



Kunstig Intelligens i sundhedsvæsenet

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Hvem er GE Healthcare (GEHC)?

Segments

Business lines

Partners

Healthcare Systems (HCS)

Solutions for the diagnosis, treatment and monitoring of patients



Imaging

- MR
- CT
- X-Ray
- Interventional
- Surgery



Ultrasound

- General
- Cardiovascular
- Women's Health
- Point of Care



Life Care Solutions

- Monitoring
- Anesthesia
- Cardiology
- Maternal-Infant Care



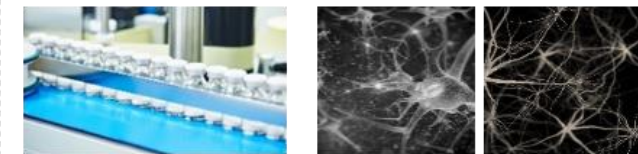
Enterprise Software and Solutions

- Enterprise Imaging
- Enterprise Performance Solutions
- Financing
- Edison™



Life Sciences (LS)

Solutions for the discovery and manufacturing of advanced medicines



BioPharma

- BioProcessing
- Protein sciences
- Cell & Gene Therapy



Pharmaceutical Diagnostics

- Contrast Agents
- Nuclear Tracers



GEHC

Healthcare Division

+/- 140 Bio DKK and 55.000 people

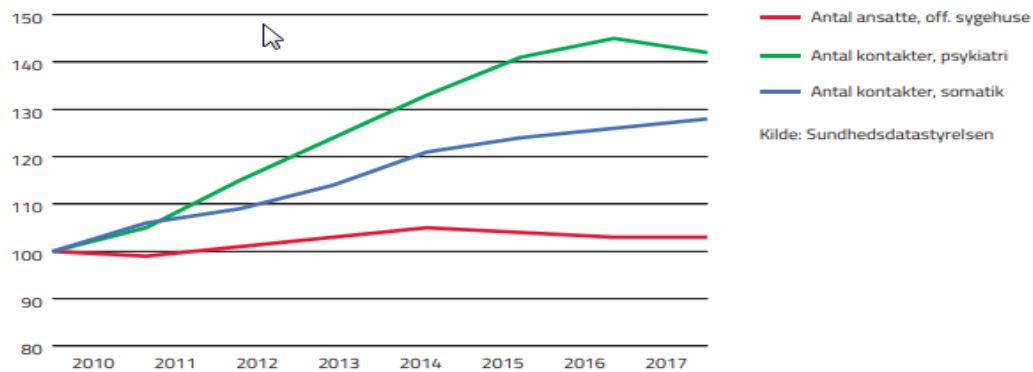




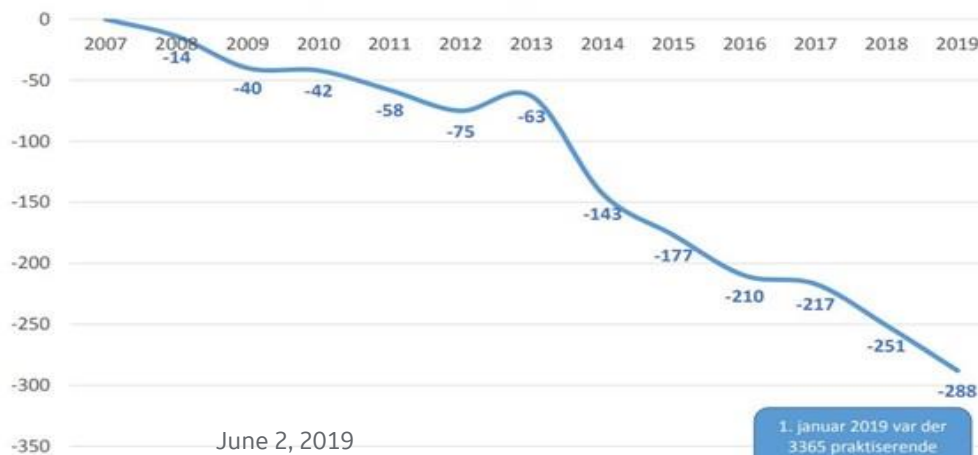
Kunstig Intelligens - en nødvendighed for sundhedsvæsenet?

