



THE DANISH GOVERNMENT
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DANISH REGIONS
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NATIONAL ACTION PLAN FOR
DISSEMINATION OF TELEMEDICINE
- IN BRIEF

TELEMEDICINE - A KEY TO HEALTH SERVICES OF THE FUTURE

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TELEMEDICINE – A KEY TO HEALTH SERVICES OF THE FUTURE

Telemedicine is one of the keys that open the door to health services of the future. Denmark is one of the countries in the world that have come furthest in using telemedicine to meet the challenges of demography and economy that Denmark and other countries will face in the coming years.

In recent years telemedicine solutions have been tested in pilot projects in different places in Denmark. The projects show that telemedicine can be utilised more efficiently to renew and streamline public service, treatment and care. At the same time, the technologies make it possible to increase the quality of treatment as well as patient satisfaction.

In drawing up the national action plan, the Danish government, municipalities and regions wish to speed up the dissemination of telemedicine solutions that we know work. The first steps will be taken already during the summer 2012.

A total of DKK 80 million (approx. 11 million EUR) has been allocated to completely or partially finance the initiatives of the action plan. In addition, regions and municipalities are making a significant contribution. The action plan is an initiative in the Danish eGovernment Strategy 2011-2015. The results of the plan will form part of the work of a future digital welfare reform.

THE **THREE MAIN AREAS** OF THE ACTION PLAN

STARTING POINT: GREAT CHALLENGES – NEW POSSIBILITIES

New kinds of treatment, an aging population and an increasing number of Danes with chronic diseases put pressure on resources.

New telemedicine technology and new work flows can equip the health services – hospitals, municipal health care and general practitioners – to perform tasks more efficiently in the future. But this requires that we gain experience of well-documented telemedicine solutions operating on a large scale involving several regions and municipalities or including a large number of patients.

BETTER FRAMEWORK FOR TELEMEDICINE

A better framework must be created for telemedicine.

It should be possible for the authorities to gather relevant knowledge and results that have been achieved using specific telemedicine solutions. New joint concepts for assessing telemedicine projects and their results are to help the authorities to apply well-functioning, efficient solutions more quickly. In addition, common national standards for health IT are to ensure that new telemedicine solutions are developed in a such a way that the systems can work together across hospitals, municipal health care and general practitioners.

PATHS TO DISSEMINATION

We must mature telemedicine solutions with stronger assessments and disseminate the best solutions on a large scale and across sectors.

Five specific initiatives (see the graphics) will therefore test and disseminate concrete telemedicine solutions on a larger or smaller scale. It will be possible to establish goals for the continued dissemination of telemedicine solutions on the basis of the projects' results.





**STARTING POINT:
GREAT CHALLENGES
– NEW POSSIBILITIES**

- Challenges for the health services
- Possibilities with telemedicine

**BETTER FRAMEWORK
FOR TELEMEDICINE**

- Reference architectures and standards
- Joint concepts for assessment
- Overview of telemedicine technologies and solutions in use

PATHS TO DISSEMINATION

- Clinically integrated home monitoring
- Home monitoring for COPD patients
- Telepsychiatry
- Internet psychiatry
- National telemedical assessment of ulcers

STARTING POINT: GREAT **CHALLENGES** FOR THE HEALTH SERVICES

We must supply health services in a smarter way than we do today. Large generations leave the labour market these years and are being replaced by smaller generations of young people. Fewer people will have to take care of more. This also means that there will be fewer to pay for the hospitals, elderly care, expenditure for general practitioners etc.

As the risk of contracting a chronic disease increases with age, a rising number of elderly people means that the number of people with chronic diseases will grow. It is estimated that approximately 1.8 million of a Danish population of 5.5 million have one or more chronic diseases such as diabetes or chronic obstructive pulmonary disease (COPD). This increases the demand for public health services, among other things, and requires innovative thinking in terms of solutions in order to make better use of the many resources already allocated to health services today.

The action plan supports and disseminates telemedicine initiatives that improve productivity and provides a direction for the ongoing modernisation of the health services.

EXPERIENCE WITH LARGE-SCALE SOLUTIONS

Experience from pilot projects indicates that tasks can be performed more efficiently and at a lower cost by the use of telemedicine. But there is a lack of systematically collected and documented experience of telemedicine large-scale solutions that have been in operation over a longer period of time. This is not least because telemedicine-supported treatment often challenges existing work flows and ways of organising the tasks.

