



BLIKSUND

The future of prehospital care - Experiences from Norway

Dr Lars Knudsen & Fredrikke Vikhamar | Columna Healthcare Days | 7th of June 23

CONFIDENTIAL

Speakers



- Consultant Anaesthetist & PhD Aarhus University Hospital
- 20+ years of pre-hospital experience
- HEMS Physician at the Danish Air Ambulance Service
- AMK-doctor, Central Region.
- Prev. Head of Southern Norway Air Ambulance Service

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- Postgraduate, pediatrics (nursing), University of Stavanger
- Prev. commercial roles at ZOLL Medical Corp. & Laerdal Medical
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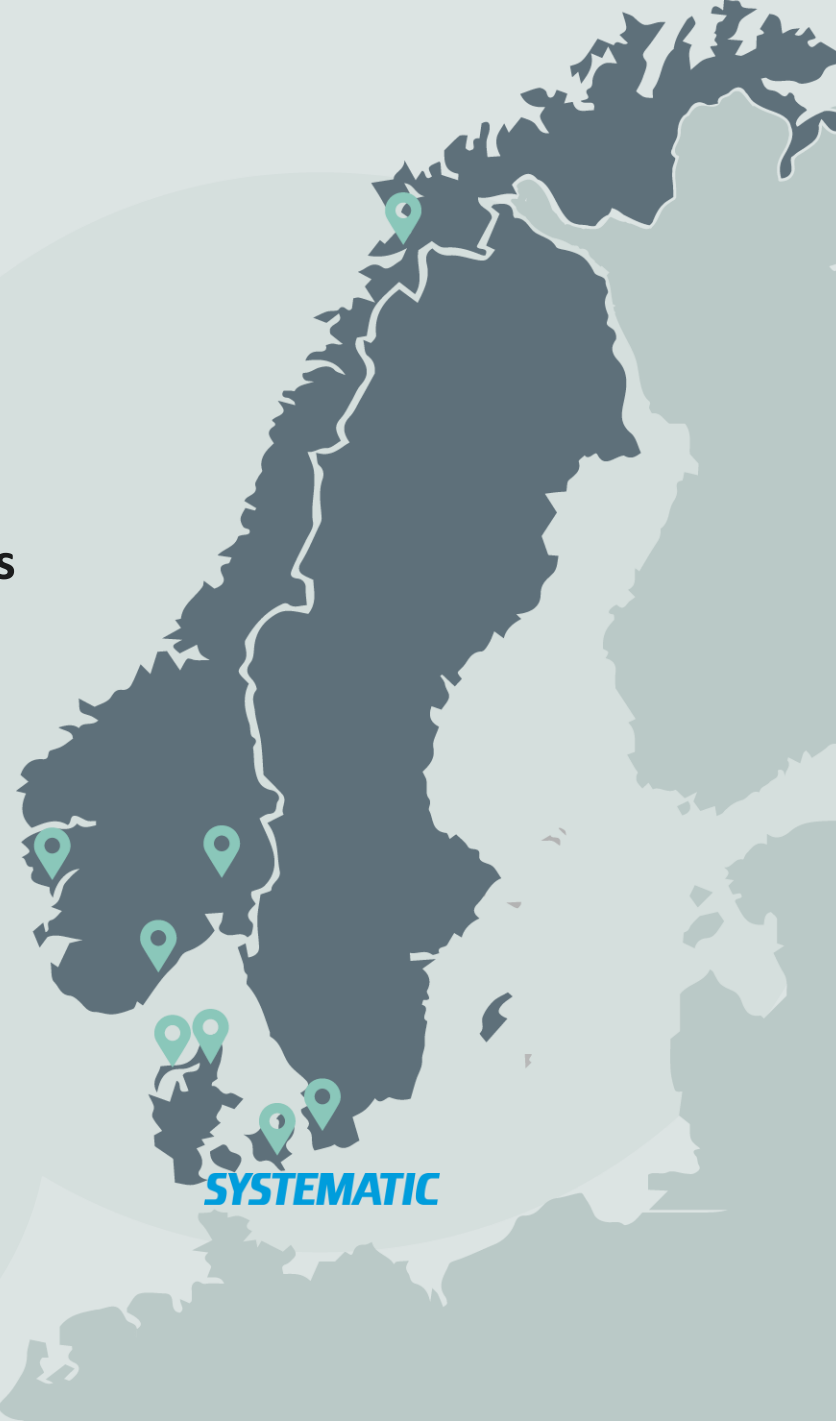
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Agenda

- 1.** Introduction to Bliksund
- 2.** Bliksund EWA in Norway (PPJ)
- 3.** The future of prehospital care – technological trends
- 4.** Conclusion

1. Introduction to Bliksund

Current office locations
...& we are expanding



10+ years

of innovation in the emergency services

15+

countries using our solutions

55+

employees, many with field experience
from the emergency & healthcare services

35.000+

active users on our software solutions



FIRE & RESCUE

**140 European fire and
rescue services**

**All Norwegian
dispatch centres for
fire & rescue**



HEALTHCARE

**All Norwegian Healthcare
Authorities and Hospital Trusts**

**Danish emergency medical
dispatch centres (Nord & Syd)**

**All Norwegian emergency
medical dispatch centres**

**Alle Norwegian ambulance
services**



POLICE

**Police of Denmark –
Centre for Emergency
Communications**

All Danish police districts

All Icelandic police districts

U.S. Department of State



DEFENCE & PUBLIC SAFETY

**Norwegian Armed Forces -
Defence Medical Services**

**Copenhagen
Emergency Services**

**30+ Red Cross and other
volunteer organisations**

2. Bliksund EWA in Norway (PPJ)





BLIKSUND EWA

Emergency worker assistant (EWA) is an electronic Patient Care Report (ePCR) solution for ambulance services and a real-time notice board for the emergency room providing updated patient status. Developed in close cooperation with health workers – providing you with a day-to-day assistant in the field.