Sundhedsvæsenet har det ikke så godt

Figur 3. Udvikling i antal ansatte og kontakter på offentlige sygehuse 2010-2017

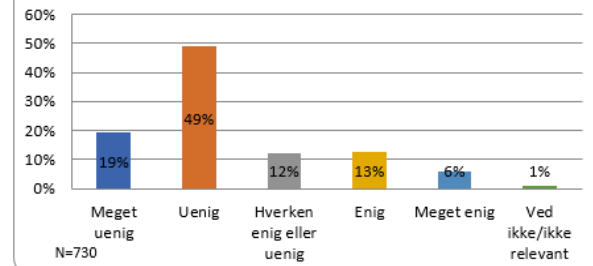


Antal færre praktiserende læger siden 2007

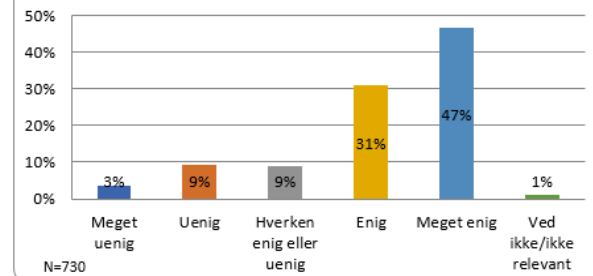


Kilde: Medlemstal over praktiserende læger med ydernummer pr. 1.1 i de enkelte år, Lægeforeningens Medlemsregister.

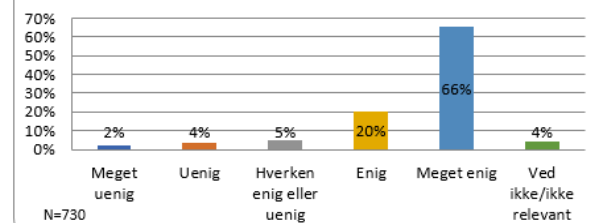
Jeg oplever, at der er ressourcer nok til at give patienterne den bedst mulige behandling



Jeg oplever arbejdsdage, som er så hektiske/travle, at det påvirker kvaliteten af behandling og pleje



Jeg har oplevet, at der er indenfor de seneste fem år er sparet personale væk eller tilført flere opgaver så du nu er mere travlt



AI er en del af svaret for Sundhedsvæsenet

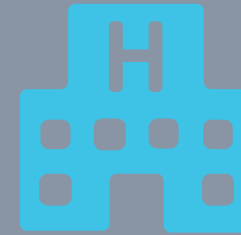
**Individuelt
niveau**



**Afdelings
niveau**



**System
niveau**



Smart Devices

LOGIQ™ E10
Doppler Assistant,
Auto Lesion Segment,
and OB Measure Assistant



*Critical Care Suite on
OPTIMA™ XR240amx



SonoCNS on Voluson E10



Powered by
Edison



††TrueFidelity images
from Revolution Apex



†MR AIRx™

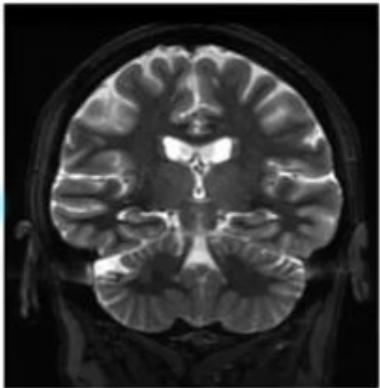
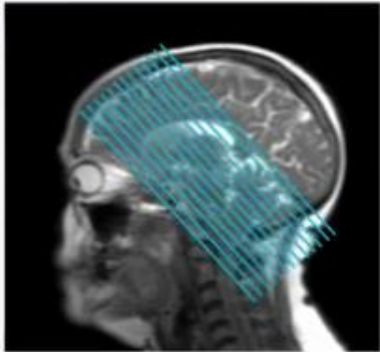
*510(k) pending at US FDA. Not available for sale in the United States.
†Available in US. Not CE marked. Not commercially available in all regions.
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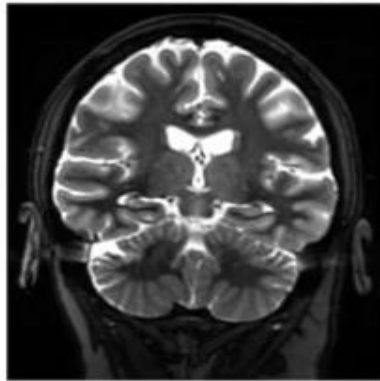
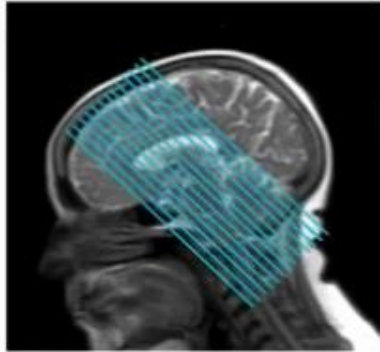
AI for MR scanings



