

Is telemedicine evidence based?



Professor Kristian Kidholm

CIMT- Center for Innovative Medical Technology

Demand for more telemedicine in Denmark

- **National political demand:**

Financing of Danish hospitals based on the expectation that number of "virtual hospital contacts" increases

- **Regional political demand:**

Strategic goal to increase the proportion of outpatient visits by video to 30%

- **A demand in the population:**

55% would like the contact to the health care system to be digital to a higher degree

(National survey with 1400 Danes, by the Association of Danish Patients, May 2020)



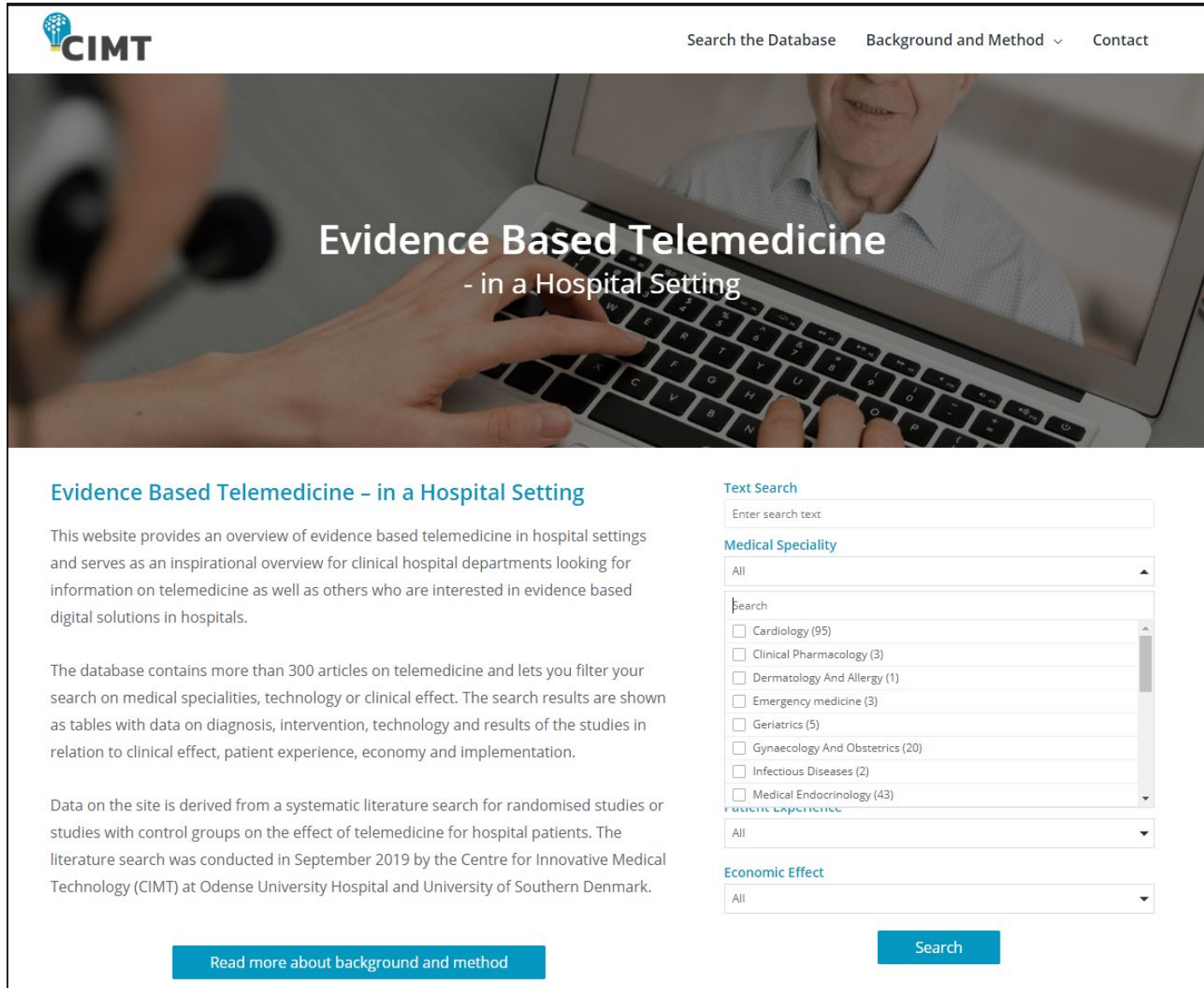


Is telemedicine
evidence based?

