Lessons Learned from 20 years with Telemedicine in North Norway

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Abstract. The tutorial offers a historical review of the pioneering activity in telemedicine in North Norway over the last 20 years and includes a presentation of the following telemedicine services: teleradiology, teleotorhinolaryngology (ENT), telepathology, teleophthalmology, teledermatology, telecardiology, telenephrology (teledialysis), teleobstetrics/prenatal telemedicine services, teleemergency service, teleoncology, telecare, teleodontology, teleendocrinology (telediabetes), telesurgery, telepsychiatry, telemedicine solutions for patient empowerment, maritime telemedicine, E-learning in medicine, videoconference in telemedicine services, messages and electronic communication in telemedicine services, and reimbursement. For each service, problem, solution, and lessons learned will be presented.

Keywords. Telemedicine, remote consultation, videoconference in telemedicine, messages and electronic communication in telemedicine, reimbursement.

Rationale

This 3 hours tutorial will provide an overview for anyone who wants to better understand how telemedicine services can improve specialist health care, particularly in rural areas. The tutorial is based on more than twenty years of experience with telemedicine services in North Norway.

Since late 1980ies, telemedicine in North Norway has been an important part of the healthcare service in on of Europe’s most remote areas. Through telemedicine, specialist health care services have been offered to people in remote areas on a permanent basis. The first telemedicine projects in North Norway were initiated in 1987-1988 at Televerket's research institute (the Norwegian state-owned telephone company’s research department) together with Norut IT (research centre at University of Tromsø), Tromsø Regional Hospital (later University Hospital of North Norway - UNN), Kirkenes Hospital (within telepathology) and Troms Military Hospital (within teleradiology). In 1993, Department of Telemedicine at UNN was established. The department rapidly became one of the most visible telemedicine centers worldwide. The centre’s strength was its ability to establish real telemedicine services that served the

1 Corresponding Author. Gunnar Hartvigsen, PhD, Professor; Medical Informatics & Telemedicine group, Department of Computer Science, University of Tromsø & Norwegian Centre for Integrated Care and Telemedicine, Realfagbygget, Hansine Hansens veg 54, 9037 Tromsø, Norway; Email: gunnar.hartvigsen@uit.no; Phone: +47 90657785
population in North Norway. In 1999, it became the Norwegian Centre for Telemedicine (NST), and was labeled as a Centre of Expertise in Telemedicine. In 2002, NST was appointed as the first World Health Organization (WHO) Collaborating Centre for Telemedicine. This status has later been renewed. As a WHO Collaborating Centre, NST shall: give strategic advice and support to WHO and member-states globally; create awareness and demonstrate e-health proven practice; facilitate research on telemedicine and e-health.; facilitate training and collaboration; and, support e-learning and human resources development.

In 2009, NST was named Norwegian Centre for Integrated Care and Telemedicine. Today, NST is with its more than 120 employees a driving force in telemedicine research and development, both nationally and internationally.

After visiting Tromsø in 2008, Microsoft’s worldwide health senior director Bill Crounce, MD, wrote on his Healthblog, 9th June 2008: “Soaring to New Heights in Telemedicine and eHealth”:

“The research, services and programs offered in by the Norwegian Center for telemedicine are no less remarkable. While many countries are only now exploring home health monitoring, e-health applications for the management of chronic disease, virtual clinical visits on the web, and cell phones and cellular networks as a platform for telehealth services, the telemedicine center in Tromso has been breaking new ground for more than a dozen years. I was especially impressed by a teledialysis program developed by the center that is moving dialysis from hospital and clinic into the home.”

This 3 hours tutorial includes a presentation of the following telemedicine and services: teleradiology, teleotohinolaryngology, telepathology, teleophthalmology, teledermatology, telecardiology, teledialysis, teleobstetrics/prenatal telemedicine service, teleemergency service, teleoncology, telecare, teleodontology, telegeriatric, teleendocrinology/telediabetes, telepsychiatry, telemedicine solutions for patient empowerment, maritime telemedicine, videoconference in telemedicine services, and messages and electronic communication in telemedicine services. In addition, the tutorial addresses: E-learning in medicine, reimbursement of telemedicine services, and international projects in telemedicine.

For each service, the tutorial will present problem, solution, and lessons learned [1][2][3]. Some of the services will be presented in detail. In addition, they will be illustrated by video-clips from real situations. At the end of the tutorial, we will try to summarize what we have learned about telemedicine services, and try to look into the future of telemedicine services. The tutorial is mainly based on a forthcoming book about telemedicine in North Norway over the last twenty years [1].

1. Target audience

The target audience for this tutorial is clinicians and other healthcare workers; informatics researchers; government healthcare representatives and policy makers; master students in health sciences, medical informatics and others who want to learn more about telemedicine in practice.

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2. Prerequisite knowledge

No knowledge of telemedicine is required. General knowledge about specialist health care as well as use of ICT in health care is an advantage. The tutorial is part of an advanced course in telemedicine at the University of Tromsø, Norway.

3. Educational goal

Upon completion of the tutorial, participants will be able to:

1. Understand the role of telemedicine in health care service in general, and in specialist health care (in rural areas) in particular.
2. Understand the role and impact of information technology in telemedicine.
3. Understand the impact of the technology on patient empowerment, clinical outcomes, safety and quality of life in rural areas with basic health services only.
4. Understand the design and implementation challenges associated with telemedicine systems.

4. Contribution of each teacher

The tutorial is presented by professor Gunnar Hartvigsen. Hartvigsen is since 1994 Professor at the University of Tromsø, Department of Computer Science, and head of the Medical Informatics and Telemedicine group. Dr. Hartvigsen is since 2000 Adjunct Professor at the Norwegian Centre of Integrated Care and Telemedicine, University Hospital of North Norway. In 2007, he became research manager and director of Tromsø Telemedicine Laboratory, one of Norway’s centres for research-based innovation.

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