

## 2 stories within telemedicine

- I. The Danish Case of COPD
- II. Telemedicine in the handling of patients with chronic wounds foot and leg ulcers

### I. The Danish Case of COPD (Chronic Obstructive Pulmonary Disease)

In Denmark, patients with COPD spend 4-6 weeks in hospital each year. The average time per admission is 6.8 days. COPD patients take up every fourth or fifth bed on average in the medical wards at the Danish hospitals. Former studies have proven that at least 1/3 of these patients can be treated by assisted home care (hospitalisation at home). All in all, there is a need to find new solutions as an alternative to or support to the traditional care pathway.

#### Description

Based on this knowledge, the project idea is to use a telemedicine solution that will make it possible to take the patients out of the hospital beds and give the clinicians the same the possibility to get the same information as if the patients were at the hospital. To be able to do this, it is necessary to design a “patient briefcase”, which will be a communication centre in the patients’ home. The set-up consists of a portable ICT-unit, which makes it possible to take care of patients in their own home. The ICT equipment allows live images/sound as well as data measurements from medical equipment (e.g. spirometry – lung functionality - and devices to measure oxygen saturation) to be simultaneously transferred to the hospital where the medical professional can evaluate and guide the patient as if the patient was present at the hospital. The set-up at the hospital consists of an electronic medical record, communication-unit and a screen, where test-results are shown.

As the patient group that is targeted is old fragile elderly without any IT knowledge, it is very important that the solution is absolutely simple and easy to use.

There are three players involved in the set-up in: the patients, the hospital (Medical ward and Telemedicine Unit) and a private IT company.

The primary patient group that can be included in the service are patients admitted with COPD in exacerbation. These will be clinically evaluated in the first 24-36 hours. If they fulfil a set of defined criteria, they will be discharged no later than 48 hours after admission. At home, they will be

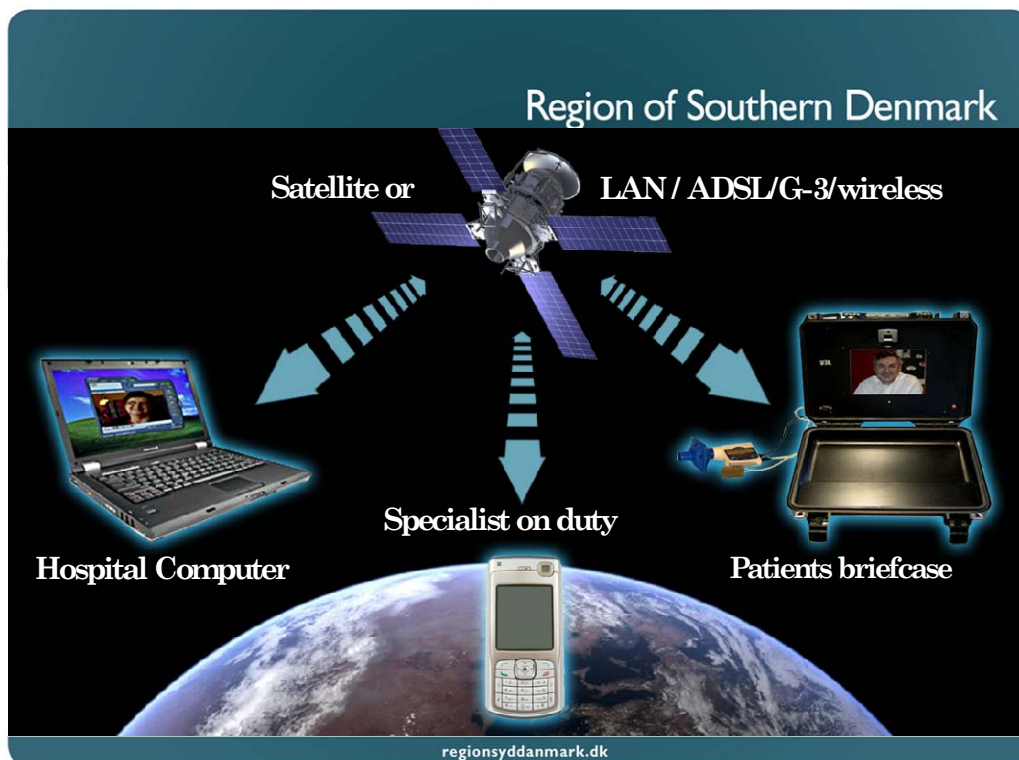
instructed in the use of the briefcase and its medical devices, and agreements on contacts to the hospital will be made (“rounds at home”). Aside the patient is instructed in how to use the emergency-button on the brief-case.