Which types of
telemedicine is
relevant for
my patients?



Where can I find
information about
the effects of
telemedicine



The screenshot shows the homepage of the CIMT database. At the top left is the CIMT logo, and at the top right are navigation links: "Search the Database", "Background and Method", and "Contact". The main header features a large image of a person using a laptop with the text "Evidence Based Telemedicine - in a Hospital Setting". Below this, the page is divided into two columns. The left column contains introductory text about the database's purpose and content. The right column contains a search interface with filters for "Text Search", "Medical Speciality", and "Economic Effect". A "Search" button is located at the bottom right of the search area. A blue button at the bottom left of the page says "Read more about background and method".

Evidence Based Telemedicine - in a Hospital Setting

This website provides an overview of evidence based telemedicine in hospital settings and serves as an inspirational overview for clinical hospital departments looking for information on telemedicine as well as others who are interested in evidence based digital solutions in hospitals.

The database contains more than 300 articles on telemedicine and lets you filter your search on medical specialities, technology or clinical effect. The search results are shown as tables with data on diagnosis, intervention, technology and results of the studies in relation to clinical effect, patient experience, economy and implementation.

Data on the site is derived from a systematic literature search for randomised studies or studies with control groups on the effect of telemedicine for hospital patients. The literature search was conducted in September 2019 by the Centre for Innovative Medical Technology (CIMT) at Odense University Hospital and University of Southern Denmark.

[Read more about background and method](#)

Text Search
Enter search text

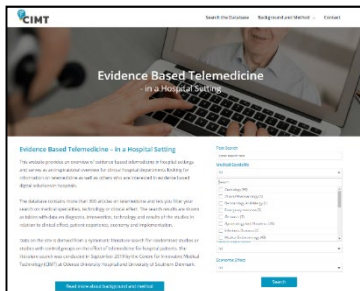
Medical Speciality
All

Search

- Cardiology (95)
- Clinical Pharmacology (3)
- Dermatology And Allergy (1)
- Emergency medicine (3)
- Geriatrics (5)
- Gynaecology And Obstetrics (20)
- Infectious Diseases (2)
- Medical Endocrinology (43)

Economic Effect
All

Search



Search the Database

Use the filters in the drop-down menus below to search the article database.

Text Search

Country

Clinical Effect

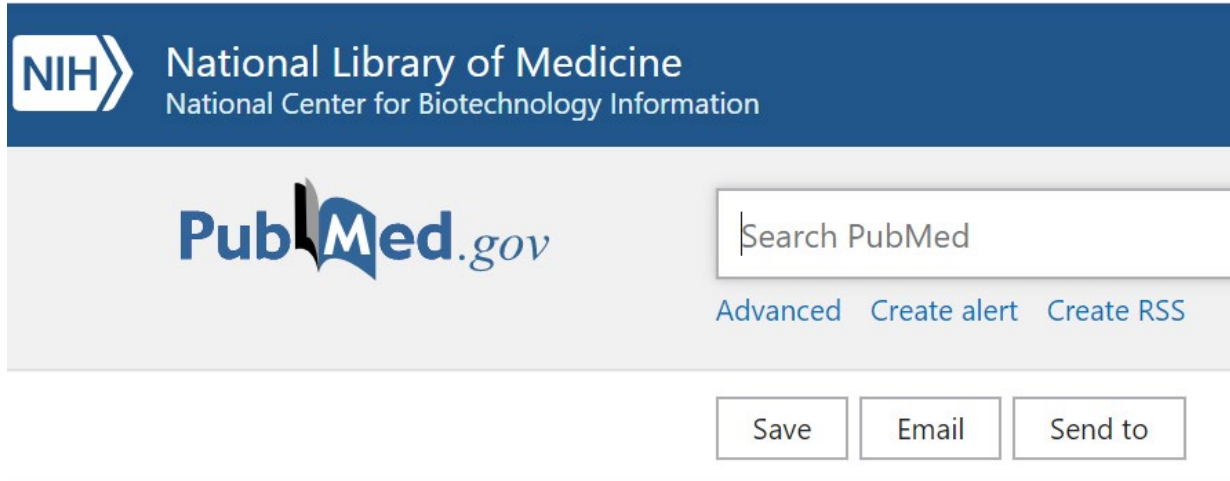
Economic Effect

Medical Speciality

Technology

Patient Experience

The basis of the database



NIH National Library of Medicine
National Center for Biotechnology Information

PubMed.gov

Search PubMed

[Advanced](#) [Create alert](#) [Create RSS](#)