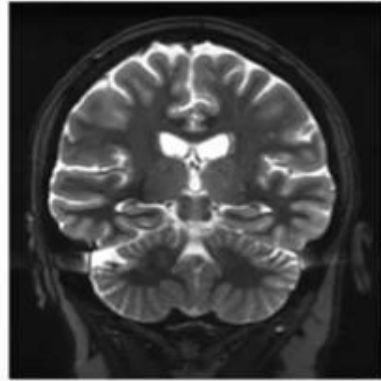
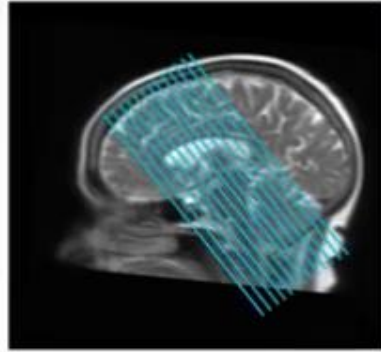
Month 1



Month 3



Month 7



Same scan everytime

time between sessions,



AI er en del af svaret for Sundhedsvæsenet

Individuelt
niveau



Afdelings
niveau



System
niveau

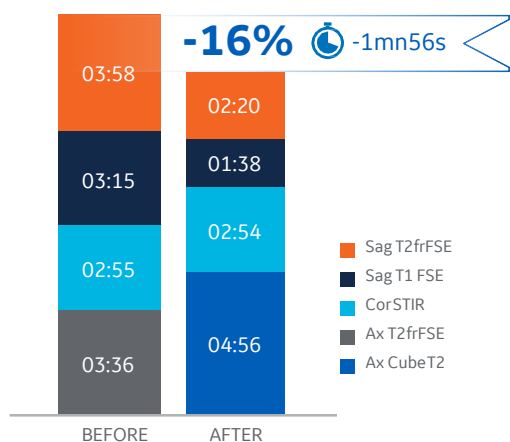


MR Excellence: Reducing patient waiting time for MR without sacrificing clinical quality

Dr. Christopher Ahlers
Managing Partner, Radiomed

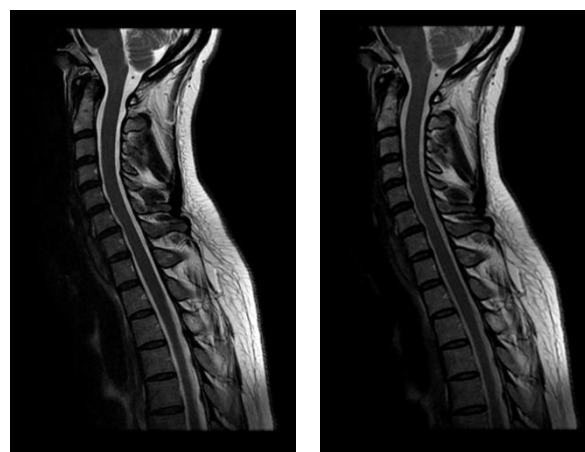


Optimize a protocol for efficiency



MR1.5T – Cervical Spine example

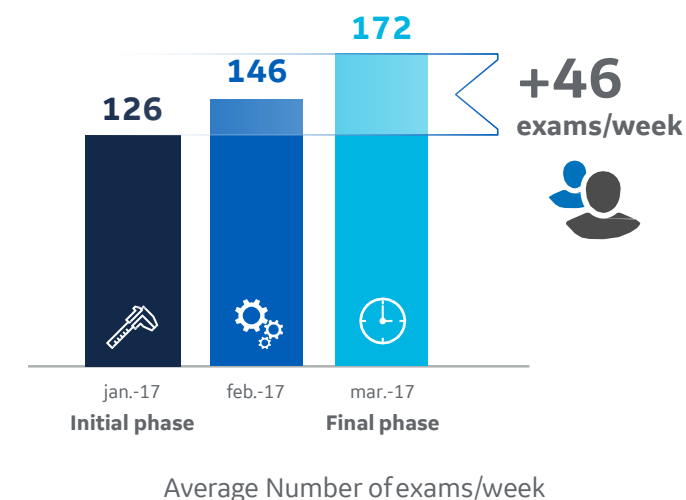
Cannot sacrifice the clinical outcome



Before

After

Proven and improved workflow



Large **production gains**.

Significant **reduction in patient waiting time** for exams.



* Using patient public reimbursement rate in Germany. Results listed here are of this specific customer and may not be typical. Results are based on factors specific to each customer. GE cannot guarantee these or similar results.