BLIKSUND



5.400.000

INHABITANTS



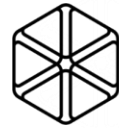
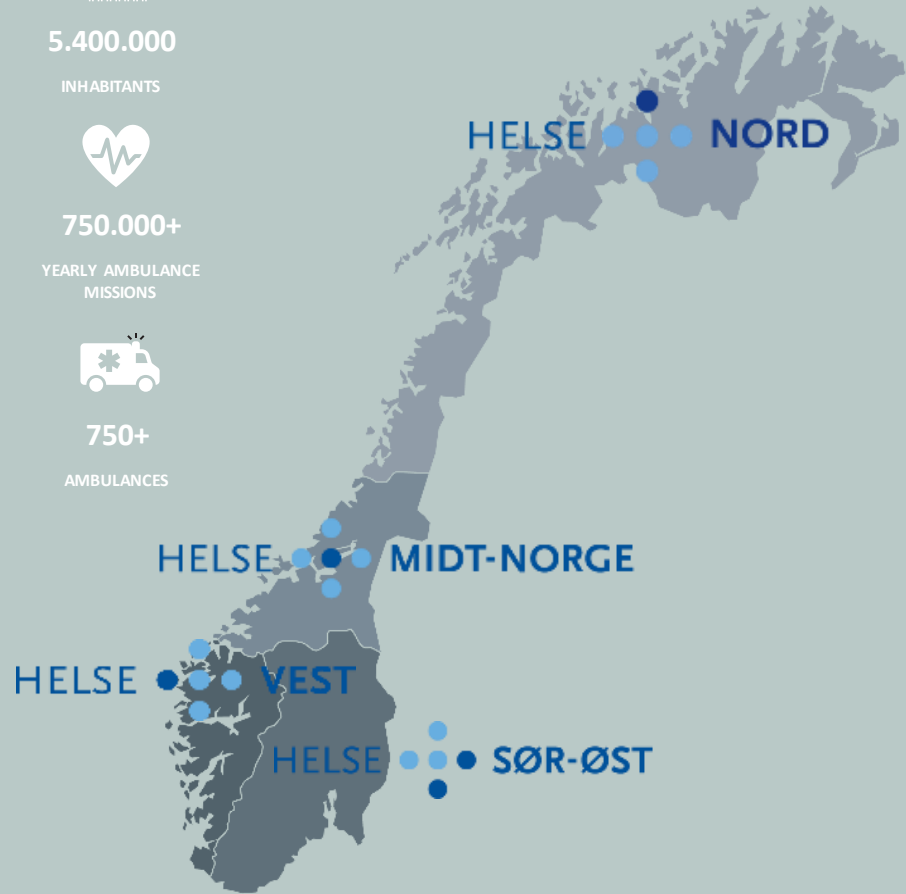
750.000+

YEARLY AMBULANCE MISSIONS



750+

AMBULANCES



BLIKSUND EWA

Bliksund EWA was selected in the national tender as ePCR for all of the Norwegian healthcare regions in 2019.

The solution was chosen thanks to the highest score on user-friendliness, state-of-art technology and ease of integrations with other IT systems in the emergency care chain.



Realtime is gold - now the emergency room can prepare while the patient is on its way.

