

# **Lessons learned from 25 years with telemedicine in Northern Norway**

**Gunnar Hartvigsen and Steinar Pedersen**





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## Preface

Telemedicine in Northern Norway is widely known for early adoption of telemedicine services to serve the population living in rural and remote areas in the Arctic. Visionary politicians, health administrators, doctors and researchers who saw the possibilities to offer high quality healthcare to everybody regardless of where they live initiated the development of telemedicine services in Northern Norway. In this book we present the journey towards fulfilling the vision of the Norwegian Centre for Integrated Care and Telemedicine (NST) – to create the basis for care over distance:<sup>1</sup>

*“Through interdisciplinary research and advisory services, NST will provide, disseminate and implement new solutions and new knowledge within collaboration, telemedicine and e-health in order to improve, simplify, and increase the effectiveness of the health and care service at the national and international level.”*

When starting Telemedicine in Northern Norway, little did we know about the ICT development in the years to come. Phenomenon such as Google and Facebook were many years ahead. Network connections were based on analogue telephone lines, or at the best, ISDN lines. In addition, mobile phones weighed 10 kg and was reserved for the very few. The development of the services described in this book has to be viewed with this as a background.

This book includes a presentation of the following telemedicine services:

- Teleradiology
- Teleotorhinolaryngology
- Telepathology
- Teleophthalmology
- Teledermatology
- Telecardiology
- Teledialysis
- Teleobstetrics/prenatal telemedicine service
- Teleemergency service
- Teleoncology
- Telecare
- Teleodontology/teledentistry
- Telegeriatric
- Teleendocrinology/-telediabetes
- Telepsychiatry
- Telemedicine solutions for patient empowerment
- Prenatal telemedicine
- Maritime telemedicine
- Videoconference in telemedicine services
- Messages and electronic communication in telemedicine services

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<sup>1</sup> <http://telemet.no/vision-and-objectives.5106888-261249.html> (Last accessed: 3.1.2014.)

In addition, the book addresses:

- Tele-education/distant education
- Reimbursement of telemedicine services
- International projects in telemedicine

For each service, we present problem, solution, and lessons learned. At the end of the book, we have tried to summarize what we have learned about telemedicine services in Northern Norway. Furthermore, we try to look into the future of telemedicine services. The book is mainly based on published reports and unpublished project presentations from NST, mostly written in Norwegian. With this book we want to make the knowledge and lessons learned from implementation of telemedicine services in Northern Norway available to a broader audience. For several years, a draft version of this book has been used as a textbook in the International 2-years master's program in telemedicine and e-health at the University of Tromsø – The Arctic University of Norway.

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

Upon completion of the book, readers 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.

This book does very briefly present some of the research projects that have been done or are going on at NST. Those who want to learn more about NST's research projects are referred to NST's web page.

### ***Acknowledgements***

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The authors want to thank the Norwegian Centre for Integrated Care and Telemedicine, University Hospital of North Norway, Department of Computer Science, University of Tromsø – The Arctic University of Norway, and Tromsø Telemedicine Consult AS for the opportunity to work on this book.

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Gunnar Hartvigsen

Steinar Pedersen



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