AI er en del af svaret for Sundhedsvæsenet

Individuelt
niveau



Afdelings
niveau



System
niveau



The Bradford Command Centre

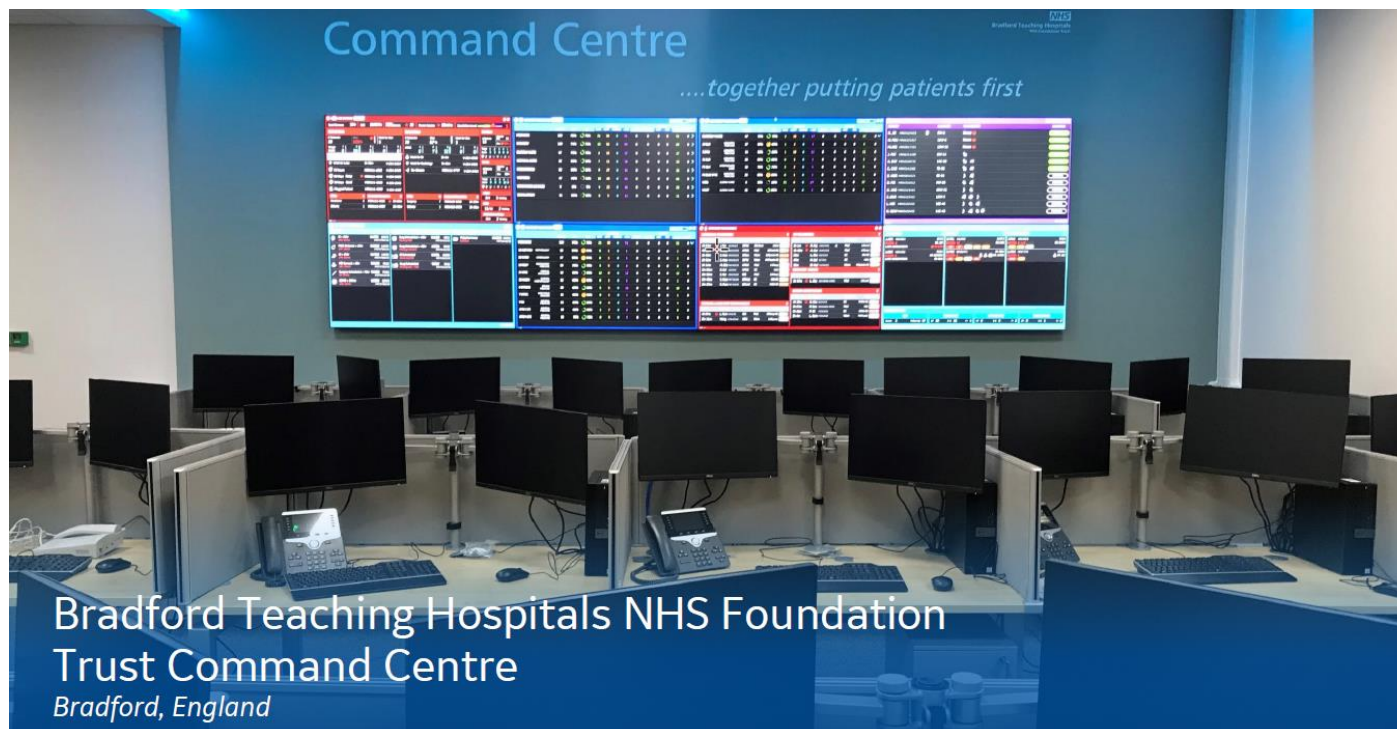
A New Era for Patient-Centred Care



Command Centre Physical Space Now Live!



Bradford Teaching Hospitals
NHS Foundation Trust



Together, putting patients first

Why a Command Centre?

Pressure in A&E
is mounting...

- 40% attendance growth over the past decade
- Admitting 33% of 135k annual attendances
- < 75% performance against 4-hour Standard

...creating challenges
downstream

- Bed occupancy +96%
- 10-15 medical outliers in surgical beds, and often many more in Winter

...and more of the same
is not an option

- Staff are stressed and managing by heroics
- Data becoming more available - now need to make it widely visible and actionable

Patient-centred care that works for our staff



For our patients

- **Less unnecessary waiting**, getting them the care they need *when* and *where* they need it
- **Less uncertainty**; a more consistent experience at BTHFT
- **The right placement** in the best care setting the first time
- **Reduced risk**, and faster mitigation of identified risk

