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Telemonitoring of patients with chronic heart failure (CHF): evaluation of mortality, costs and utilization

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Background: The telemonitoring program aims at optimizing the treatment for high risk CHF patients (NYHA II-IV) of a German sickness fund. All participants were equipped with remote monitoring devices such as body-scale, blood pressure monitor or 12-channel ECG system. With these devices information are collected in electronic medical records and analysed by a medical professional, who contacts the patient according to a predefined algorithm aiming for early interventions in order to prevent emergency hospitalization. The 24/7 intervention program is supported by coaching modules related to co-morbidities. All patient related data were provided by the sickness fund.

Methodology: For the evaluation the patient collective of a German sickness fund was screened for eligibility. Inclusion criteria are at least one inpatient stay due to heart failure or related conditions within the past 24 months before the start of the program as well as at least one outpatient diagnosis of heart failure or heart failure related diseases. Exclusion criteria are defined to eliminate patients with diagnoses such as cancer treatments, dialysis or mental illnesses.

After the first selection of all relevant patients for the study population patients are assigned to either intervention or control group. To ensure pre-treatment balance on important characteristics between treatment- and control group different methods such as propensity score matching and propensity weighting are used. For these methods patient characteristics e.g., on costs, medications and comorbidities are used for the period of 24 months before the start of the intervention. Intervention groups were enrolled in 11 waves. The observation period was 24 months (Q3/2015-Q2/2017). In a first analysis total health care costs consisting of inpatient and outpatient care, pharmaceutical as well as medical aids were analysed. Following this outpatient contacts, length of hospital stays and the number of prescribed drugs related to heart failure will be analysed. Further, mortality will be used as an outcome parameter.

Results: Preliminary results for the Gamma regression after propensity score matching on 714 patients in each group suggest a significant negative effect of the intervention of 0,1431 (p=0,005) for the total cost in the study, leading to an average decrease in cost of –2.187€ per patient. There were 998 hospitalizations accounted for in the intervention group vs. 1197 hospitalizations in the control group.

These effects appear to be driven by a decrease in inpatient costs, while costs in other areas such as outpatient care or drugs increased slightly.

Conclusion/Outlook: The preliminary results using propensity score matching suggest a sizable cost reduction for patients in the telemedical treatment group. Results on utilization and outcomes are still pending.