Healthy COMMUNICATION at the international level

At the national level, expanded electronic communication between the parties in the health service has long shown its value. This applies for instance to the area of telemedicine, where a large number of projects have demonstrated the opportunities that direct exchange of images, text and sound provides for on-line healthcare cooperation.

Some of the most important benefits consist in a rise in the quality of treatment and better utilisation of resources. At the same time, the new communication technology helps remove the barriers that geography can put in the way of patient treatment. The healthcare expert is no longer any further away than the nearest PC with a network connection. The necessary specialist knowledge is available where it is needed – without the patient having to be moved to receive the best treatment.

The idea behind the ciTTis project is to make use of positive national experience at the international level. Healthcare professionals in one country are to be able to draw easily and quickly on the knowledge that other experts in the network possess. The patient is to be given the best possible treatment provided in the most efficient way possible, regardless of whether the situation necessitates crossing national borders. If it becomes necessary to transfer the patient, this is to be backed up by flexible and reliable communication of patient data.

In the ciTTis project, hospitals in four regions on either side of the Danish-German border have joined forces to gain experience from international telemedicine. A service which makes it clear which expert resources are available at any given time is being developed and tested under the project. In addition, a cooperation platform, a Collaboration IT-Service, is being established for use in flexible telemedicine collaboration. An important element in the project is the organisational development, which is to ensure that the project partners are all able to benefit from the new opportunities for cooperation.

The project focuses on both technological and organisational development. The greatest challenge is purely organisational, while the communication solutions from a purely technical point of view primarily necessitate adaptation to current conditions.

At the same time, the project intends to promote commercial IT development within the four regions.

Patients:

Equal access to the best and fastest treatment

The health service is becoming increasingly specialised. Highly specialised knowledge is possessed by a relatively small number of people, and in many ways technological developments also support the centralisation of treatment facilities. At the same time there is a great need to achieve effective utilisation of resources in the health service. These trends have to harmonise with the wish to give all patients equal access to the quickest and best treatment. Part of the solution, in popular terms, is to move knowledge, so that there is expert knowledge where is needed, or to move the patient and patient data to the place where the treatment is to take place. Whatever the circumstances, this involves communication, and in this context, advanced information technology offers excellent opportunities.

Healthcare professionals:

Quality and development through cooperation

Healthcare experts acquire their continuing training to a great extent through collaboration in their daily work with colleagues in the same or related specialities. Previously, this continuing training in practice was almost synonymous with collaboration with colleagues in the same department and the same hospital. For the same reason, there has been a clear trend towards specialists looking for special units with a high scientific level. The new information technology provides an opportunity, in popular terms, to break down the barriers in healthcare cooperation. As a healthcare professional it is possible to look for sparring partners regardless of distance and national boundaries. This strengthens individual development of qualifications and raises the quality of the work done.
Four parties, one project
Six project participants from four regions are involved in ciTTis. These are South Jutland County and Region Schleswig, represented by the hospitals DIAKO and Malteser Krankenhaus St. Franziskus-Hospital in Flensburg, as well as County of Funen, represented by the Danish Centre for Health Telematics and Odense University Hospital and the Technologie-Region K.E.R.N., represented by Klinik für Diagnostische Radiologie am Universitätsklinikum Schleswig-Holstein in Kiel. The project has received assistance under the EU’s Interreg IIIA, both for the regional cooperation between County of Funen and the Technologie-Region K.E.R.N. and for the cooperation between South Jutland County and Region Schleswig. The Interreg assistance finances 50 per cent of the project budget. The remaining 50 per cent is funded by the participants.

**ciTTis timetable**

<table>
<thead>
<tr>
<th>Project</th>
<th>2002</th>
<th>2003</th>
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<th>2005</th>
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<tr>
<td>1. Project management</td>
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<td>2. Analysis of technical conditions</td>
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<td>3. Recommendations, guidelines and support</td>
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<td>4. Procedural analysis</td>
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<td>5. Development of new procedures</td>
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<td>6. Software development</td>
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<td>7. Pilot implementation of IT collaboration service</td>
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<td>8. Dissemination of project results</td>
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1. Effective project management and quality assurance of all major results throughout the project.
2. Analysis of technical standards, interoperability, laws and regulations, equipment and applications with respect to harmonisation and the preparation of guidelines.
4. Identification of relevant procedures, including problems and delays in these procedures.
5. Based on the results of the analyses referred to above, from a workshop for clinicians on their procedures and best practice from other telemedicine projects, the new procedures where the new technology supports and contributes to a more appropriate flow are described.
6. Development of software for collaboration service and the communication standards to be used.
7. Installation of collaboration IT service in the various organisations.
8. Dissemination of project knowledge and experience the healthcare sector and industry through printed matter, website and conferences.

Start of project in the spring of 2002, end in the spring of 2005.

**Politicians:**

**Effective utilisation of resources, satisfied patients, regional development**

The general public wants the best possible treatment of diseases and illnesses and at the same wants the lowest possible costs for the health service. It is the task of the politicians to accomplish this complex task, and in this context information technology is a useful tool.