Save Email Send to

- August 2019: 2.825 hits
- 331 artikler inkluderet til dataekstraktion


Litterature search in the Pubmed-database:


- Telemedicine = delivery of health care by use of *IKT over a distance between patients and hospital staff*
- Hospital setting
- Studietype: RCT and studies with a control group
- 2009-2019


Results of a search in the database


SOURCE	COUNTRY	DIAGNOSIS	INTERVENTION	TECHNOLOGY	CLINICAL EFFECT	PATIENT EXPERIENCE	ECONOMY	IMPLEMENTATION
1	Turkey	Diabetes mellitus, diagnosed in the previous year.	Patient education at the hospital in groups. Telephone follow-up on patient education, 1 call every week/first month, 1 call every second week/second and third month.					D
2	USA	Diabetes mellitus	Health buddy collect patient information on symptoms, vital signs, mental health, knowledge, and health behaviors by daily questions. Data were risk stratified for identification of appropriate feedback and intervention from care providers.					B+D
3	USA	Diabetes type 1, age 18-25 years	Complete 3 telemedicine video consultation appointments (with care provider only or a group session) and 1 in person visit.					B+D


Teknologi



App


Videokonsultation






Telefon


Hjemmemonitorering


SMS / mail


Hjemmeside

Klinisk effekt Patientoplevelse Økonomi

-  Ingen information
-  Positiv effekt
-  Ingen effekt
-  Negativ effekt

Implementering

- A** Kræver tværsektorielt samarbejde
- B** Kræver køb af nyt udstyr
- C** Kræver udvikling
- D** Kræver nye kompetencer eller nye opgaver
- E** Er tilføjet til den sædvanlige behandling
- F** Kræver EPJ-integration

Clinical outcomes of telemedicine?

- Positive stat. sig. effect: 48%
- No stat. sig. effect: 47 %
- Negative stat. sig. effect: 2 %
- No information: 3%

Implication:

- Negative effects are rare
- Should the primary outcome be clinical?

Tabel 6. Oversigt over klinisk effekt i artiklerne fordelt på de 22 specialer.

Speciale	Positiv statistisk signifikant effekt	Ingen effekt	Negativ statistisk signifikant effekt	Ingen info
Akutmedicin	3	0	0	0
Demato-venerologi	0	1	0	0
Gynækologi og obstetrik	8	11	0	1
Endokrinologi	24	18	1	1
Gastroenterologi og hepatologi	3	5	0	0
Geriatrici	4	1	0	0
Infektionsmedicin	1	1	0	0
Kardiologi	48	45	1	1
Lungesygdomme	22	28	2	1
Neurologi	2	1	0	1
Reumatologi	1	4	0	0
Karkirurgi	0	1	0	0
Kirurgi	3	3	0	0
Plastikkirurgi	1	3	1	0
Thoraxkirurgi	4	0	0	0
Urologi	1	0	0	0
Klinisk Farmakologi	2	1	0	0
Klinisk Onkologi	14	8	0	0
Neurologi	5	9	0	0
Ortopædisk kirurgi	7	8	0	1
Oto-rhino-laryngologi	2	0	0	0
Pædiatri	9	13	1	2
Total	164	161	6	8

Patient perception?

- Criteria: 50% satisfied or used the service
- Included in 48 % of studies
- 73% show positive patient perception

Implication:

- Patient perception is generally positive
- More studies should include:
 - Patient satisfaction
 - Acceptability
 - Empowerment...
- Look for differences between subgroups

Tabel 7. Oversigt over patientoplevelser i artiklerne fordelt på de 22 specialer.

Speciale	Info om patientoplevelser	Positive patientoplevelser
Akutmedicin	0	0
Demato-venerologi	1	0
Gynækologi og obstetrik	8	5
Endokrinologi	15	12
Gastroenterologi og hepatologi	4	4
Geriatrici	2	1
Infektionsmedicin	1	1
Kardiologi	42	30
Lungesygdomme	27	17
Nefrologi	3	3
Reumatologi	3	3
Karkirurgi	1	1
Kirurgi	5	4
Plastikkirurgi	2	1
Thoraxkirurgi	2	1
Urologi	0	0
Klinisk Farmakologi	0	0
Klinisk Onkologi	13	12
Neurologi	8	7
Ortopædisk kirurgi	6	2
Oto-rhino-laryngologi	1	1
Pædiatri	20	14
Total	164	119

Economics?

