

CORDIVA - Real Life Heart Failure eHealth

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INTRODUCTION

CORDIVA is real life eHealth programme for heart failure (HF) patients provided by Gesellschaft für Patientenhilfe DGP mbH (GPH) on behalf of three major German health plans. In Germany, it currently cares nationwide for 11.000 patients, more than 26.000 have participated so far. The main objectives are reduction of all-cause mortality and hospitalization, reduction of total medical expenditures and improvement of the patient's quality of life.

The technological backbone of CORDIVA is a modular IT platform, which was developed by GPH. CORDIVA comprises the following components:

- Patient education and training in order to strengthen self-care
- Remote monitoring to detect worsening of disease at a particularly early stage enabling early intervention
- Facilitated patient screening and follow-up by IT integration into existing pathways

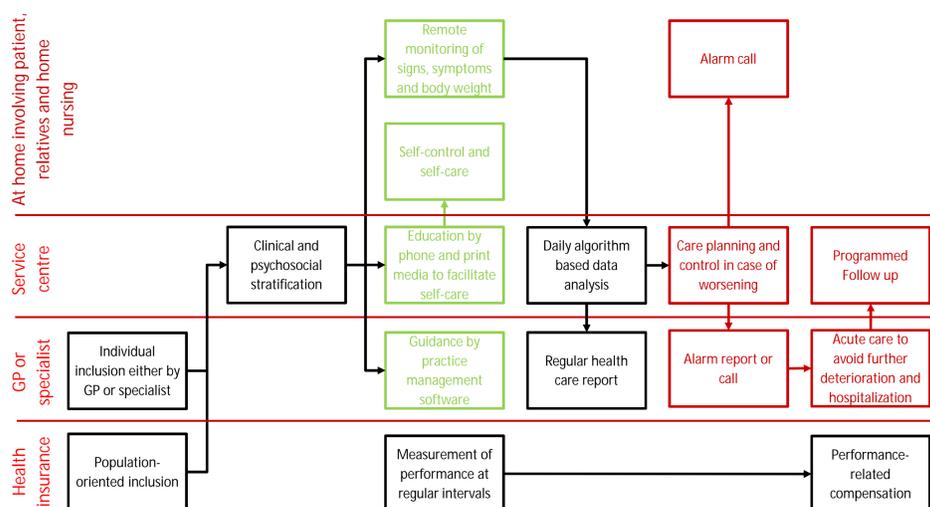
Although focused on HF, CORDIVA takes concomitant chronic conditions into account. All procedures are based on guidelines of European and German cardiological societies.

INCLUSION AND EXCLUSION CRITERIA

Patients are included either by the GP or specialist, the latter either during hospital stay or after discharge in an outpatient facility, or by the patient's health plan. Inclusion always requires a recent HF related hospitalization. The exclusion criteria encompass: age below 18 year, terminal renal failure, some mental disorders and attendants of nursing home.

CORDIVA WORKFLOW

CORDIVA IS AIMED AT EARLY DETECTION AND PREVENTION OF FURTHER AGGRAVATION



Strengthening of self-care by patient training

Patient education and training is provided by HF nurses via phone and print media. Today, about 70 nurses are working in one single service centre, which operates nation-wide. Care in several foreign languages is offered too. Depending on the patient's individual risk and personal resources, capacities and skills, one scheduled phone call is performed every 4 to 6 weeks.

Remote monitoring to detect worsening of disease

A remote monitoring of sign, symptoms and body weight is normally carried out daily. The decision whether or not remote monitoring will be established is based on the patient's individual risk. Data transfer is performed usually via GSM. An algorithm based data and data pattern analysis allows for detection of disease worsening early enough to intervene and to prevent hospital admission. The intervention is initiated by the HF nurses by contacting both patients and their GP.

IT integration into existing pathways

GPH has developed a software module, which is implemented in the office management software of about 75% of German GP practices. This module enables automatic screening for eligible patients and provides electronic forms for inclusion and follow-up and decision making support.

STRATIFICATION TO PERSONALIZE CARE

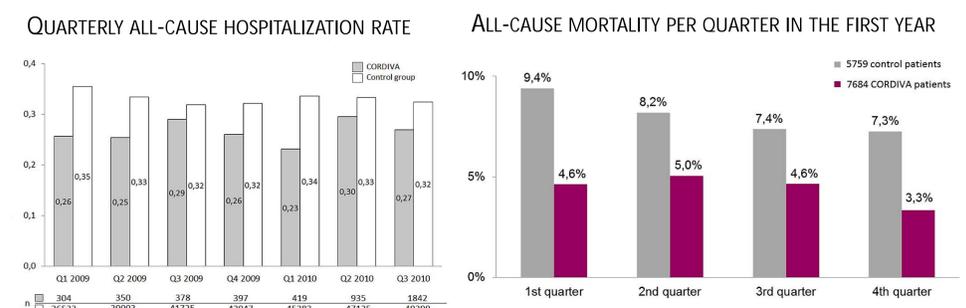
The programme is delivering personalized care by configuring individual health care pathways based on adaptive rule sets. Two-stage stratification is tailoring the delivery of care:

Clinical stratification to estimate the individual risk for hospitalization and death, which involves parameters such as current state of health, medical history and findings of diagnostic imaging procedures

Psycho-social stratification in order to reveal personal resources, which is based on an assessment of motivation, attitude and behaviour, coping, cognitive fitness, depression and anxiety

PRELIMINARY RESULTS

Repetitive evaluations of effectiveness were done together with the German health plans as basis for a performance related compensation. Based on elementary control, results indicate that CORDIVA may continuously reduce all cause hospitalization by up to 40%, almost halve mortality and decrease total health care cost by up to 20%.



PLANNED COMPREHENSIVE EVALUATION

In 2014, a comprehensive, scientific, retrospective evaluating of benefits and effectiveness of CORDIVA involving about 16.000 Bavarian programme participants since 2006 will take place. This collaborative effort shall also provide the basis for developing a framework for practical implementation and scientific publications. The project consortium consists of the

- Helmholtz Institut, Munich
- Ludwig-Maximilians-Universität, Munich
- AOK Bayern –Die Gesundheitskasse, Munich
- GPH, Munich

Compared with an untreated control group the programme effects will be estimated by accounting for a whole range of covariates using propensity score matching. The clinical evaluation is aiming to show effectiveness with respect to mortality, hospitalization rate, concomitant diseases, medication treatment, quality of life, programme acceptance and CORDIVA interventions. Moreover, a health economic evaluation will evaluate health care costs, cost components and cost drivers, and assess cost-effectiveness as well as cost-utility, the latter referring to Quality Adjusted Life Years as outcome parameter.

EUROPEAN ACTIVITIES

In May 2013, CORDIVA has started in Toulouse, which was initiated by the Toulouse University. In summer 2013, the programme was extended to Paris introducing biomarker (BNP) home monitoring. In both sites the setting of a randomized controlled trial was chosen.

SUMMARY

CORDIVA is an almost unique example of an practically implemented, self-sustaining eHealth programme supporting many thousands of patients, who suffer from HF. Constantly reviewed by its customers regarding its performance, CORDIVA's growing utilization shows that physicians and patients choose for this programme. However, an independent scientific evaluation will soon provide deeper insights into CORDIVA's effectiveness, cost-effectiveness, and the key parameter these are based on.