For these reasons we are now launching five specific telemedicine initiatives: clinically integrated home monitoring; home monitoring for COPD patients; telepsychiatry; internet psychiatry; and national telemedical assessment of ulcers (see pages 10-14).

THE OBJECTIVES OF THE FIVE INITIATIVES

The initiatives are to ensure:

1. that telemedicine solutions undergo large-scale testing (i.e. on many patients, with the involvement of a large number of personnel and across the sectors). In the long run this is to contribute to the national dissemination of telemedicine solutions.
2. that telemedicine is tested in areas in the healthcare service where there is not much documented experience of this

method of treatment. Telemedicine solutions are to be matured by means of stronger assessments.

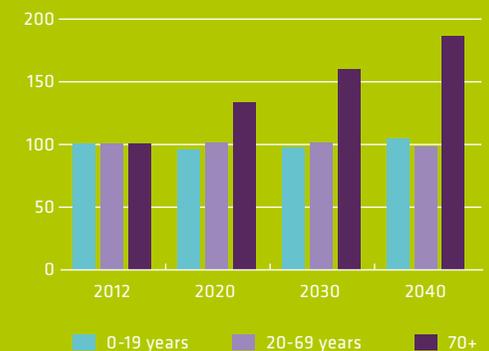
The initiatives will provide knowledge of the effects telemedicine has on the results of treatment, the quality of the service, work flows, economic incentive structures as well as shifts in tasks and burdens between regions and municipalities. At the same time, the initiatives should reveal and solve any legal and technical challenges that telemedicine treatment could cause.

**FIGURE 1:
POPULATION PROJECTION 2015-2040**

The graph illustrates the projected population indexed up to 2040 (2012 = index 100). The columns show that the youngest group of the population and the part of the population of working age will remain at approximately the same level between 2012 and 2040. At the same time, there will be a 84 per cent rise in the older parts of the population.

Source: Statistics Denmark

INDEX 2012



NEW POSSIBILITIES WITH TELEMEDICINE

Potentially, great gains can be obtained by utilising the digital possibilities for performing core tasks in the healthcare system in new and smarter ways.

High-quality treatment does not necessarily require a physical meeting. In many cases telemedicine solutions such as videoconferencing, digital exchange of images and monitoring patients in their own homes can give the same or a higher quality of treatment and quality of life for fewer resources.

Well-functioning telemedicine solutions benefit the patients, who can remain in their own homes without having to visit the hospital for frequent but often simple check-ups. At the same time this is expected to reduce costs.

WELL-PLANNED TELEMEDICINE SOLUTIONS CAN GIVE:

Improved and more coherent patient care

Closer coordination between the general practitioner, the municipal home care system and the hospitals results in increased quality and safety of treatment.

More individually planned treatment and self-reliant patients

Patients gain insight into their own illnesses and better opportunities to participate actively in their own treatment.

Increasing professional competencies across sectors

New ways of performing tasks and professional sparring with experts in other parts of the health service strengthens the competence of the personnel and makes their jobs more interesting.

Financial gains in municipalities and regions

More flexible and efficient ways of organising the work in the healthcare system result in fewer people being hospitalised, a reduced number of outpatient check-ups and fewer home care visits.

Denmark has already established a national infrastructure for interpretation via videoconferencing in the public health service, which can be used by all regions and municipalities. The initiatives of the action plan will take their starting point among other things in the technical and organisational solutions that have already been tested and established with a positive result.



ESTABLISHING A **BETTER FRAMEWORK** FOR TELEMEDICINE

A stronger framework must be established if telemedicine solutions are to be disseminated at a faster pace. The National Board of e-Health under the Ministry of Health has the overall responsibility for creating a better framework for telemedicine in Denmark in the coming years. This includes:

REFERENCE ARCHITECTURES AND STANDARDS

Common national reference architectures and standards for health IT that support the application of telemedicine solutions.

– Common standards are a prerequisite for the regions, municipalities, and the general practitioners to efficiently collect and share data. This will also ensure that new telemedicine solutions are developed in such a way as to be technically compatible with existing IT systems at the hospitals, in municipalities and among general practitioners. The reference architectures are being developed in cooperation with Continua Health Alliance, an international non-profit open industry organisation.