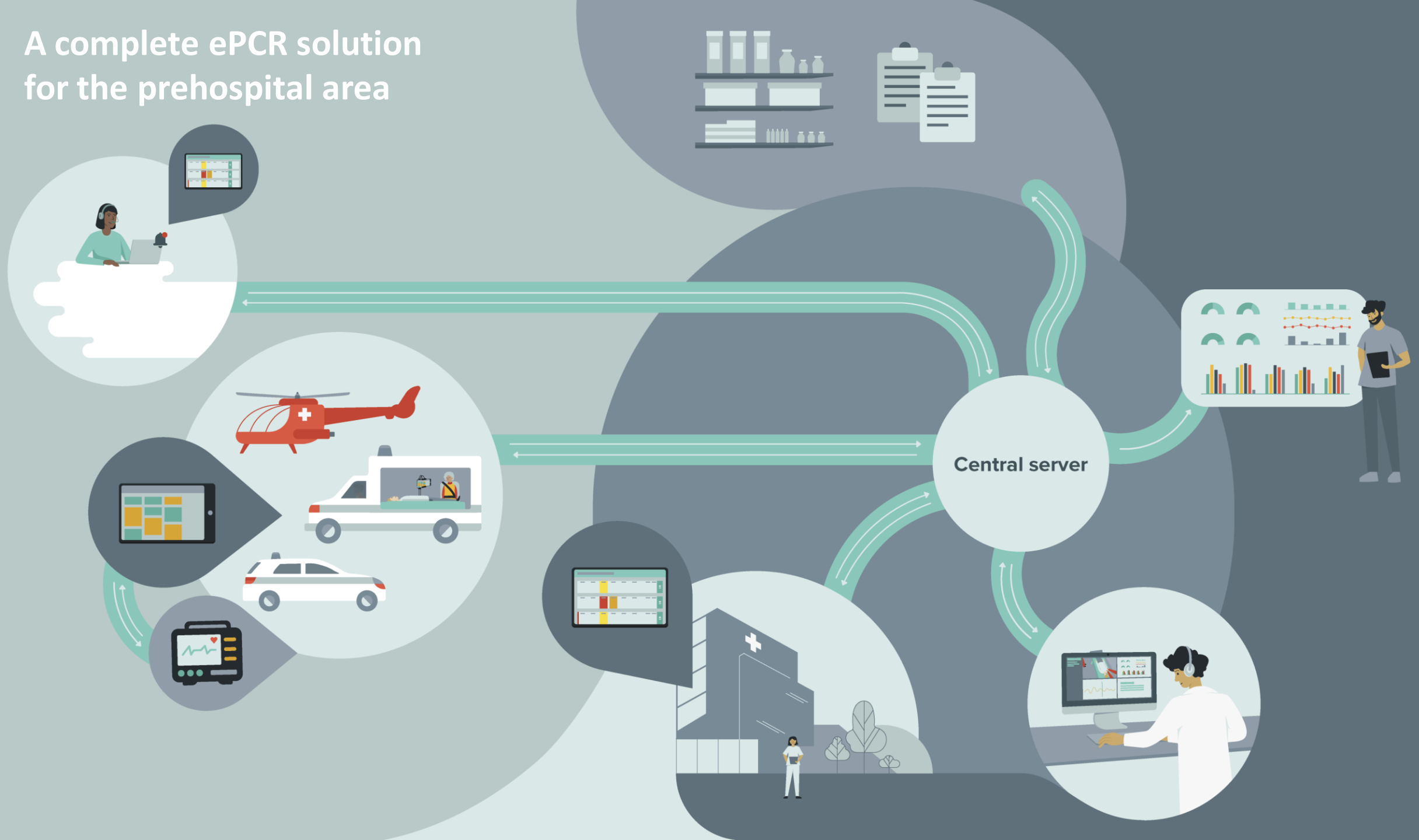
This provides a basis for better preparation, decision support and patient safety.

Morten Dragsnes
Head of Department
Shared Functions, Mid-Norway Ambulance Services



BLIKSUND

A complete ePCR solution for the prehospital area



Bliksund EWA is continuously improved through an agile delivery model, ensuring continuous delivery of valuable software improvements



