Background: Orthopnea and paroxysmal nocturnal dyspnea (O-PND) are cardinal signs of worsening heart failure (HF). Guidelines for HF patient management recommend routine assessment of O-PND. These postural symptoms are typically assessed by asking about patients’ sleep angle in terms of number of pillows. We evaluated the use of automated posture sensing in assessing O-PND in HF patients.

Methods: 46 HF patients (35 male, 45-83 years of age, NYHA class I-III) in the Mul-tiSENSE study wore an external posture monitoring device for a few days (0.9-14) at a time. At each patient visit, O-PND symptoms were assessed. We compared the device-determined night-time elevation angle (NTEA) for patient visits with & without reported O-PND symptoms.

Results: Patient visits associated with O-PND (n=24) had an average NTEA of 23.2 ± 2.8 (mean ± standard error), compared to an average NTEA of 10.7 ± 1.7 for those patient visits not associated with O-PND (n=41, p = 0.0001 using non-paired t-test). A receiver operating characteristic (ROC) curve analysis (see figure) yielded an area under the curve of 0.79 for NTEA detecting O-PND. Selecting an NTEA threshold of 14.8 yielded a sensitivity of 83% and specificity of 76%.

Conclusion: Orthopnea & PND are key symptoms of HF. Night-time elevation angle is indicative of these symptoms, presumably reflecting the tendency of patients to sleep partially elevated to avoid dyspnea. Monitoring posture in future devices may provide valuable insight for the remote management of HF patients.

Figure 1. Kaplan-Meier curves of the cumulative survival of O-PND patients

Objective: The main goal of this study was to analyze the impact of telemonitoring (TLM) in elderly patients with chronic or post-acute heart failure (HF), and the presence of ≥1 social needs, requiring intensive home monitoring.

Methods: The SmartCare Project was developed as a cohort, prospective, randomized, controlled trial that enrolled from November, 2014 to February, 2016, 201 pts in home care (>50 years, at least 1 severe chronic diseases - HF, COPD or diabetes - and ≥1 missing BADL) to intervention arm (INT - automatic BP monitoring, weight, FC, SO2, ECG; n=100) or usual care (UC; n=101). At the end of the program, a culturally adjusted eCare Client Impact Survey (eCCIS) was collected in pts randomized to INT.

Results: General data collected: the patients enrolled were elderly (81 years, 54% males) and with multimorbidities (44% Charlson Index ≥5, 58% ≥7 drugs/day). HF was present in 79% of pts, COPD in 38%, diabetes in 68%. Most pts showed a low level of education (primary school in 38% of end users); 39% were living alone, and 42% were reliant on care. Data eCare Client Impact survey was collected in 45 subjects out of 88 INT users. Reasons for non-responding were: death, hospital admission, not directly involved in self-monitoring activities. Out of a total of 45 respondents, 26 end users experienced a positive increase in motivation; 35 experienced a better emotional wellbeing; 30 experienced a greater ability to perform daily physical activities; 30 had a reduction in anxiety; 29 felt less lonely; 19 experienced an improvement in their relationship with their family carer; 29 experienced an improvement in their relationship with their professionals; 35 felt a general improvement in their ability to manage their health condition; 39 expressed satisfaction with the service, and 39 felt the service was well worth the effort and would continue to use it.

Conclusion: While considering that the questionnaire involved about 50% of patients in the intervention group, the data collected showed good acceptance of TLM system with improved self-care and relationships with relatives and health workers, reduction of anxiety and loneliness. Patients have also expressed a positive opinion about the service and wish to continue with TLM.