The work in Denmark will consequently build on and contribute to the development of international cooperation on coherence and standards in the field.

COMMON ASSESSMENT MODELS

More systematic registration of the clinical, organisational and economic impact of telemedicine provides a better frame of reference for assessing technologies. Therefore, a new graduated model for assessing the impact of telemedicine concepts and solutions will be created.

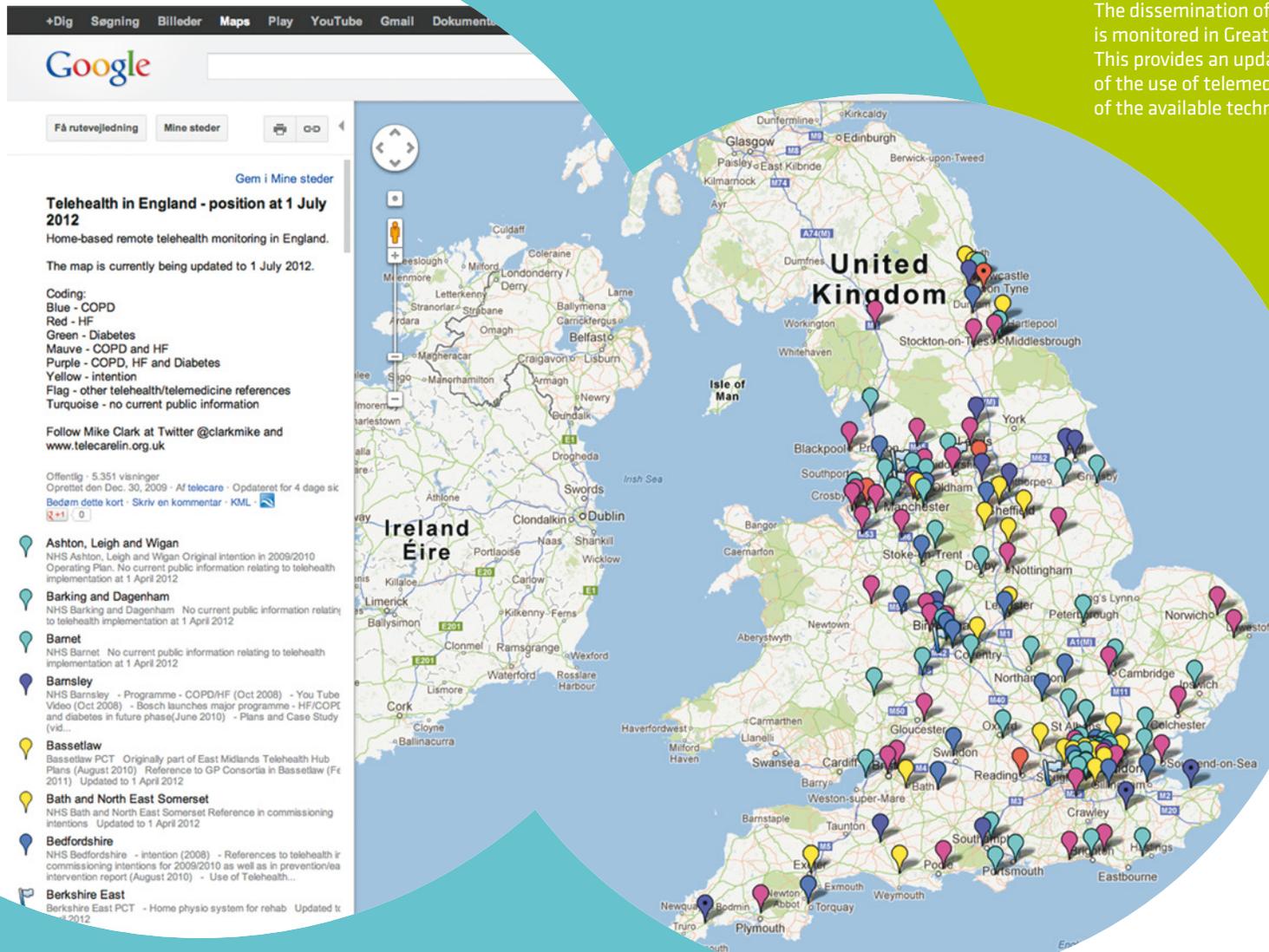
– As a main rule, if the telemedicine solution does not significantly alter treatment processes and practice, the solution will merely undergo the same technology assessment as other medical technologies. If the changes are significant, the solution must undergo a more comprehensive assessment. The graduated model is to be acknowledged and utilised by relevant actors in the health service.