Continuous development
Speedy iterations with quick feedback loops



Continuous deployment
New features are quickly released to end-users

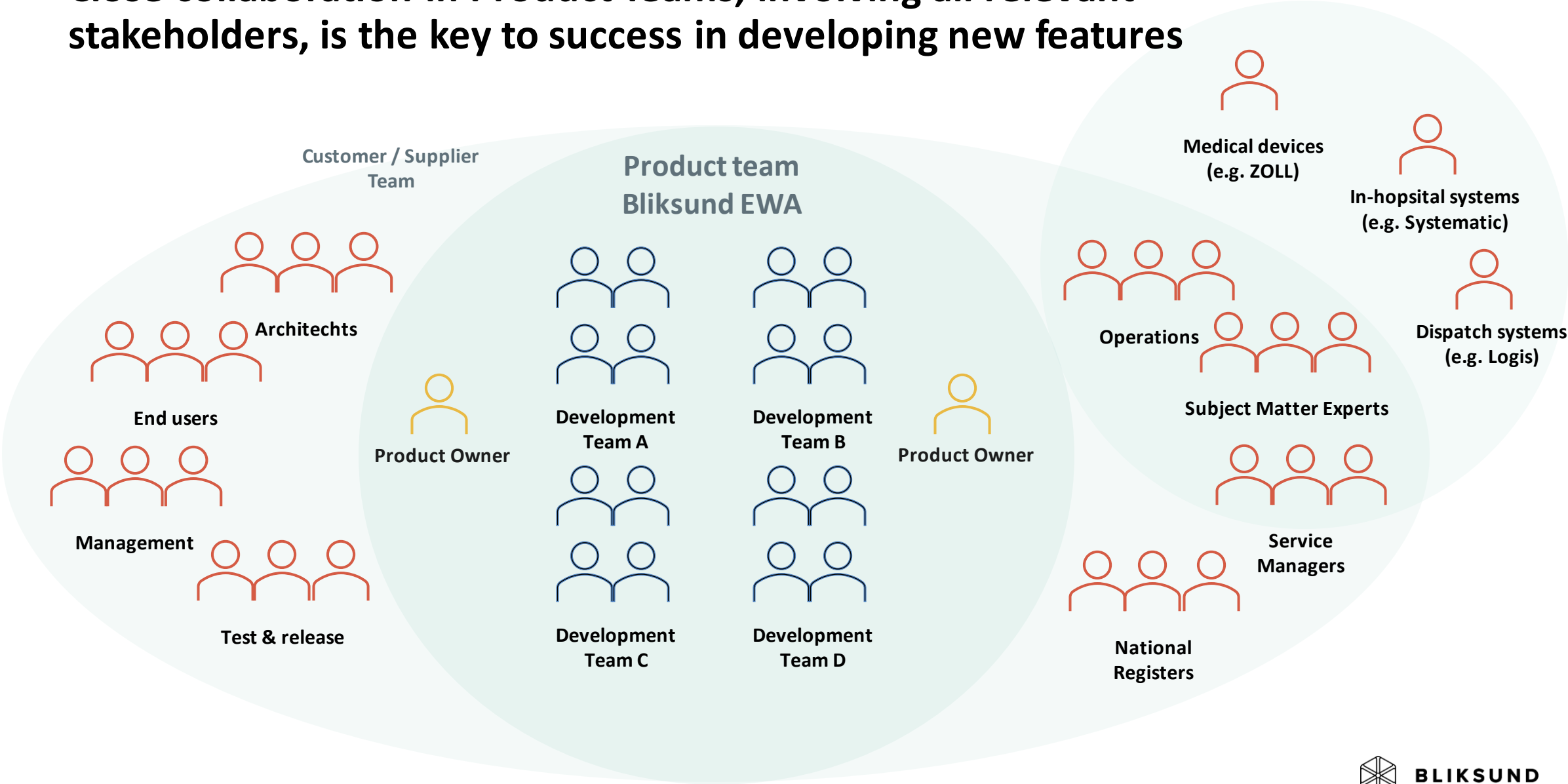


Continuous integration
Tight involvement of integration partners



More value for money
Faster value realization for the customer

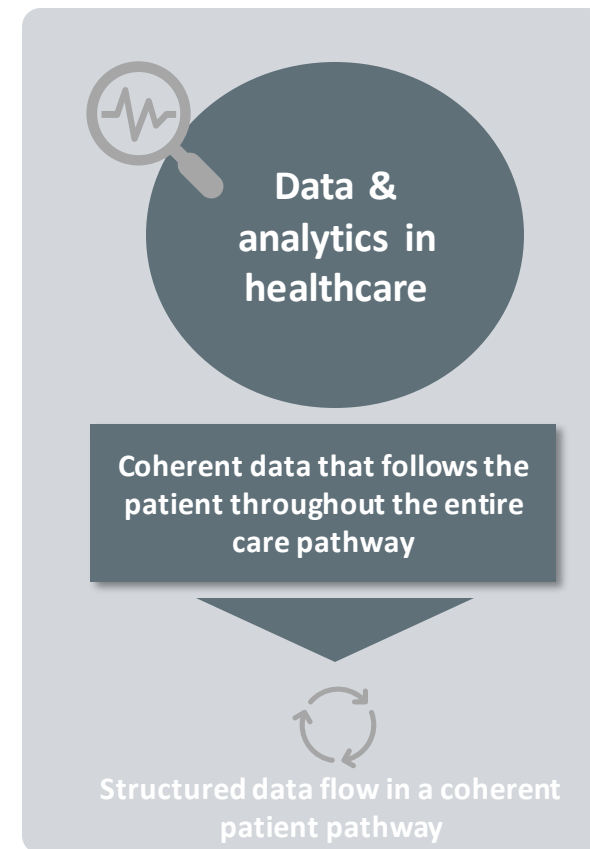
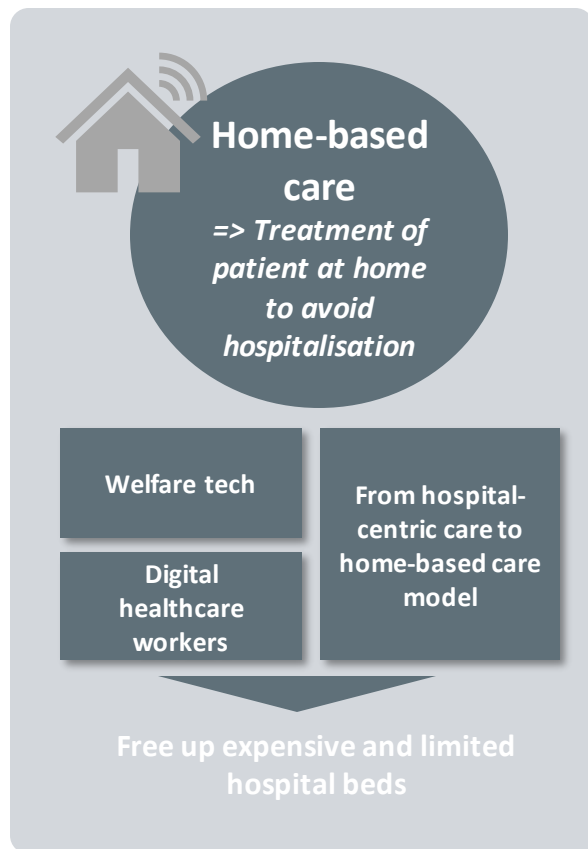
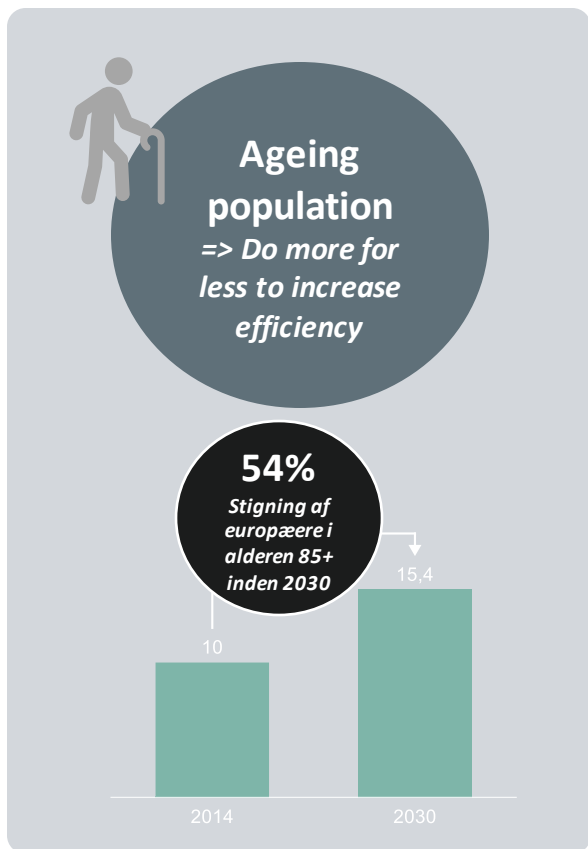
Close collaboration in Product Teams, involving all relevant stakeholders, is the key to success in developing new features