For our staff

- **More time to do what you are here for**, and less on rework & waste
- **A single version of the truth** for what's happening in the hospital
- **Better support** for difficult decisions
- **More proactive**, less reactive
- **Fewer surprises** from predictable events

Patient-
for our s



Work as One

proves we can do better

For our pa

- Less unne
them the o
where the
- Less unce
experien
- The right p
setting the
- Reduced
identified

81% → 93%

*performance against ECS
(Emergency Care Summary)*

63% → 83%

ambulance handover within 15 mins

99% → 89%

bed occupancy

re here for,

for what's

ecisions

re

ctable events



AI - and Healthcare USA thoughts

Nyeste tanker omkring AI og billeddiagnostik



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Special Report

A Roadmap for Foundational Research on Artificial Intelligence in Medical Imaging: From the 2018 NIH/RSNA/ACR/The Academy Workshop

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Abstract

Imaging research laboratories are rapidly creating machine learning systems that achieve expert human performance using open-source methods and tools. These artificial intelligence systems are being developed to improve medical image reconstruction, noise reduction, quality assurance, triage, segmentation, computer-aided detection, computer-aided classification, and radiogenomics. In August 2018, a meeting was held in Bethesda, Maryland, at the National Institutes of Health to discuss the current state of the art and knowledge gaps and to develop a roadmap for future research initiatives. Key research priorities include: 1, new image reconstruction methods that efficiently produce images suitable for human interpretation from source data; 2, automated image labeling and annotation methods, including information extraction from the imaging report, electronic phenotyping, and prospective structured image reporting; 3, new machine learning methods for clinical imaging data, such as tailored, pretrained model architectures, and federated machine learning methods; 4, machine learning methods that can explain the advice they provide to human users (so-called explainable artificial intelligence); and 5, validated methods for image de-identification and data sharing to facilitate wide availability of clinical imaging data sets. This research roadmap is intended to identify and prioritize these needs for academic research laboratories, funding agencies, professional societies, and industry.

In August 2018, a meeting was held in Bethesda, Maryland, at the National Institutes of Health to discuss the current state of the art and knowledge gaps and to develop a roadmap for future research initiatives. Key research priorities include:

1. **New image reconstruction methods** that efficiently produce images suitable for human interpretation from source data.
2. **Automated image labeling and annotation methods**, including information extraction from the imaging report, electronic phenotyping, and prospective structured image reporting.
3. **New machine learning methods for clinical imaging data**, such as tailored, pretrained model architectures and distributed machine learning methods.
4. **Machine learning methods that can explain the advice they provide** to human users(so-called explainable artificial intelligence).
5. Validated methods for **image de-identification** and data sharing to facilitate wide availability of clinical imaging data sets.





Proposed Regulatory Framework for Modifications to Artificial Intelligence/Machine Learning (AI/ML)-Based Software as a Medical Device (SaMD)

Discussion Paper and Request for Feedback





... og så savner vi en stærk juridisk platform til at gøre Danmark “AI-ready”.

Andre kan gøre det lige så godt, eller bedre ?



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Promotion of welfare

Social and health services

Legislation

Children, young people and families

Old people

Secondary use of health and social data

Frequently asked questions about the Act on Secondary Use of Health and Social Data

Responsible agencies

Social services

Health services

Rehabilitation

Pharmaceutical service

Client and patient rights

Client fees

Social and health care personnel

Children, youth and families

Older people services

Social security and services of asylum seekers in Finland

Information management

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Secondary use of health and social data

A separate law has been laid down on the secondary use of health and social data (Act on the Secondary Use of Health and Social Data).

The purpose of the Act is to facilitate the effective and safe processing and access to the personal social and health data for steering, supervision, research, statistics and development in the health and social sector. A second objective is to guarantee an individual's legitimate expectations as well as their rights and freedoms when processing personal data.

The Act will facilitate

- the elimination of overlapping administrative burden related to the processing of permits
- the smoother and faster processing of permits
- the smoother collation of data from different registers
- the easier and more efficient use of valuable social and health materials in research and development activities
- clearer knowledge management by service providers and parameters for this
- the National Institute for Health and Welfare's data access rights and the legislative basis for the national registers that the institute is responsible for will be adjusted so it is in accordance with the requirements in the General Data Protection Regulation

The secondary use of health and social data means that the customer and register data created during health and social service sector activities will be used for purposes other than the primary reason for which they were originally saved.

The secondary uses referred to in the Act include:

- scientific research
- statistics
- development and innovation activities





Human



*Intelligence is the ability
to adapt to change.*

Stephen Hawking

*And AI is a smart
helping hand*