OVERVIEW OF TELEMEDICINE SOLUTIONS

A comprehensive, systematic overview of telemedicine technologies in use in Denmark and where they are utilised will be created. An annual, updated overview of trends in technology and of the products successfully applied in other parts of the world will be created.

– This will enable organisations wishing to make use of telemedicine to find other actors with similar projects and thus make a quicker start by reusing already established solutions.





The dissemination of "telehealth" is monitored in Great Britain. This provides an updated overview of the use of telemedicine and of the available technologies.

CLINICALLY INTEGRATED HOME MONITORING

2,000 patients take part in Denmark's largest cross-sector home monitoring project to date, which runs 2012-14. Patients with COPD, diabetes or inflammatory bowel disease as well as pregnant women with and without complications will be monitored in their own homes by the use of telemedicine. The objective of this ambitious venture is to provide documented experience of utilising a common technical solution for home monitoring of different groups of patients and to ensure coherent treatment procedures across the sectors in the health service.

COHERENT PATIENT CARE REQUIRES COOPERATION

The project's five patient groups have many contacts with the health service and if necessary the municipal care system in relation to treatment, check-ups and rehabilitation. This requires frequent communication and coordination between the patient, the hospital, the general practitioner and the municipality.

The patients in the project are fitted with IT equipment in their homes, making it possible for them to measure and register relevant data. For example, pregnant women measure and register blood pressure, weight and

protein in their urine. In this way, they can avoid hospitalization or frequent check-ups at the hospital.

The registered data and the patients' treatment schedules are collected in a joint database, which supplies data to health professionals from all sectors in their own IT systems. The health professionals keep an eye on the information and contact the patients if necessary – for example if their medicine has to be changed. The system also contains the possibility of video consultations between patients and health personnel.

The patients are supported during treatment in their own homes. This results in increased patient security and prevents unnecessary hospitalization and outpatient appointments. The patients can also see their treatment plans, find relevant information material, and book appointments through the official Danish health website sundhed.dk. This is intended to enhance their possibility of taking care of their own health.

TOWARDS A NATIONAL INFRA-STRUCTURE FOR TELEMEDICINE

To the extent possible, the technical solution will be integrated with the existing IT



infrastructure in the health area, such as electronic medical records etc. This marks the start of a gradual further development of the national IT infrastructure for the support and dissemination of telemedicine treatment and virtual consultations for several patient groups.

In addition, the initiative contributes to the work of the National Board of e-Health by establishing national standards and reference architectures for telemedicine (see page 8). And it will be possible to disseminate the technologies throughout the country in the longer term.

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On the existing basis it has been estimated that nationwide dissemination to all patient groups can reduce public health costs by approximately DKK 800 million (EUR 110 million).

HOME MONITORING FOR COPD PATIENTS IN THE NORTH DENMARK REGION

Over the next two years 1,440 patients from northern Jutland with severe or very severe COPD are to be treated through telemedicine. In doing so, the North Denmark region, for the first time in Denmark, is introducing home monitoring in daily operations throughout the region. This means that 11 municipalities, all general practitioners and all relevant patients are included. Important new knowledge will be obtained about large-scale home monitoring operations making it possible to disseminate the solution to the entire country and to other groups of patients suffering from a chronic disease.

KNOWLEDGE ABOUT HEALTH INVOLVES THE PATIENT

Patients with severe or very severe COPD have many contacts with the health service and the municipal home care system in relation to treatment, check-ups and rehabilitation. In general, they are hospitalised many times during the course of a year but it is difficult for them to participate in the subsequent rehabilitation. This makes it hard for the patients to manage their illness, maintain their physical level of functioning and notice deterioration of their health in time.