In many ways, health service trends are leading to an increased concentration of knowledge and resources. This is a situation that may be difficult to handle in reality, where the patients also regard the proximity of treatment facilities as an important quality in itself.

Information technology makes it possible to utilise knowledge and resources regardless of distance. The result is higher quality, better utilisation of resources and more satisfied patients.

At the same time, the development work on IT solutions in itself helps support regional business development – all the participating regions attach great importance to business development in the area of IT.
Knowledge BLAZES trails

In many situations there may be a shortage of expert assistance when a patient needs treatment. The local place of treatment may, perhaps, lack experts in a particular area, or the experts at the place of treatment may need a second opinion. An example:

- After a road-traffic accident, a male motorist is hospitalised with a severe head injury. The patient is unconscious.
- The local hospital takes a CT/MRI scan, but wants a second opinion on the situation. The hospital looks for an available neurosurgeon through the IT Collaboration Service and is told that a neurosurgeon at Odense Universitetshospital will be available in 30 minutes.
- A request for assistance and a reservation for this assistance is sent to Odense University Hospital from the local hospital.
- CT/MRI scans and a referral describing the patient’s clinical situation are sent to Odense University Hospital.
- The neurosurgeon analyses the images and other information concerning the patient. The surgeon returns his neurological/radiological report.
- The optimum healthcare expertise has been available for treatment without the need to move the patient, it should be noted.

Patients CROSS borders

It is not always sufficient to exchange knowledge between experts for treatment to progress. Diagnosis, surgery and follow-up treatment may in many cases involve several hospitals, and it is vital that the communication process is smooth and effective for the sake of the patient.

- The general practitioner in Tinglev refers a female patient to Haderslev Hospital. He makes the diagnosis of lung cancer, and refers the patient for surgery at Odense University Hospital.
- Odense University Hospital initially responds to the referral by asking Haderslev Hospital to carry out several tests before surgery can be carried out.
- The tests are performed, and the results are forwarded.
- The patient is transferred to Odense and undergoes surgery. She is transferred back to Haderslev Hospital to carry out several tests before surgery can be carried out.
- The tests are performed, and the results are forwarded.
- The patient chooses radiotherapy in Flensburg. Haderslev Hospital sends relevant data to the hospital in Flensburg.

South Jutland County: County of Funen:

South Jutland County is the regional authority for 23 local authorities. The country runs three somatic hospitals and additionally has utilisation agreements with the Danish Rheumatism Association and the board of the self-owned institution Aabenraa Hospital. The total somatic capacity is 904 beds.

Odense University Hospital is one of the largest Danish hospitals, with a standard capacity of 1,193 beds and with almost 120,000 treatment episodes a year. Its work encompasses both basic tasks and a large number of national and regional tasks. The hospital has significant research and training activities.

The Danish Centre for Health Telematics is an office community of project organisations, all of which are working on the development of healthcare communication at regional, national and international levels. These include FynCom, the regional healthcare data network in County of Funen, MedCom, the national healthcare data network in Denmark, and International Office, which takes part in international healthcare IT activities and EU projects.
Within a period of around ten years, telemedicine will become an essential, decisive factor in medical practice. Telemedicine will be part of the day-to-day treatment, with healthcare professionals involved in virtual collaboration to strengthen the treatment of patients.

Technology is gaining ground in this area from one year to the next. It is now technically possible to carry out on-line videoconferencing and transfer texts, images, video clips and audio data between different healthcare professionals and between healthcare professionals and patients. The general public can access healthcare experts regardless of geographical location.

The regions and hospitals outside the traditional educational centres have better prospects of attracting and holding onto experts by establishing virtual specialist teams. Hospitals, specialists and others will be able to offer their services on virtual markets for healthcare services.

In the light of the standardised solutions and healthcare processes, the IT industry will be able to develop projects for growing markets.

The Klinik für Diagnostische Radiologie will, among other things, use the ciTTis project to strengthen the clinic’s research profile. With Germany’s second largest university hospital behind us, we can move our research collaboration forward into a new technological phase. This applies to all levels, regionally, nationally and internationally.

The particular type of research we carry out is well suited to the electronic exchange of information. Aspects such as the synergy effect generated by international collaboration mean that we can step up our research initiatives without having to make significant investments. Researchers in Kiel will be in the forefront, and positions in Northern Germany will become more attractive.

In the longer term, our treatment and training programmes will be improved. New research results can be disseminated much more rapidly, and by using flexible distance-teaching facilities, we will be able to offer in-service training to many more doctors.

