# Olomouc region, Czech republic: Telehealth service for patients with advanced heart failure

## Part 1: General Information

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| **Publication on EIP on AHA Portal** | Yes |
| **Copyright** | No |
| **Verification of the Good Practice** | Yes |
| **Evaluation of the Good Practice** | No |
| **Type of the Good Practice** | Good practice |

## Part 2: Description of the Good Practice

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| **Name of the Good Practice** | Telehealth service for patients with advanced heart failure |
| **Short name (Acronym)** | TCHF |
| **URL of the Good Practice** | http://www.ntmc.cz/?lang=en |
| **Geographical scope** | Regional level |
| **Country** | Czech republic |
| **Region(s) involved** | Olomouc region |
| **Status of the Good Practice** | On-going |
| **Stakeholders involved** | • Hospitals<br>• Specialised physicians<br>• National public authorities<br>• Nurses<br>• WHO |
| **Size of population covered** | 100-249 |
| Targeted audience | Irrelevant |

**Summary of the Good Practice**

The practice, performed by University Hospital Olomouc with regional activity, introduces specific remote monitoring of patients with Congestive heart failure, structural damage of myocardium and left chamber dysfunction through the deployment of telehealth services and enhances relevant medical protocols. This new practice is to detect as many patients with the given diagnoses as possible, deploy telehealth services for monitoring and improved treatment of these patients.

The telehealth service consists of telemonitoring with clinical protocol that is in line with the protocol used in a large EU project Unite4Health (www.united4health.eu) that focused on assessing the impact of innovative healthcare services in real conditions in 14 regions of

Europe. The practice adapted this generic protocol for the target group of patients (with advanced CHF) and for the regional conditions.

The practice enabled screening of common population in the Region with the disease; it provides tools for remote control of patients with advanced heart failure (NYHA class III-IV, it means patients that are markedly or severely limited during physical activity) on standard medical therapy (ESC guidelines), before and after heart transplantation. Further it covers population of patients with hemodynamic support (ventricular assist device - VAD) before orthotropic heart transplantation (OTS) or in long-term regimen. Until the service was introduced, there has not been method that would enable to collect relevant information about critical parameters development besides keeping the patient in hospital.

The practice requires only minimum organisational changes in the hospital; it's essential parts are under control of clinical staff (cardiologists and nurses) who make use of data (including weight, blood pressure, SpO2) received from patients at home. The ICT system used for the practice has also several features that enable bidirectional communication between the medical personnel and patient; including distant ordering of medicaments, which party fills the gap of non-existent e-prescription service in the country. Other features increase technical reliability of distant communication between patient ▫s smartphone (gateway) and healthcare personnel (nurse, cardiologist with access to telehealth portal).

There is clear relationship between initial disease detection in population - screening, followed by specific individualized therapy and management of the target group of ill in higher age and therefore the practice has positive impact to health conditions of targeted population. It is also expected that morbidity, mortality, and quality of life of the targeted patients with observed diagnoses will be improved. Inputs in international medical (cardiology) societies will also further improve position and prestige of EU medical expertise. As the issue of sustainability of the service is essential, the Good Practice management systematically negotiate with medical societies and national healthcare authorities to achieve reimbursement on national level and to upgrade standardized treatment protocols.

New jobs associated with telemonitoring services were created. New force is needed mostly for technical and management oriented tasks. With growing penetration of telemonitoring into the target population it is clear that especially an increase in newly detected patients with heart failure will require more medical personnel. However, the load of staff associated with inclusion a patient into the service is not significant. The practice demonstrated increase of the quality of care.

Essential elements of the practice can transferred as a whole to other regions in the CR or abroad. The practice is suitable for hospitals/centres treating advanced CHF.

**Key words:** cardiology, heart failure, VAD, telehealth, ICT

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| **Good practice being part of the larger programme**<br><br>Yes.<br><br>This practice is targeted to improve care of cardiac in the Region. This service is one of the 2 original practices employing ICT in distant communication between medical staff and patients with chronic diseases in University hospital Olomouc. An extended set of practices is under development as part of hospital program in 2016. A common ICT system is to be used for a number practices comprising several chronic diseases (currently in mid 2016 it is planned to cover more services for than 5 departments in the hospital). The practices reflect current status of eHealth in the CR (mostly underdeveloped) and concentrate on benefits in medical domain. |
| **Challenges / problems addressed by the good practice**<br><br>Training of medical personnel, preparation of the infrastructure, such as the ICT system and its features reflecting needs, pathways for patients including education, methodology for stratification of patients (selection for the service), financing – investment and operation, strategy for negotiation of sustainability (ongoing with stakeholders in the CR in 2016). |
| **Importance of the challenges / problems before starting to implement good practice**<br><br>Unexpected deterioration of status of patients with advanced CHF that could not be detected in time. Limited number of medical personnel that could cope with increasing number of patients. |
| **Environment before the good practice was implemented**<br><br>Classical clinical care however advanced but without possibility to process data about status of patients located at home. Hospitalisation of these patients was the only option. |
| **Key innovative elements of the good practice and how the good practice improved situation compared to previous practice**<br><br>Patients with CHF can be discharged from the hospital and more regular information about their vital sings in available to the medical staffs that care. If a decision is to be made the patients is called to come to the hospital as the practice introduces only informative elements and therefore medical protocols are not compromised. The practice enables to reduce routine status checks for which the patients must have stayed in or frequently to come to the hospital. Patients stay in the services for period of time as necessary (e.g. 1 month) and then the equipment can be transferred to another patient. |