COPD patients in Northern Jutland will receive IT equipment in their homes to support care, treatment and active patient involvement. The patients will carry out daily or weekly health measurements – for example of their lung capacity and blood oxygen levels. This will give both the patients themselves and health professionals knowledge about the development of the disease. The information will be collected in a joint database that all relevant health professionals in hospitals, at the general practitioners and in the municipality have access to through their local IT systems (for example electronic medical records etc.).

Generally, it is the responsibility of the municipality to monitor the data received and involve the hospital when necessary. Both patients and their relatives can access the patient's data via sundhed.dk.

REUSE AND NEW DEVELOPMENT OF IT SOLUTIONS

The project makes use of the same technical infrastructure and assessment concepts as the project 'Clinically integrated home monitoring' (see page 10). This will provide more experience with the technical solution (existing national dataset, infrastructure

and og standards). The project will also yield knowledge about the advantages and disadvantages of home monitoring of all patients in a region's group of chronic patients.

The project also develops new generic IT solutions that can potentially be used for patients with other chronic diseases. In addition, new organisational models, new work flows and a new division of labour and responsibilities is being established, which determines the public body responsible for acting at a given point in time.

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The solution is expected to be fully implemented in the North Denmark region in 2016, and the region expects to be in a position to reduce health expenditure by approximately DKK 32 million (approx. 4.3 mio. EUR) a year – with the same or higher patient satisfaction. If the evaluation of the project is positive, it will be possible to disseminate the solution to the rest of Denmark.



DEMONSTRATION AND DISSEMINATION OF **TELEPSYCHIATRY**

Video conferencing between psychiatric health care professionals is to provide better courses of treatment for adult psychiatric patients. It is estimated that at any given time, 10-20 percent of the Danish population suffer from mental illnesses.

Organisationally, psychiatry in Denmark is divided between the regions and the municipalities. The regions provide psychiatric treatment (including medication and therapeutic conversations) in both specialist departments at the hospitals and in district psychiatry departments outside the hospitals, where patients are treated on an outpatient basis (i.e. without hospitalisation). The municipalities provide social psychiatric services, which e.g. take place in group homes (where the patient lives when he or she is not hospitalised) and in drop-in centres for the mentally disabled.

In the treatment of patients with mental disease, focus is to a rising extent placed on treating the patient in the patient's immediate environment, as well as providing a more specialised treatment, i.e. targeted at the different mental diseases. While this provides the patient with the best treatment, at the same time it creates a lack of specialists as the distance between the specialised

hospital departments and the more locally situated psychiatric services can be great.

VIDEO CONFERENCING AND TELEPSYCHIATRIC COOPERATION ACROSS SECTORS

In the autumn of 2012, video conferencing and virtual cooperation between psychiatry departments focused on the treatment of patients at hospitals and the district psychiatry departments in all five regions will be introduced. This means that specialists such as psychiatrists can use their time more efficiently and avoid transportation. In addition, video conferencing can contribute to services being moved from e.g. highly specialised hospital departments to less specialised wards and social psychiatric care in the municipalities. This reduces costs for society.

Video conferencing will be used for the daily morning meetings, where health professionals from the hospital and district psychiatry discuss all joint patients, and for monthly department conferences on joint patients. Video conferencing is also to be used to allow nurses from the district psychiatry to have regular contact with a hospitalised

patient without having to spend a lot of time on transportation. In the future, district psychiatry personnel will also participate virtually when a hospital department holds discharge conferences with a psychiatric patient.

Video conferencing can strengthen cooperation between the regional and municipal services. Therefore, hospitalised patients in adult psychiatric hospital departments and health care professionals at the municipal group homes will test video conferencing in certain parts of the country.

The testing will be carried out in five regions and selected group homes. It will provide important information of virtual cooperation across sectors that have not yet used telemedicine on a large scale.

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The economic impact of the initiative will be time saved on transport when health care professionals from the district psychiatry units conduct discharge conferences via video with the psychiatric departments rather than by physical presence at the department.



DEMONSTRATION OF INTERNET PSYCHIATRY

From autumn 2012, the Region of Southern Denmark will test whether psychiatric treatment through an online IT program can help patients suffering from depression. It is estimated that approximately 250,000 Danes suffer from depression, 30 percent of whom do not receive any treatment. The regions' expenditure on treating patients with mild to moderate depression has significantly increased in just a few years. Simultaneously, there is a lack of specialists in psychiatry, which is expected to increase in the years to come.