3. The future of prehospital care

- Major trends

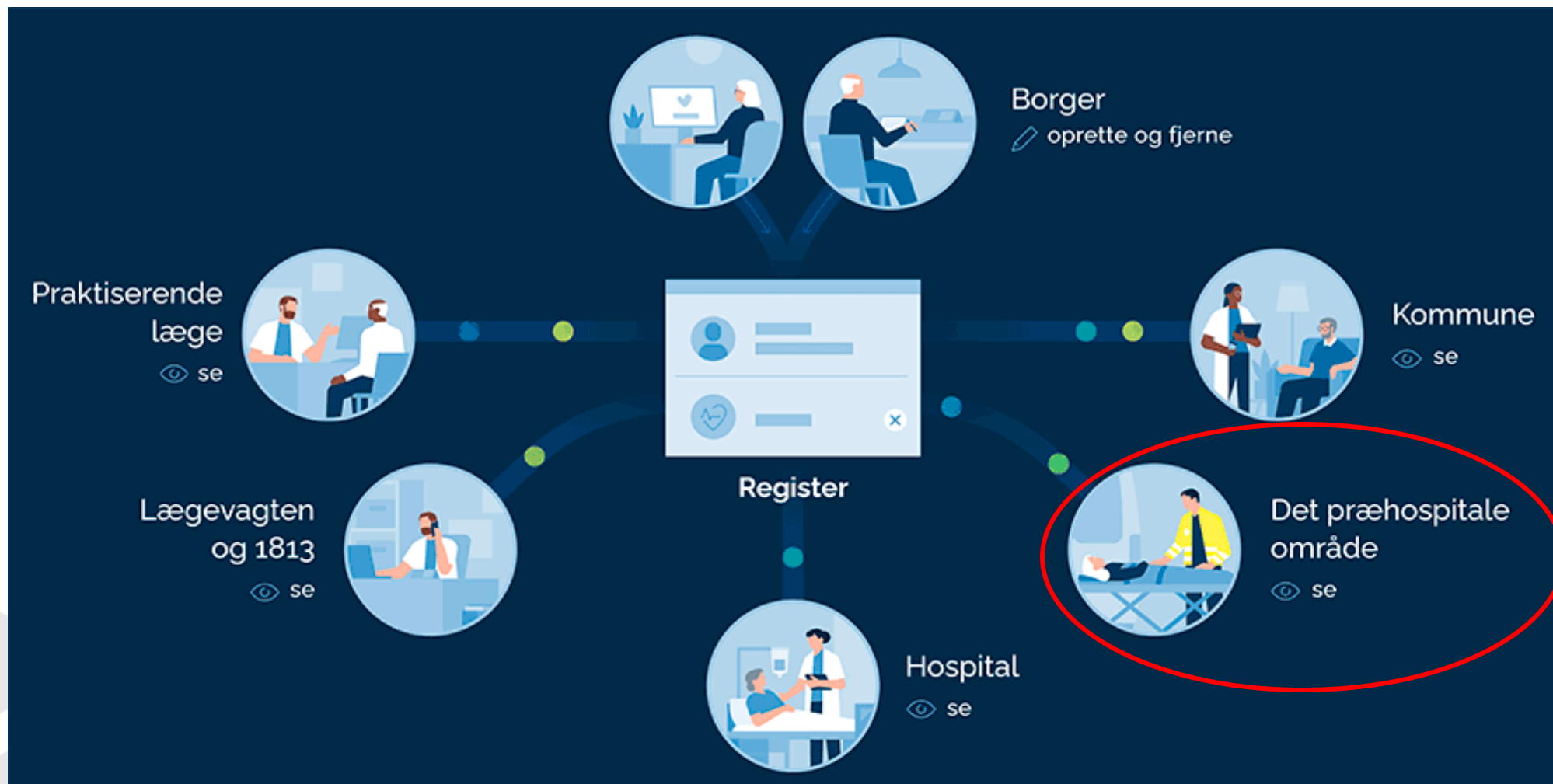
Overarching societal trends calling for increased digitalisation



Post-COVID: The global pandemic has led to increasing use of digital health solutions in the Nordics

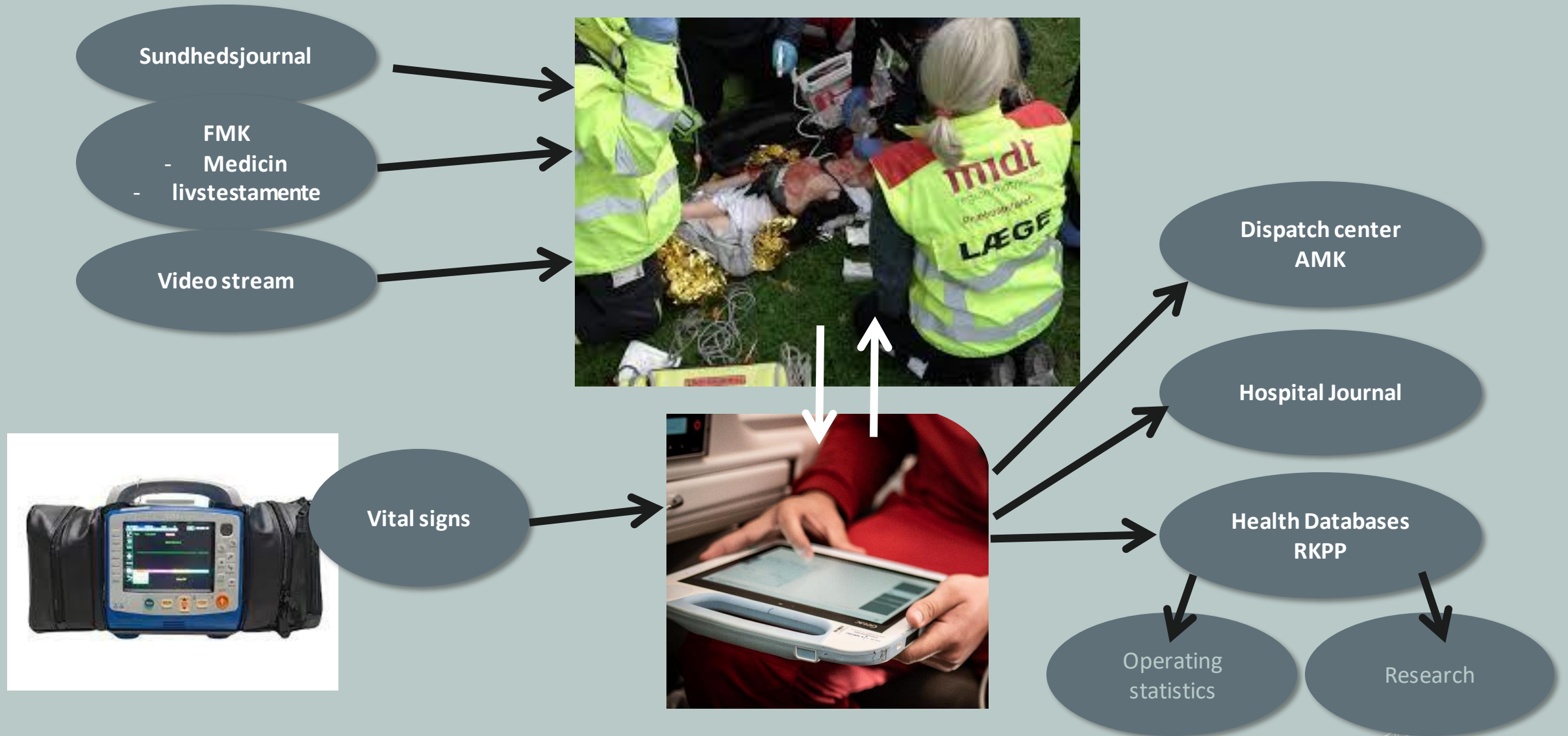
Integrative eHealth Ecosystem

Unifying IT Systems for Total Health Management"



EPCR as The Prehospital Integration Hub

"Enhancing Decision-Making for Optimal Patient Care within the Total Health System"



EPCR as The Prehospital Integration Hub

"Enhancing Decision-Making for Optimal Patient Care within the Total Health System"



Lot of 'Home-made' solutions for the daily practice

Minimal
information
about the
patient

Lack of access to registered patient information

- **Registered information**

- Sundhedsjournal
 - COVID information
- FMK – medicin
- FMK - livsstatemante
- Lab.information
- General practitioner journal

- **Consequences**

- Inaccurate diagnoses, inappropriate treatments, or the repetition of tests or procedures
- Adverse drug reactions - CAVE
- The patient appears worse than he appears – ex. COLD,
- Resuscitation against their will

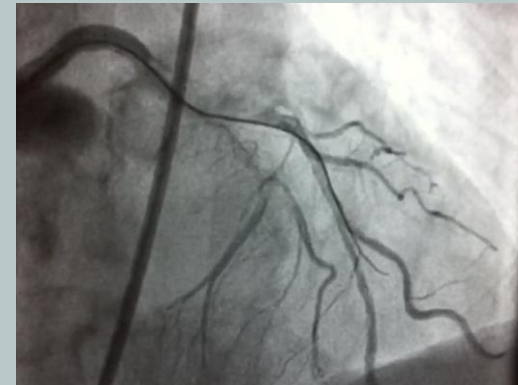
Missing data
from prehospital
records

'Missing' data from prehospital records

- **Prehospital data**
 - Registered in 'offline' database
 - No central registration national databes – RKKP
 - Treatment on scene not recorded
 - Fully treated patients on scene not registred
- **Consequences**
 - Lack of statistics to plan operations
 - Lack of statistics for health decisons

'Home-made' solutions and systems that works

- Trauma teams – PIT stop
- Patients with myocardial infarction
- Patients with stroke



'Home-made' solutions and systems that works

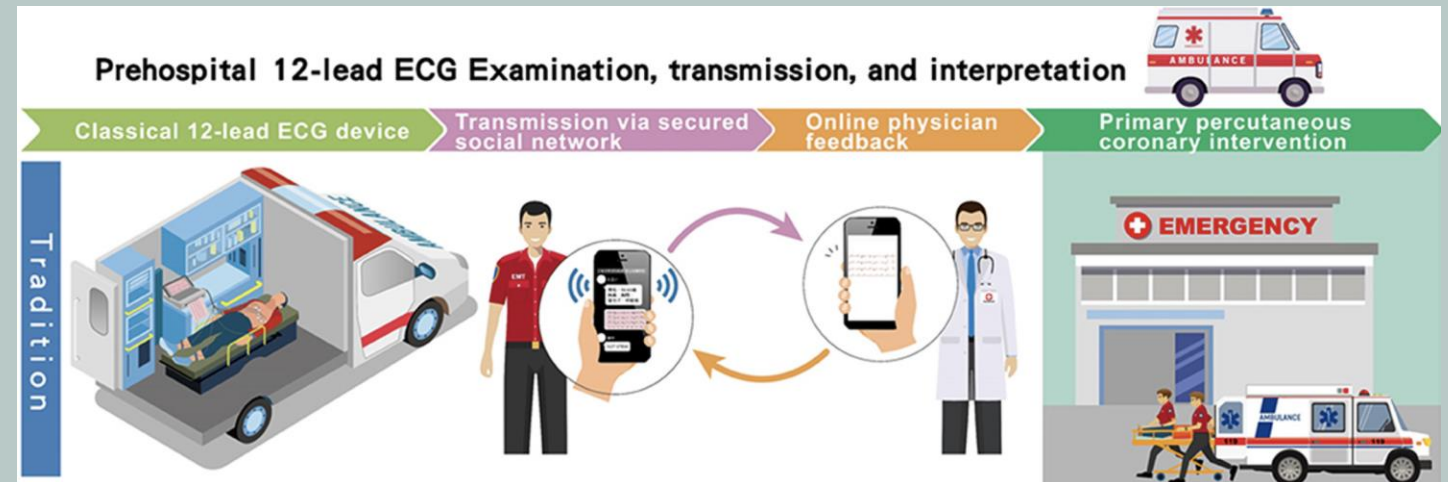
- Journal systems for prehospital services
- Akutlægebil
- HEMS project 2010-11
- Made by prehospital physicians for physicians
- The statistical foundation for the establishment of the national prehospital units
 - Akutlægebiler
 - Akutlægehelikopter - HEMS



Telemedicine as triage tool and decision support

Tele-medicine: ECG

- Tele ECG
- To facilitate patient triage for timely reperfusion therapy (PCI)
- Isolated transmission from ECG monitor directly to cardiologist
- 'Isolated information' - not part of the whole picture
- Future: Integrated into ePCR



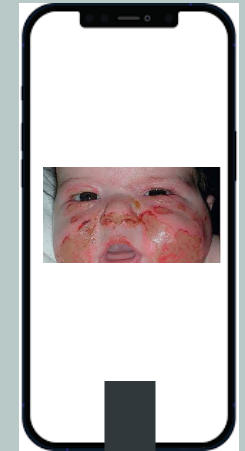
Tele-medicine: Burns

- To facilitate patient triage for right hospital
 - Small burns → local hospital
 - Complicated burns →
- Conference between prehospital and hospital doctors
- No good solutions currently
- Uses own phones - because it works !
- Future: Integrated into ePCR

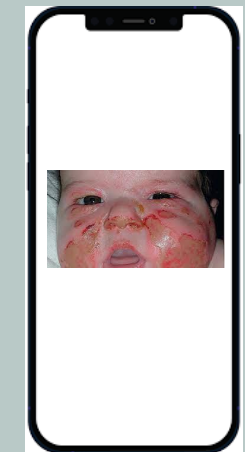
Telemedicine as
triage tool
and decision
support



Prehospital Doc



Burn Doc





Advances in medical devices & PoC Tech

- Point of Care Technology and sensors are developing rapidly, with smaller, smarter and connected devices
- This trend is especially relevant to the pre-hospital area, where space is limited in ambulances and helicopters
- ePCR solutions, as pre-hospital integration platforms, need to easily integrate with new PoC equipment
- Data from PoC equipment need to be streamed, stored and shared easily, in order to follow the patient in the care chain



Use of point of care ultrasound

- See what is hidden for the human eye
- Go from guessing to knowing
- Make correct diagnoses
 - Right treatment
 - Right triage
- Ultrasound equipment gets mobile and cheaper
- Challenge:
 - Implementation among physicians not used to ultrasound
 - Telemedicine for evaluating findings

Point of
care
ultrasound

Use of point of care ultrasound

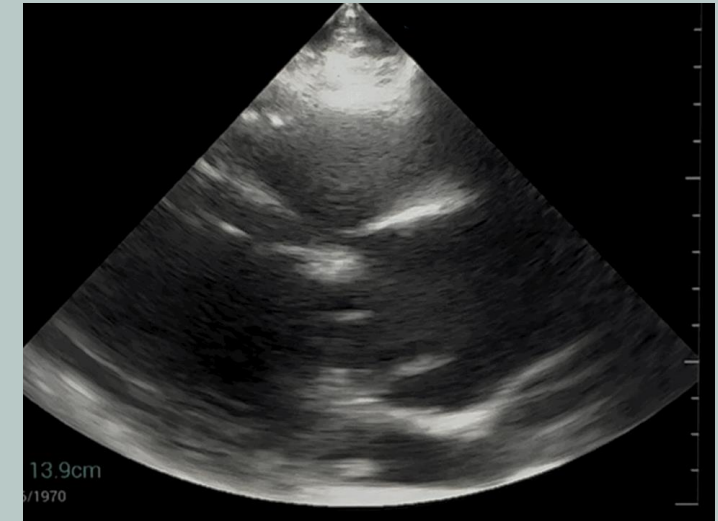
- **Example – abdominal pain**
- 70-year old woman, suddenly upper abdominal pain
- Potential diagnosis: Stomach ulcer, heart attack, gallstone attack, Kidney stone, Aorta
- From the outside of the patient no difference
- Each diagnose needs different treatment and triage.
- Ultrasound showed abdominal aortic aneurism
- Patient were admitted directly to operation



Point of
care
ultrasound

Use of point of care ultrasound

- **Example – Stroke**
- 58-male, no former disease
- Suddenly cerebral stroke with hemiparesis and aphasia
- 'Normally' referred to neurological department for medical or invasive treatment
- Ultrasound of the heart showed aortic dissection
- Patient transported to emergency heart surgery





Five technological areas that will shape future of prehospital care

ePCR as the
prehospital
integration
hub

Advances in
medical
devices &
PoC Tech

Video
streaming

Data &
analytics

Decision
Support -
Emergency
Worker
Assistant

ePCR as the prehospital integration hub, enabling a coherent patient pathway

- Trend from large monolithic systems to best-of-breed, open systems and platforms
- ePCR solutions need to be strong integration platform designed for two-way communication
- A wide array of systems to integrate with in the emergency care chain, e.g., in-hospital medical records, emergency departments logistics, national systems/registers, municipal systems, GPs, home nurses etc.

ePCR as the
prehospital
integration
hub



Det Centrale Personregister



SYSTEMATIC

**SUNDHEDS
PLATFORMEN**

sundhed.dk



medcom

ZOLL  **MASIMO**

 **corpuls**  **LIFEPAK**

PHILIPS

Video
streaming



Vestre Viken HF

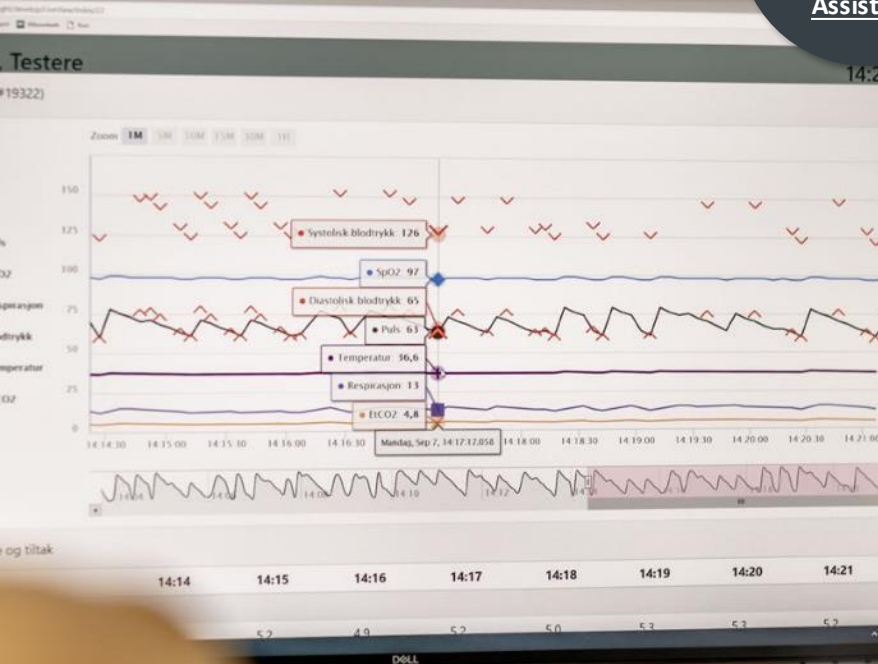
Video streaming

- Covid-19 has accelerated the adoption of video in the healthcare domain, which will be further accelerated by the adoption of 5G
- Valuable and necessary decision support tool in the entire emergency care chain, e.g. between AMK and caller, paramedic and in-hospital consulting doctor
- Value from seeing and preparing before arriving at the scene, as well as creating common situational awareness
- Bliksund EWA has video streaming as part of the offering, and long-standing experience from e.g. AMK in Norway, Region Syd & Hovedstadens Beredskab

Data & analytics

- Advances in data and analysis of large data sets, as well as machine learning and artificial intelligence in all industries
- Business intelligence, integrated dashboards with data for company management and operational reporting to management level
- Measurement and follow-up of quality parameters
- Extraction of larger & consistent datasets for research purposes





Decision Support - Emergency Worker Assistant

- In line with the tendency towards increased use of data and analysis, machine learning and AI algorithms are also progressing
- Our long-term vision with EWA is to develop an intelligent assistant for actors in the entire pre-hospital chain
- Decision support in the form of e.g. medically approved alerting algorithms based on various criteria, such as sepsis, stroke and more
- The solution must support pre-hospital staff and be adapted to the level of education and authorization

4. Conclusion





Collaboration across the municipal, pre-hospital and in-hospital sector

- Long-term partnerships and collaboration with customers and integration partners provide the best solutions
- Our solutions are developed in agile loops, in close dialogue with the customers and other relevant suppliers, such as in-hospital record systems, medical equipment, national registers, etc.
- Several technological trends will affect the pre-hospital area in the future, calling for innovative sponsors
- **Together we create the best solutions for the future, and a coherent patient pathway, across municipal, pre-hospital and in-hospital borders**

Thank you for your attention



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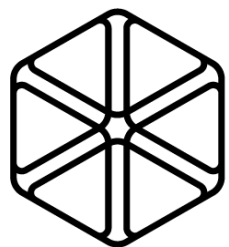


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