## Part 3: Transferability of the Good Practice

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| **Cost-effectiveness of the good practice (including all kind of costs** | Equal costs, improved outcomes |

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| **and outcomes such as better health, quality of life or other resources)** | |
| **Resources required for the deployment of the good practice (personnel, equipment, facilities, ICT and other resources required.**<br><br>Personnel: nurses + cardiologists (training), 1 telehealth engineer, office room for dedicated ICT system and education of patients, HW and application SW (small server – in cloud), Bluetooth enabled smartphones with SW, devices (scale, BP meter, oximeter), telecommunications (2G, 3G, 4G mobile). Negotiations of the practice with the aim to achieve the service sustainability take long time and require adequate skill. | |
| **Total budget of the Good Practice** | €10.000 -€ 99,999 |
| **Source of funding** | Other (European & national funding) |
| **The main actions that have to be done to deploy the Good Practice**<br><br>Initial training of medical staff, defining professional roles in the practice in the hospital, modification of clinical protocols and workflow, putting the ICT system in operation. | |
| **Issues during the implementation of the Good Practice**<br><br>Ensuring financial resources for the service after project resources were exhausted.<br>Some patients need more intensive education. The technical feature of the telehealth system enabling distant configuration of patient □s smartphones saves significant effort, resources and time to the support. Not all patients can enrol, mostly due to their cognitive impairments. | |
| **Additional resources required to scale up Good Practice**<br><br>Yes.<br><br>Inclusion of each new patient requires appropriate investment in the equipment if the number of available (and recyclable) devices is reached. | |
| **Basis to support sustainability of the Good Practice**<br><br>Financial resources and functional HW, SW. | |
| **Evidence to observe the Good Practice**<br><br>A visit to an implementation site. | |

## Part 4: Viability assessment of the Good Practice

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| **Time needed to deploy the Good Practice**<br><br>Less than a year. |
| **Investment per citizens / patient / client in terms of financial resources**<br><br>Between €1.000 – €5.000 EUR per targeted citizen / patient. |

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| Cost of equipment of the patient, share on the cost of the system and its operation, telecommunications. |
| **Evidence behind the Good Practice**<br><br>Documented evidence. Evidence is based on systematic qualitative and quantitative studies.<br><br>Evidence behind the practice was part of results of our deployment site in Unite4Health project. Clinical evidence is based on analysis of evidence provided by based medicine resources (were also bases of Unite4Health project). Evaluation of the practice was completed by methodology MAST – Model for Assessment of Telemedicine. |
| **Maturity of the Good Practice**<br><br>There is evidence that the practice is economically viable and brings benefits to the target group. Further research and development is needed in order to achieve market impact and for the practice to become routine use.<br><br>The practice is beneficial to patients, the hospital and even the healthcare system. However, its economic viability is still subject of negotiation (status August 2016) with appropriate authorities. The negotiations are ongoing on several levels including Ministry of Health of the CR. |
| **Estimated time of impact of the Good Practice**<br><br>Long term and sustainable impact – e.g. a long time after the pilot project ended and routine day-to-day operation began. |
| **Impact observed**<br><br>Less hospital re-admission (economic).<br><br>The impact of the intervention was in increased quality of care of the patients, namely due early intervention thanks to the practice that reduced deterioration of the patient's condition. Reduction of re-hospitalization is approx. 40%. Reduction of number of patients' ▫ visits in the hospital. The patients better adhere to medication and have better access to healthcare professionals. |
| **Transferability of the Good Practice**<br><br>The innovative practice has been transferred within the same region.<br><br>The practice has been transferred also to other region in the CR and is performed in a reference health institute in Prague (IKEM). Scaling up to other hospitals can follow, however the team in NTMC concentrates on organisational aspects of such telehealth service, especially economic conditions to ensure sustainability. |

## Part 5: Your organisation

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| **Name of the organisation** | University Hospital Olomouc |
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| **Type of organisation** | Hospitals |
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