Early treatment for depression benefits both the patients and the economy. It increases the chances of recovery and results in a higher quality of life. At the same time it reduces expenditure on sick leave, ensures retention on the labour market and prevents that the patient's mental illness leads to excessive use of other health services.

POSITIVE INTERNATIONAL EXPERIENCE

Sweden and Great Britain have positive experience with internet psychiatry, i.e. treatment using an electronic, specially-developed internet program. Preliminary results show that internet psychiatry yields treatment results that are just as good for patients with depression and anxiety as traditional face-to-face therapy.

Therefore, internet psychiatry for patients with mild to moderate depression is now to be tested for the first time in Denmark in the course of two years. The project tests an organisational set-up where the patient him- or herself looks for and signs up for treatment. The general practitioner can also refer patients to internet-based psychiatric treatment.

The patients undergo a screening test, which can be found on the treatment service's webpage in a secure environment (also via sundhed.dk). A psychiatric specialist from the university hospital in Odense scrutinises the screening test to ensure that the patient meets the criteria for participating. Afterwards, treatment can be initiated immediately and quickly.

TREATMENT FOR MORE PATIENTS USING INTERNET PSYCHIATRY

The treatment is based on cognitive behavioural therapy and takes approximately 10-12 weeks. During the course of treatment the patient is supported by a psychiatrist through e-mail. If necessary, the treatment can be supplemented with medication. A concluding interview is conducted when the course of treatment is finished.

The treatment can take place in a safe environment in the patient's own home and when it suits the patient. Experience has shown that the internet-based form of treatment thus reaches a group of patients who would either not have received treatment or would have entered treatment too late.

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Using internet psychiatry, as many as four times more patients can be treated as in conventional treatment – and at the same cost.



DISSEMINATION OF TELEMEDICAL **ASSESSMENT OF ULCERS** TO ALL REGIONS AND MUNICIPALITIES



35-40,000 people in Denmark are estimated to have ulcers on their feet or legs as a consequence of diabetes or reduced vein function. The ulcers heal slowly and there is a risk of grave complications that in the worst case can lead to amputation. Ulcers often need several treatments before healing, among other things because the patient's underlying disease does not disappear.

On 1 September 2012, Denmark's first nation-wide telemedicine project ever will start: telemedical assessment of ulcers. By using telemedicine, the municipal home care system together with the doctors at the hospital will be able to treat patients' ulcers more efficiently and with greater patient satisfaction.

TELEMEDICINE BENEFITS THE PATIENT AND SAVES RESOURCES

When the home care nurse visits the patient, she takes a photo of the ulcer with her mobile phone. She forwards the image to a web-based ulcer record, and then enters all her observations on the ulcer on her tablet PC – size, infection etc. – into the record.

A doctor or specialised nurse at the hospital will examine the image and the notes in the record and write a reply, for example with new instructions for treatment or new medication. The patient can also access his or her own record and monitor development in the treatment – and, moreover, will not have to interrupt everyday life to attend the hospital for treatment.

With telemedicine the home nurse gets to confer with an ulcer expert – and she gradually becomes more skilled. The ulcers heal faster when the quality of treatment improves. This means fewer visits from the municipal nurses and less expenditure on transporting fragile patients to and from the hospital. Specialists at the hospitals save time when they only have to attend to patients with the most complicated ulcers.

NEW ROLES ACROSS THE SECTORS

The technology supports and improves cross-sector cooperation between municipal nursing and regional ulcer treatment at the hospitals. The treatment does not change, only the way it is delivered.

The roles are new and competence has been shifted. The project exemplifies that if providing better treatment for fewer resources is to succeed, the parties involved – as in this case – must agree on new work procedures and ways of cooperating.

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The solution will be fully implemented throughout the country in 2017 – i.e. in all regions and municipalities and for all relevant patients. Preliminary assessments show that the health service will save more than DKK 300 million (EUR 40 million) a year by using telemedical assessment of ulcers. In terms of these assessments, the municipalities can look forward to saving an annual total of DKK 250 million (EUR 34 million), while the regions will save DKK 45 million (EUR 6 million) a year.

FOR MORE INFORMATION

You can read more about the national action plan for dissemination of telemedicine here:

www.digst.dk

www.sum.dk

www.regioner.dk

www.kl.dk

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