Professor and Director
M. Heller, M.D., Klinik für Diagnostische Radiologie am Universitätsklinikum Schleswig-Holstein in Kiel
We have the TECHNOLOGY at our disposal

Telemedicine enables healthcare professionals to collaborate quickly and directly with other specialists on patient treatment. It is a network-based IT service, developed and tested successfully over a large number of projects. Telemedicine solutions normally focus on a very specific area of work, where the parties concerned agree on working methods and a technical solution. There are many benefits to it, but the potential of telemedicine is not least in establishing a system that makes it possible to join all kinds of telemedicine applications together, regardless of technological platform and commercial interests. This is precisely where the cITTiS project comes in.

The EU project PICNIC has identified a number of software components – Collaboration IT – that can link together different software applications and services in a regional healthcare network. Some of these components will be used in cITTiS and will constitute a set of technical tools, which are to be usable by all IT suppliers in Open Source. Standards already developed will be used to exchange information – for example SCP-ECG, DICOM, EDIFACT, XML CDA.

Collaboration IT-service will contain information on:

- Connected users/applications
- Available healthcare specialists
- Price list of different types of resources
- Profiles of organisations and healthcare specialists
- Definition of the exchangeable types of information
- Billing

These screens show how two or more healthcare professionals use the program to discuss an X-ray. One of the benefits of using Collaboration IT-service – instead of sending the images and then discussing the images over the telephone – is that the discussion is saved and can serve as documentation later on.
Major CHALLENGES for communication and organisation

The technology is far from doing it alone. In relation to a project like ciTTis it is not unrealistic to estimate the effort made with respect to development of the technology at around 30 per cent, while the requirements for organisational development constitute the remaining 70 per cent.

The telemedicine solutions will additionally include a number of protocols specifying the data and technical standards which are to be exchanged in different sequences of events. The events are typically information in the form of a referral, image, video clip, clinical e-mail, X-ray report, etc.

An important product of the project is therefore harmonisation of clinical and administrative practice in diagnostics and patient treatment and therefore a stronger cultural community.

Participating in the ciTTis project will allow DIAKO to utilise the experience we have gained from regional and international collaboration. We have already been taking part for many years in a telemedical network with the St. Franziskus-Hospital in Flensburg and the Association of General Practitioners in Flensburg. In addition, we have had five years of successful collaboration in teleradiology with three other hospitals. Transnationally, we treat patients from Denmark and Norway. With ciTTis, we anticipate expanding the good specialist networks to include multinational specialist networks and consequently improve the joint treatment of patients in all four regions. The close personal contacts that consequently emerge between specialists from both countries promote this development. Of further interest is the development of a new chip-based patient card, which is due to replace the present-day health insurance card in 2006. The Federal state of Schleswig-Holstein has been given the task of testing this patient card in the model region of Flensburg and is conducting a pilot project, which is expected to be of significance to the whole Federal Republic.

ciTTis and the patient card project are part of a mutual relationship of development, which in its trans-boundary dimension encompasses the whole of Europe.

Regional development

Regional development – an important added bonus.
The project includes the development of hardware and software solutions, which will be of interest to all suppliers of telemedical equipment. The project will emphasise the involvement of potential suppliers in all the regions, so they receive information on the content, aims and results of the project and on relevant technology services to which the project gives rise. The project will probably inspire interregional and international technology cooperation and contracts. External suppliers and interested parties who monitor the project will acquire valuable knowledge of procedures and standards.

At the same time, the telemedical solutions developed during the project will help retain and attract healthcare staff who would otherwise not have a professional, interdisciplinary network in support of local treatment facilities.

Great potential in collaboration

In South Jutland County we are well aware of the great potential that exists in expanding our national and international collaboration.

In many areas, the last ten years have brought significant development in the working relationships within what is commonly referred to as the southern region – Funen, Southern and South Jutland. This applies, for example, to the hospital area. We are accustomed to thinking in terms of cooperation where our German neighbours are concerned. It is only natural for us to expand the cooperation further, and the new technology is a fantastic new tool in this area.

In the ciTTis project we see an obvious opportunity for the hospitals in the Danish and German regions to supplement and strengthen another. This will benefit the patients, who receive the best possible treatment in the most straightforward way. At the same time, it benefits the healthcare sector, because the experience sharing is synonymous with a valuable growth in quality.

Claus Toftgaard,
Hospital Director,
Haderslev Hospital

Experienced and focused on development

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Medical Director
Ulrich Schroeder, M.D.,
DIAKO, Diakonissen-Krankenhaus Flensburg
Secure electronic health information

The EU supports health projects that could potentially pave the way for a joint e-health strategy. Wide-ranging experience has already been accumulated through the ciTTis project, providing a basis for developments that will first and foremost mean better healthcare services for EU citizens, but which will also offer major gains in terms of health and medical research.

The secure exchange of vital health information now plays an ever-increasing role in individual EU countries and is also a high priority in the EU’s common health policy initiatives. This is one of the areas where the ciTTis project will bring its experience of electronic communication to bear as a useful tool for exchanging health-related information across borders. The project will benefit health sector workers and patients alike. The EU Commission is following the ciTTis project with interest and has high expectations in respect of the further benefits to be gained from the project.

Jean Claude Healy,
Head of Unit,
The European Commission

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