Insight and experience gained from clinical telemedicine applications

Alexander Horsch, Gunnar Ellingsen, Gunnar Hartvigsen, Per Hasvold
Healthware Workshop, Luxembourg, 6 April 2006
Tromsø, Norway
Norwegian Center for Telemedicine

- Radiology
- Pathology
- ENT
- Dermatology
- Cardiology
- Psychiatry
- eLearning

20 Years Telemedicine Service Experiences
Teleradiology

Routine service since many years.
Experience

Struggle with vendors to comply with interoperability standards.

Challenge of making hospitals purchase such equipment (governance!).

Gap between claim and real demand for collaboration. Sharing of responsibility has hardly happened, so far.
Screening for diabetes patients

Patient and assistant
Experience

A telemedicine application can have an impact on general medical practice.

Ophthalmologists at UNN stayed with grayscale!
Cardiosound
Cardiosound

- **Scenario**
  - Heart-sound transmission for children (BUT: volume is the elderly population!)
  - 100 patients per year referred to UNN, most are healthy

- **Experience**
  - Clear benefit for specialist, 2 min instead of 15-20 min
  - Difficult from GP point of view: seldom used, equipment use difficult, reimbursement, additional cost for electronic stethoscope
  - used less than expected

- **Conclusion**
  - Electronic stethoscope must become the regular instrument
Experience

Equipment and instruments needed for telemedicine should be used in routine for local practice as well, especially if telemedicine is seldom applied.
Telepathology
The success of a telemedicine application may completely depend on the user scenario with its specific preconditions and expectations.
Emergency service with Spitzbergen

- **Scenario**
  - Emergency teleconferencing between Spitzbergen (small outpatient hospital) and UNN, currently under evaluation

- **Experience**
  - Extremely useful to avoid unnecessary transportation by plane or give support for stabilizing the patient
  - Other healthcare organizations on the mainland asked for the same service

- **Conclusion**
  - Success in one place with a clear benefit gives rise to more demand
Experience

Due to a telemedicine service, organizational changes have been made at the emergency center: multi-disciplinary medical team is gathered for the emergency teleconference – and now also for general emergency cases!

Here, technology led to the opportunity to perform a change.
ENT – Otorhinolaryngology

GPs in Alta to UNN (400 km)
Experience

Growing number of cases in a first phase (several years), but then gradually drop of the number of cases due to knowledge transfer from specialist to GPs.
Teledermatology

Advice on diagnosis of moles, follow-up of light treatment, etc.
Experience

Initial skepticism (palpation and smell mandatory!) made recruitment of specialists difficult.

But simple pilots proved beneficial services possible in the framework of the limited technology.
Success / failure / outdated

Simple service
Good organizational implementation
WELCOME

Good service
Drying-out need
OUTDATED

Good service
Unbalanced benefits
NOT ACCEPTED
Telemedicine driving forces

Equal access to healthcare services
- Stand-alone applications
- Specialized to specific domains

Digitized healthcare organizations
- TM as integrated functions of standard IT
- General purpose plus specialized functionality
Munich University of Technology

12 faculties with 240 chairs
400 professors, 9,000 scientists and other employees
3 campuses: downtown, Garching, Weihenstephan
19,000 students in 70 studies
Klinikum rechts der Isar

Foundation 1 May 1834 as “Armen- und Krankenanstalt Haidhausen”

10 Years
Telemedicine Projects

- Plan beds: 1,133
- Installed beds: 1,114
- Utilization of installed beds: 81.20%
- Full in-patient days: 330,181
- Partly in-patient calculation days: 19,603
- In-patients: 39,529
- Average duration of stay: 8.35 days
- Ambulant patients: 163,286
- Ambulant treatments: 248,086

The University Hospital in 2003
Remote Collaboration and Image Processing in Endoscopy (tumors)
ENDOTEL

Asynchronous Teleconsultation (EST)
Endoscopy Information System (EIS)
(1999-2004)
ENDOTEL Teleconsultation

- **Scenario**
  - Asynchronous, multimedia inquiries to specialist at hospital
  - Field test has been performed, but currently not in use

- **Experience**
  - Less interruptions of the specialist by pager calls
  - Closer connection of practitioners to center of excellence
  - Audio + video was the preferred media combination
  - Problems with reliance and lack of integration in standard IT

- **Conclusion**
  - *Integration in daily-used IT is almost mandatory*
ENDOTEL Teleconsultation

Willkommen, Frau Dr. Brandes

Aktueller Stand am 11.7.2003
Nachrichten im Posteingang: 0
Nachrichten im Postausgang: 0
Anzahl der Patientenfälle: 1

Neuer Fall

Fallübersicht

Posteingang

Postausgang
Experience

The application’s user interface must be very simple and intuitive!

The bigger the buttons the better they are.
ODITEB

Open DIstributed TExtbok for tumor diagnostics, an interactive Internet eLearning application (1997-1998)
Experience

Interaction and case-based, problem-oriented approach are important in eLearning!
Experience

Authoring of medical content is not just another job for free evenings or weekends!
It must be supported by tools and it must be recognized.
eLearning in Ophthalmology

Virtual Policlinic Ophthalmology of the Virtual University Bavaria (2000-2001)
Experience

An eLearning application that gives credits to the students (and is not too boring) will have good chances to be accepted.
TECSAC

TEleCollaboration for Signal Analysis in Cardiology and Distributed Cardiologic Record (1994-1996)

Cooperative treatment of cardiac patients by Munich University of Technology and Munich Heart Center. Distributed patient record was used since then.
The technology of a telemedicine application may be very simple, but a real need for communication / collaboration can make it a full success.
Other projects at TUM

- Surgical telepresence
- Craniofacial surgery planning
- Emergency ECG transfer from ambulance
- Teleanaesthesia
- Telepathology
- Teleophthalmology
- Telecardiology

...and many more
Experience

Many project scenarios are artificial (pioneer spirit, funding) in terms of real world and the need for sustainability.

Deployment is still difficult due to missing (inter-)national infrastructure & interoperability.
Actual state at TUM university hospital

- More than 10 years experiences
- Numerous projects and demonstrations
- Only few applications in routine
- Acceptance very diverse
- Barriers: Time, money, benefit!

- Strategic focus on eHealth services for referring physicians and hospitals and patients.
- On background of implementation of the German telematics infrastructure
CONCLUSION
ICT Solutions in Healthcare delivery

Technology driven
Disappointment
HELP!!

Globalisation
Patient Power
The Medical profession
The World Wide Web
New Technologies

Healthcare Professionals: Sit on the fence or Resist
“I told you so!”
Accept the inevitable and want control

(Richardson, modified)
Approaching the invisible

Exploring Feasibility:
Look, it works!

Exploring Sustainability:
Get it, it’s worthwhile!

(Mancini, 2004)
Thanks for listening!

A recipe for good health

- Be rich
- Pick your parents well
- Get educated
- Live in supportive, safe communities
- Live in quality housing
- Avoid stressful low-paid manual work
- Don’t lose your job

Roy Romanow, Commissioner
Commission on the Future of Health Care

Training on health in the EU, Cyprus, 20-21 September 2003