- Use of health care: 53 % of studies
- Of these: 52% find stat. sig. reduction in use

Implication :

- No the same as reduced total costs
- Often the costs of telemedicine is excluded
 - TeleKOL (2017): €700
 - Whole System Demonstrator: €1800
 - Teledialog (2016): €400

- The solution:



Tabel 8. Oversigt over økonomi i artiklerne fordelt på de 22 specialer.

Speciale	Info om økonomi	Positiv statistisk signifikant effekt
Akutmedicin	1	0
Demato-venereologi	1	0
Gynækologi og obstetrik	12	6
Endokrinologi	16	9
Gastroenterologi og hepatologi	4	3
Geriatri	5	3
Infektionsmedicin	1	0
Kardiologi	60	34
Lungesygdomme	36	15
Nefrologi	2	2
Reumatologi	1	0
Karkirurgi	1	0
Kirurgi	3	2
Plastikkirurgi	4	2
Thoraxkirurgi	4	2
Urologi	0	0
Klinisk Farmakologi	1	1
Klinisk Onkologi	7	3
Neurologi	6	2
Ortopædisk kirurgi	2	2
Oto-rhino-laryngologi	1	1
Pædiatri	11	6
Total	179	93

Implementation?

- Often 2-4 implementation challenges
- Most frequent:
 - B: Service require buying of new IT-devices
 - D: Service require new skills and education for staff

Implication:

- Implementation does not happen by itself
- Ressources for implementation should be included in the costs
- Examples:
 - Meetings with management
 - Staff meetings
 - Training for the staff
 - Development of new guidelines
 - Peer to peer training
 - Local project manager

Implementering

A Kræver tværsektorielt samarbejde

B Kræver køb af nyt udstyr

C Kræver udvikling

D Kræver nye kompetencer eller nye opgaver

E Er tilføjet til den sædvanlige behandling

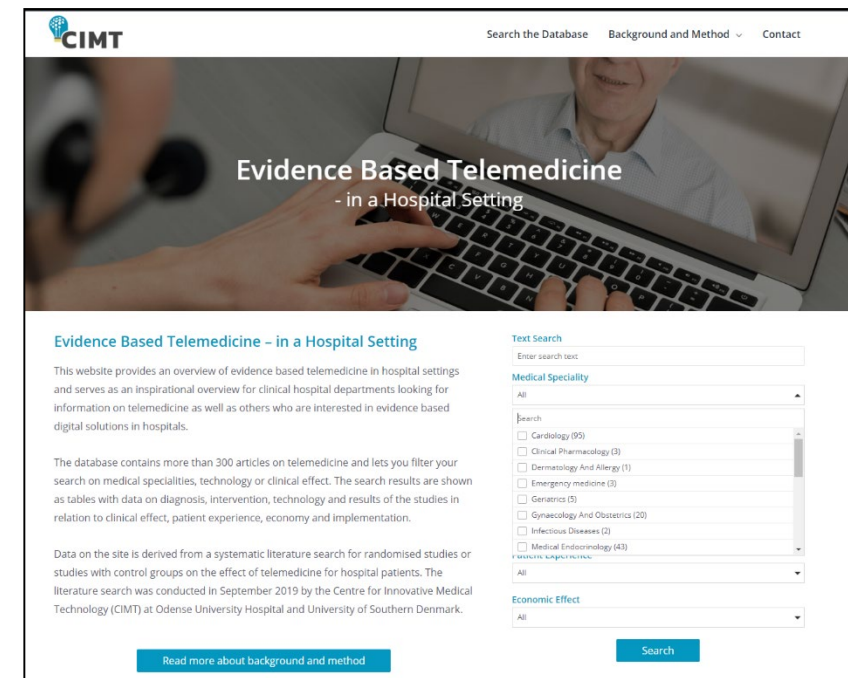
F Kræver EPJ-integration

Feed back from the Clinical departments?

- *"This is not for all patients"*
- *"We need training"*
- *"It has to work every time"*
- *"We need to involve the IT-Department"*
- *"Maybe we could start with this patient group"*



Conclusion



1. Many types of telemedicine is evidence based
2. Use the database to find evidence based telemedicine for your patients

Evidence Based Telemedicine - <https://telemedicine.cimt.dk/>