation related to heart failure. As the heart weakens, the breathing compensates to ensure the body gets enough oxygen. This could be seen in Vitacam-provided measurements as a rapid rise in measured respiratory rate over a 3 day period. Using these observations, Kataja personnel were able to escalate to primary care remotely who supported a change of medication and hospitalisation of the resident for heart failure. After a five day stay in the hospital, the resident returned to Kataja.

Another resident was also identified with breathing difficulties, evidenced by a high RR, accompanied by fluid build-up. Through consultation with primary care, it was determined that a pulmonary edema had occurred requiring timely treatment. This was treated through diuretics. Measurements were also used to support medication for fluid removal with a different resident who presented a high respiratory rate over successive days.

Abnormal values were detected in other cases but did not require further interventions.

CONCLUSION

Introducing new and more frequent vital sign measurements to elderly care has clear benefits. In particular, the addition of respiratory rate provides real value in monitoring elderly residents with complex medical needs. Better, more comprehensive data also allows for more decisive interventions, as was seen even in the short trial period.

On average Vitacam performed well in these settings and the users rated the device 4.7 out of 5 for ease of use. The use of video recording was well accepted by both staff and residents, safe in the knowledge that the videos would be deleted immediately after processing, and with the knowledge that it was being used for measuring vital signs.

Pirjo Kouva (Manager) summarised the clinical need as follows: "NEWS scoring helps to highlight worsening heart failure, along with observations of swelling and blood pressure. Sometimes changes in a resident's health can be difficult to see with the naked eye or they can be overshadowed by prevalent symptoms of dementia, in particular due to restlessness. In such situations, measurements help point direction." While further detailed analysis is required to obtain a full economic impact, Kouva also saw promise here: "With Vitacam, it's possible to get medical attention to an elderly person sooner than previously."

Based on the trial, multiple improvements to Vitacam itself will include automatic detection of lighting conditions and reductions to upload and processing time of the video.

Further information:

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