Upon contact with the hospital, vital measurements are made, adjustment of medication agreed upon and time for next contact is made.

The expected outcomes of the project are

1. The solution can be used by nearly all patients
2. About 30% of all COPD patients with exacerbation will be discharged within 48 hours
3. The technical solution will run without any problems 24/7
4. Readmission within 4 weeks will be less than 10% compared to 25 % in regular setup.
5. There will be a significant improvement in the patients' quality of life.
6. The solution will improve the hospitals' possibilities to attract qualified staff
7. The setup can be extended to cover the whole region of Southern Denmark so that a “call centre” can take care of all COPD patients in the region.

**The set-up is illustrated below**



## **II. Telemedicine in the handling of patients with chronic wounds foot and leg ulcers**

Leg and foot ulcers are an age-related illness. The average age of the patients is 74 years. Leg and foot ulcers are usually caused by diabetes, venous and arterial disease. Approx 50% of all major amputations are preceded by a foot ulcer. Due to the demographic age challenges in Europe, this area will be more and more important in the future. Patients with chronic diabetic ulcers are characterized by being elderly, often isolated socially and troubled with pain from the ulcer. The medical field is furthermore not prioritizing ulcer care very high, which in itself prolongs ulcer treatment and thereby also healing.

All in all there is a need to find new solutions as an alternative to or support to the traditional care pathway.

### **Description**

Based on this knowledge, the project idea is to use a telemedicine solution that would enable the patients to receive faster and more autonomous care. The solution should enable the patients to receive care and medical evaluation in their own home, while giving the medical specialist or GP the same possibility to get the same information that they would receive under normal circumstances.

To do this, it is necessary to develop an IT system that can communicate cross-sectional in the healthcare, as well as creating a clinical database on patients with chronic wounds.

The telemedicine ulcer-evaluation should be based on a secure transfer of digital images between videophones or PDAs (standard articles) and a web based ulcer journal developed for this particular purpose. Through the transfer of images, the assigned medical specialist can assess the images, and thereby the ulcers, without consulting the patient in real life settings e.g. at the hospital. The solution thereby releases manpower due to the fact that the patients no longer have to go through the medical system every time the patients shall have assessed their ulcer. Furthermore, the solution increases the patient's quality of life because it speeds up healing, it enables the patient to have more independence and freedom. The patient thereby achieves more autonomy.

As the patient group that is targeted is fragile elderly without any ICT knowledge, it is very important that the solution is handled by a home nurse or the like. The solution should not be handled by the elderly, but if interested they can have access to their personal records.

### **The intention of the project is quantitative and qualitative**

Quantitative:

- Reduction of the number of amputations
- Reduction of the number of out-patient contacts for the purpose of control and adjustments of the treatment
- Reduced transportation costs
- Reduced time consumption by the homecare nurse

Qualitative:

- Faster and more secure diagnosis
- Optimized course of treatment, less workflows, better differentiation of the tasks and development of the patients' and nursing staffs' competences
- No waiting time and reduced transportation time

- Reduced dependency on aids due to less amputations

### The main players that will be involved in the setup

1. The public care provider, i.e. the nursing staff or home nurse, handles the social care of the fragile patients
2. The public health care system selects the patients assessed suitable to the solution's possibilities. The medical staff thereafter takes over the medical treatment and supervision of the patient in collaboration with the nursing staff or home nurse.

### Working Procedure

A nurse in the primary health care sector consults a patient with a chronic ulcer. Data is recorded, in some cases using an electronic sheet of paper and an electronic pen. A photo is taken and all data is transmitted by the mobile internet to the database, and entered to that particular patient's particular leg. An SMS on the doctors mobile indicates that new information has been entered. In some cases, the SMS is supplemented by: "Please call me".

The doctor can go to any computer, as the system is web based, and evaluate the data, phone the ulcer care nurse, still being in the home of the patient and a decision on treatment is made. For each patient a task force is created – wound care nurse, doctor, orthopaedist, and secretary and out-patient clinic.

The setup is illustrated below:

