Implementing the Norwegian COPD pilot:

Lessons Learned and Success factors for future Scale-up

3rd Momentum workshop, 15 May 2014, Athens

Rune Fensli
Professor/Research Manager
Centre of eHealth and Health Care Technology
University of Agder
N-4898 Grimstad, Norway
Phone: +47 37 23 30 00/ +47 913 05 222
e-mail: rune.fensli@uia.no

www.united4health.no
www.united4health.eu

Outline

- The underlying deployment principles for the Norwegian trials
- The Norwegian Health Care Reform, 2012
- Point-of-Care Services for COPD – ICT solutions
- Participatory design involving end-users/ Usability evaluations
- Lessons learned /Critical Success Factors:
  - Strategy and Management (SIG 1)
  - Organization and Change Management (SIG 2)
  - Legal, Regulatory and Security Issues (SIG 3)
  - Technical Infrastructure and Market Regulations (SIG 4)
- Experiences from test-period with patients
  - Test patient's experiences
  - Scaling up challenges
  - Research plans and Plans for future deployment

The Agder Region in Norway

- Population: 292 225 inhabitants
- Area: 16 493 km^2
- 2 Counties
- 30 Municipalities
  - Smallest: Bykle – 929 inhabitants
  - Largest: Kristiansand – 84.476 inhabit.
  - Coastline with high population density
  - Inland/mountains as rural areas

eHealth UNIVERSITY OF AGDER SØRLANDET SYKEHUS Kristiansand

www.united4health.no
www.united4health.eu

Underlying principles

- Adapting new COPD follow-up in existing health care services according to the Norwegian regulations
- Establishing clinical procedures in collaboration between
  - Hospital – Municipality health care services – General Practitioner
- Revising the Patient Treatment Flow Procedures
- Shared access to medical information according to legal requirements and security policies
- Implementing new technology into existing infrastructure within the secured Norwegian Health Network

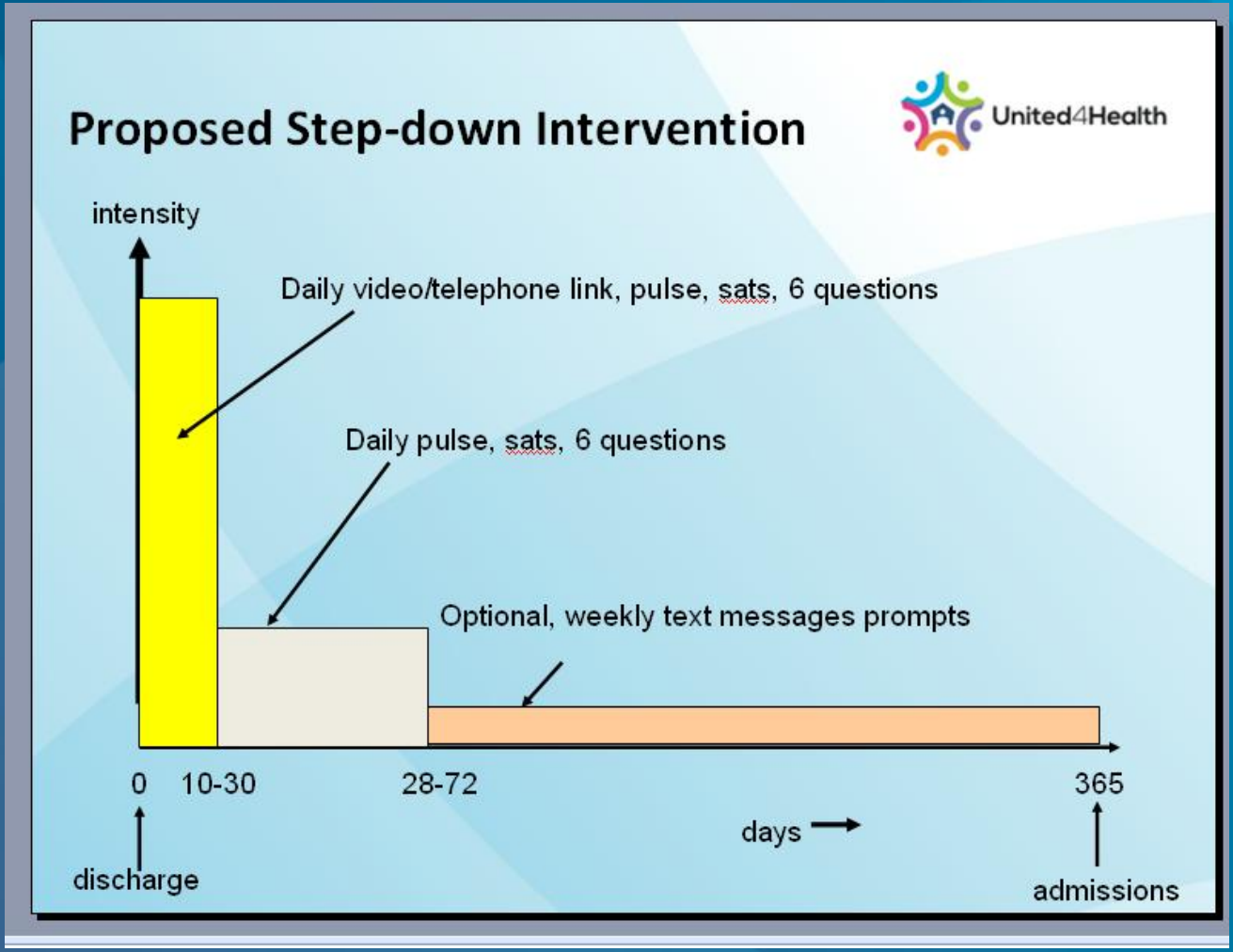
The Norwegian Health Care Reform (from 2012)

United4Health

- Reorganization of the Norwegian health care services
  - Governmental report “The Coordination Reform” no 47 (2008-2009)
- After hospital discharge:
  - Patient follow-up by General Practitioner and the municipality home health care services
  - *“Proper treatment - at the right place and right time”*
  - Hospital specialist competence will assist when needed
- Information exchange based on electronic messages
  - Dedicated Norwegian standard specifications

COPD Research Protocol

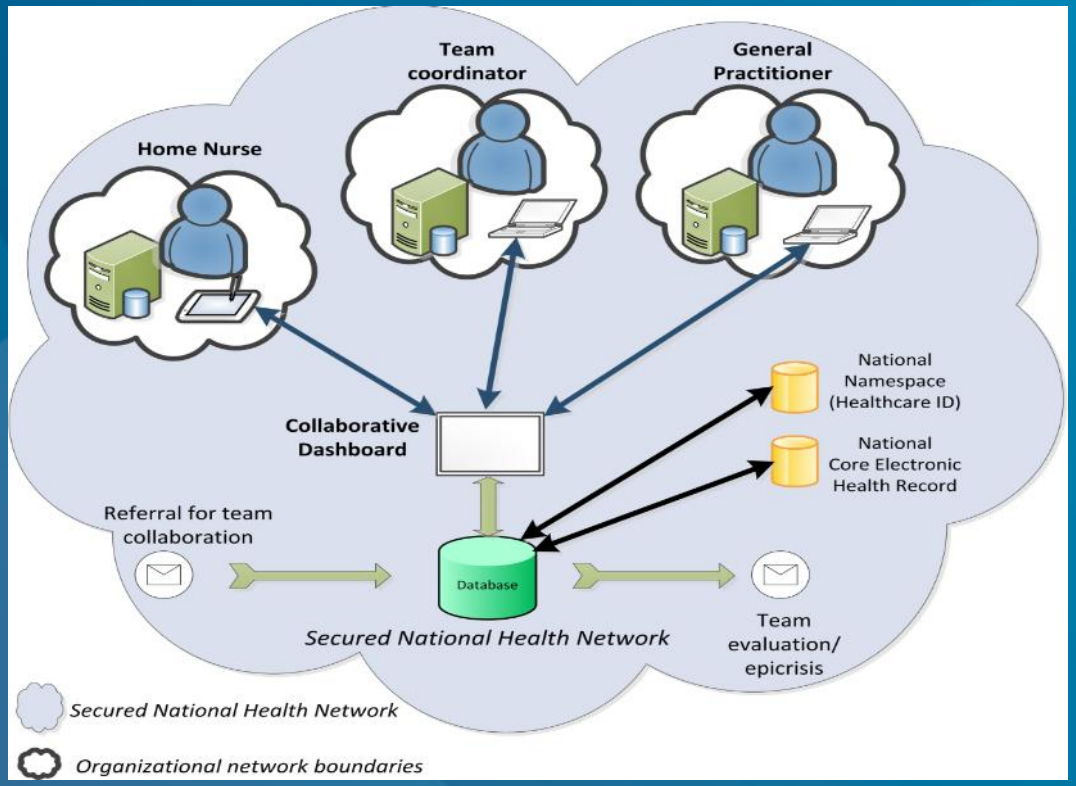
United4Health



eHealth UNIVERSITY OF AGDER SØRLANDET SYKEHUS Kristiansand

www.united4health.no
www.united4health.eu

Treatment Pathway Health Record

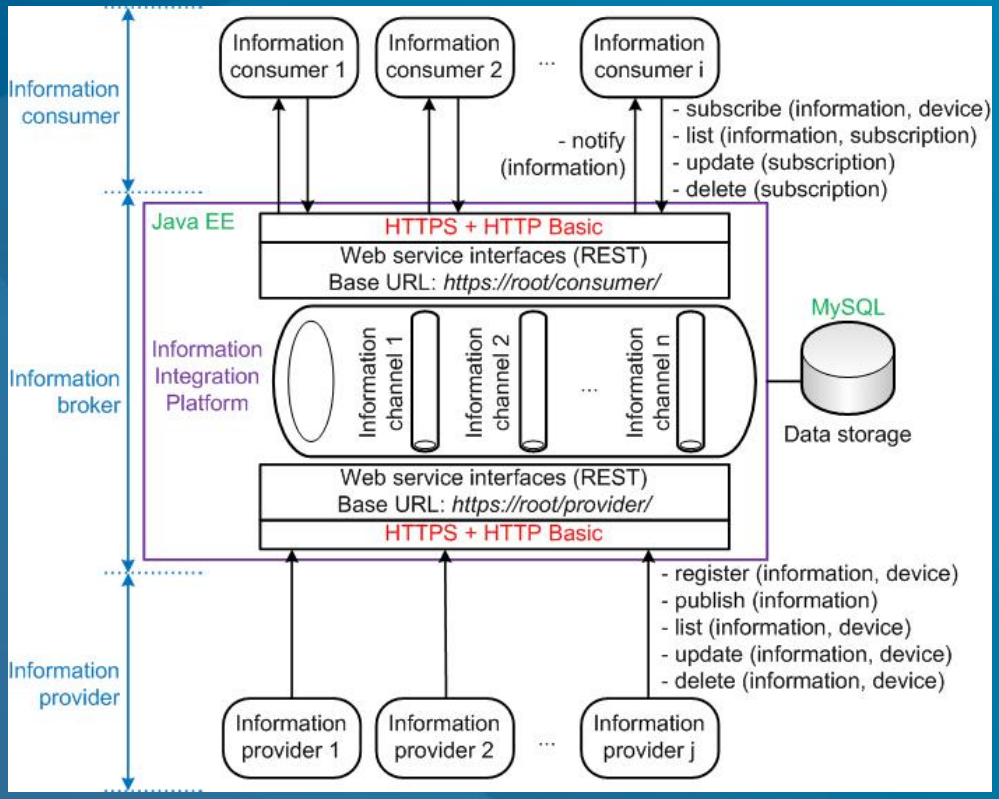


Fensli R, Holen-Rabbersvik E, Thygesen, E. Shared Access to Electronic Health records for Inter-organizational Care Teams using a Treatment Pathway Health Record. A case study.
BMC Medical Informatics and Decision Making, (accepted for publication).

- Based on the Norwegian Coordination Reform
- Developed in research projects at University of Agder
- Shared access according to legal regulations from 01.01-2015

Information Integration Portal

- Open integration of TeleHealth and TeleCare devices



Developed by University of Agder

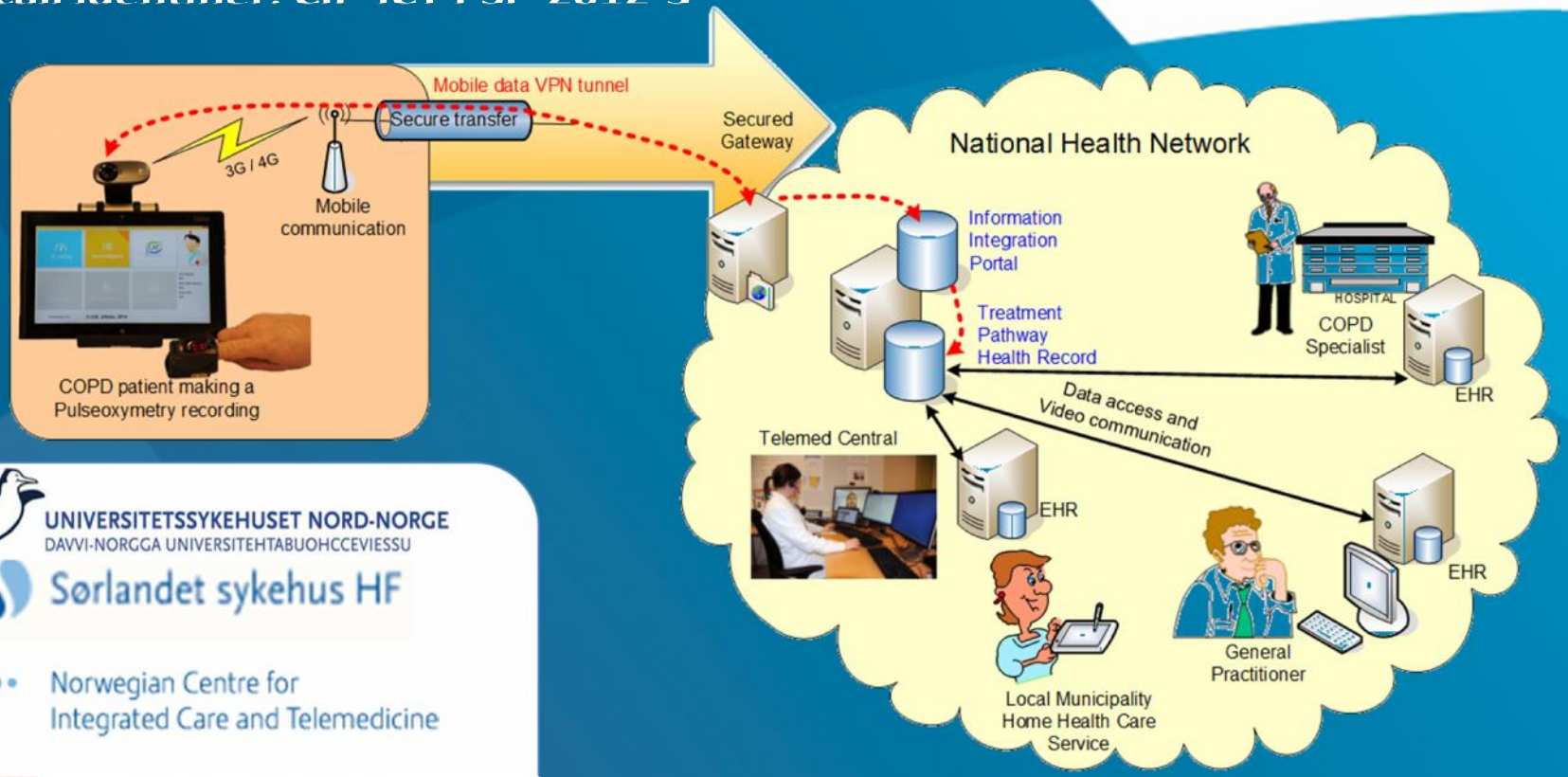
eHealth · UNIVERSITY OF AGDER · SØRLANDET SYKEHUS · Kristiansand

www.united4health.no
www.united4health.eu

UNIversal solutions in Telemedicine Deployment for European HEALTH care, 2013-2015

ICT PSP call identifier: CIP-ICT PSP-2012-3

United4Health



UNIVERSITETSSYKEHUSET NORD-NORGE
DAVVI-NORGGA UNIVERSITEHTABUOHCCEVIESSU
Sørlandet sykehus HF
Norwegian Centre for Integrated Care and Telemedicine
NST
UNIVERSITY OF AGDER

- Point-of-Care Services Agder.
  - Sub-Project financed by the Research Council of Norway, 2013-15
- eHealth – Extended Care Coordination.
  - Synergy Project financed by the Agder Research Fund, 2011-2014

eHealth | UNIVERSITY OF AGDER | SØRLANDET SYKEHUS | Kristiansand

www.united4health.no
www.united4health.eu

System Requirements

…derived from the target use cases:

- Daily patient questionnaire on individual condition
- Daily measurements of certain health data (pulse, SpO2, optional:spirometry)
- Anonymized and encrypted transmission of data to treatment pathway healthcare platform; considering specific Norwegian requirement to securely connect to NHN via VPN (supported by mobile operator with dedicated APN)
- Overview of latest status of patients under remote supervision
- Follow-up support for healthcare personnel by *Triage*: status-calculation in three levels – ok (green), attention (yellow), critical (red)
- Detailed health condition data accessible per patient, incl. history throughout trial participation time (30 days)
- Video consultation (patient ⇔ telemedicine center) and conference (involving hospital specialist or GP on demand)

Patient Tablet

United4Health

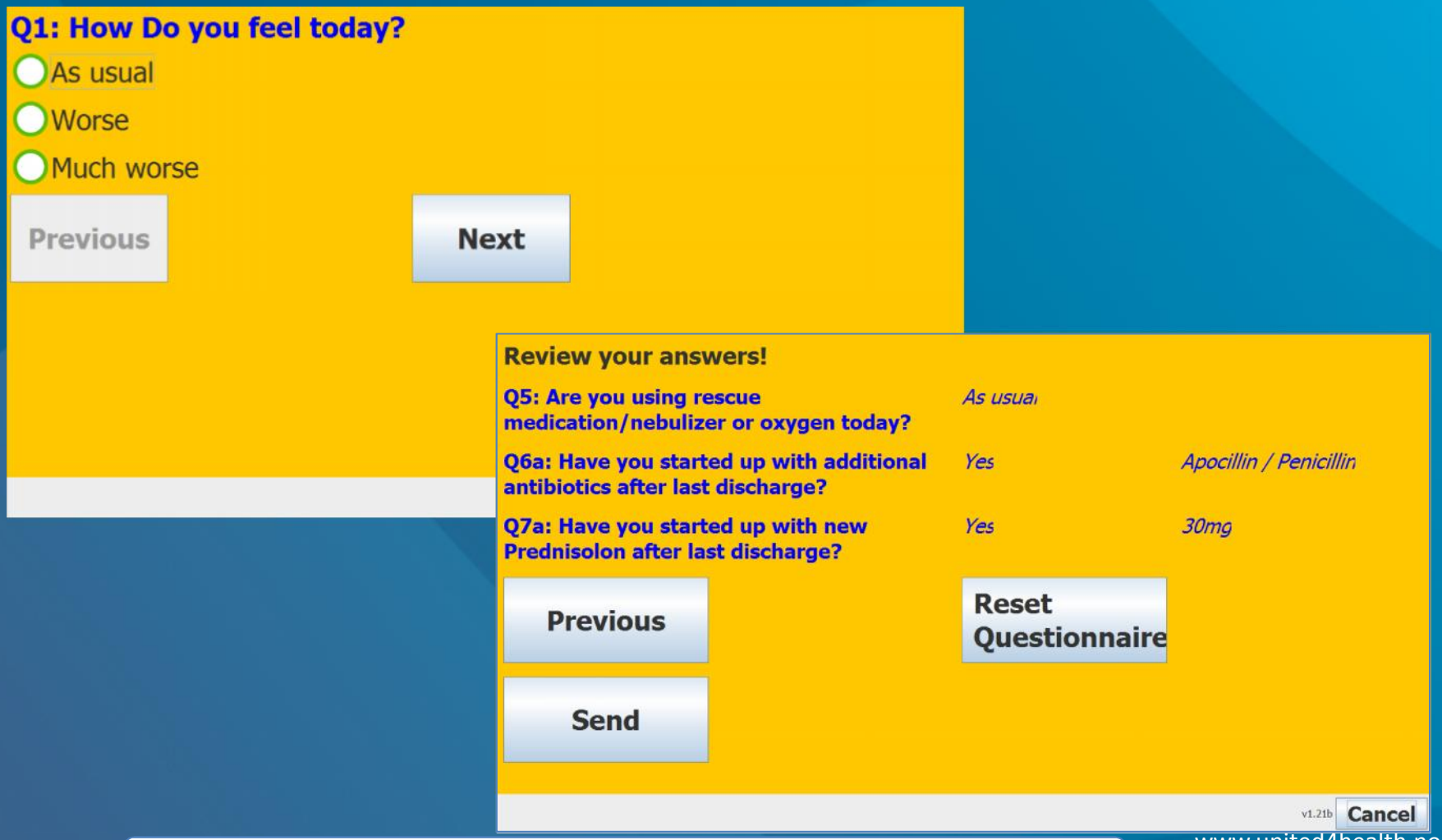
Tablet running on Windows 8.1 Pro

Based on security requirements

eHealth UNIVERSITY OF AGDER SØRLANDET SYKEHUS Kristiansand

www.united4health.no
www.united4health.eu

Daily Questionnaire



United4Health

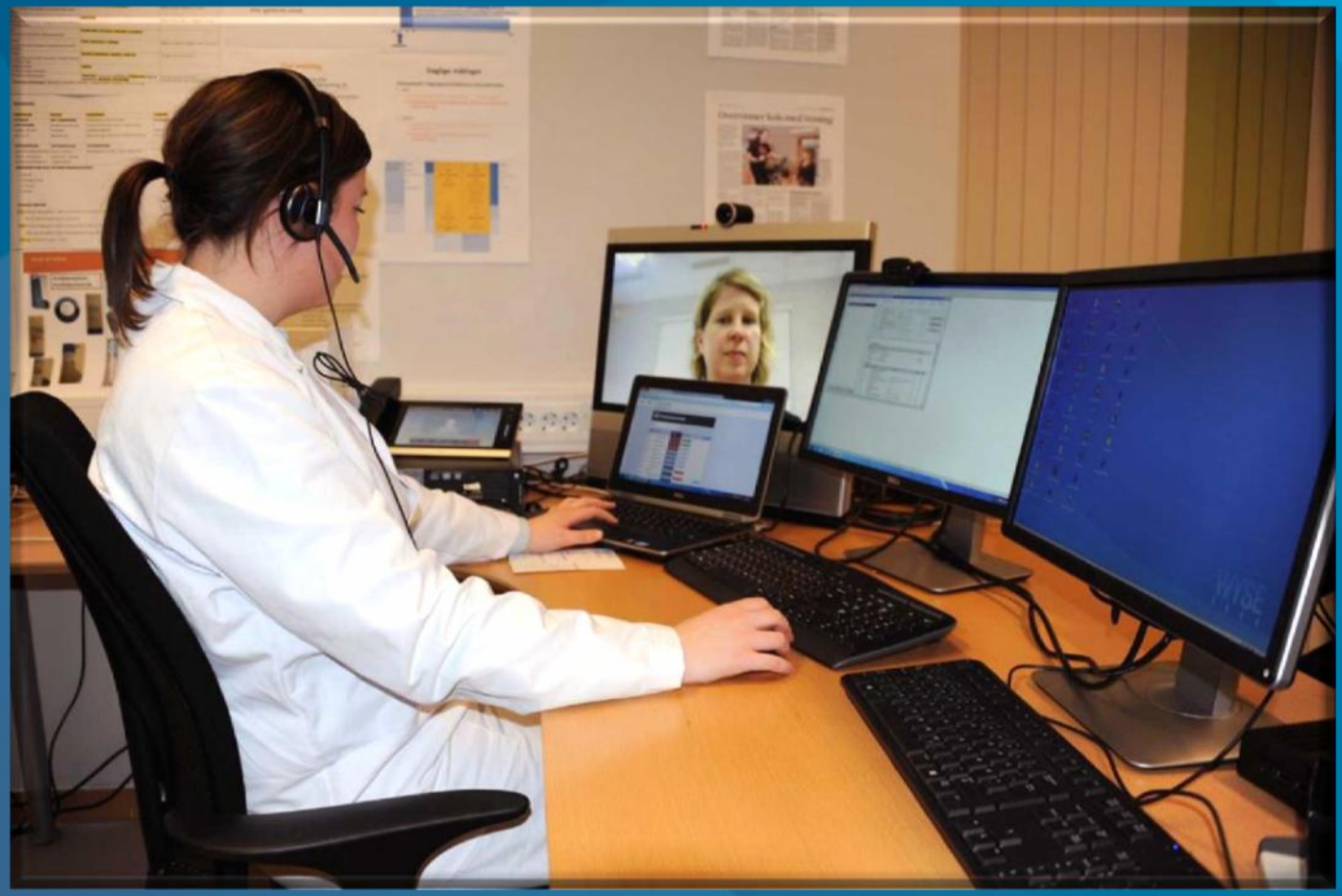
eHealth UNIVERSITY OF AGDER SØRLANDET SYKEHUS Kristiansand

www.united4health.no
www.united4health.eu

Daily Measurements

Telemedical Central

- First Pilot installation at Municipality of Kristiansand

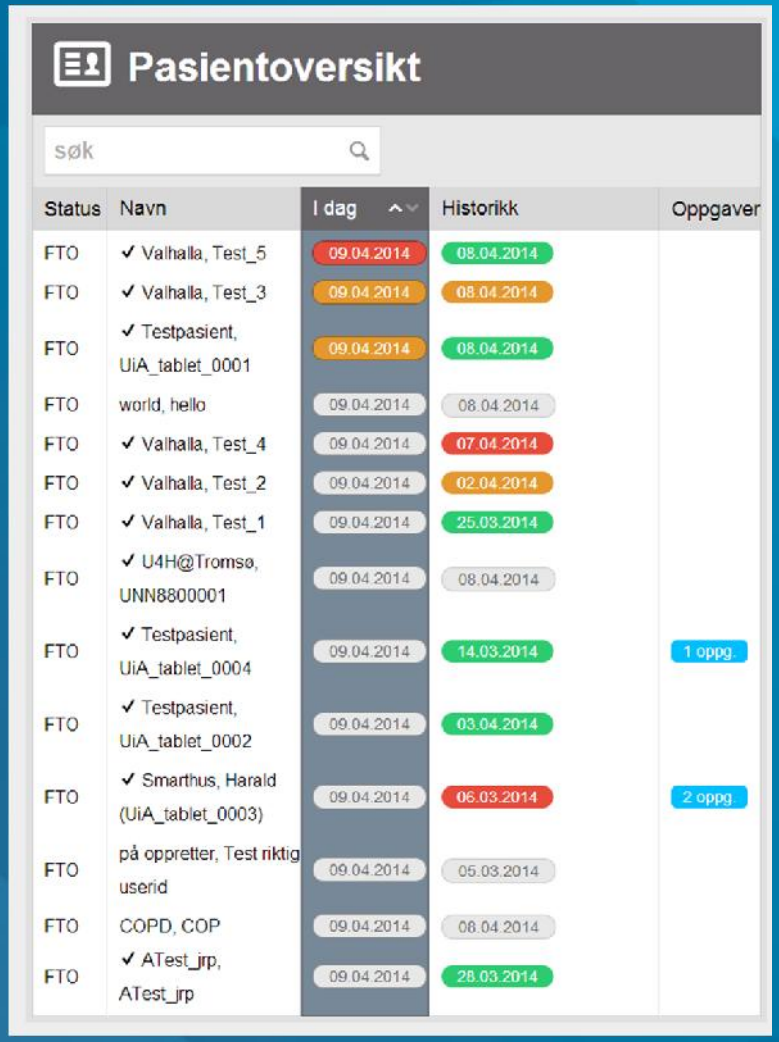


eHealth UNIVERSITY OF AGDER SØRLANDET SYKEHUS Kristiansand

www.united4health.no
www.united4health.eu

Treatment Pathway Health Record

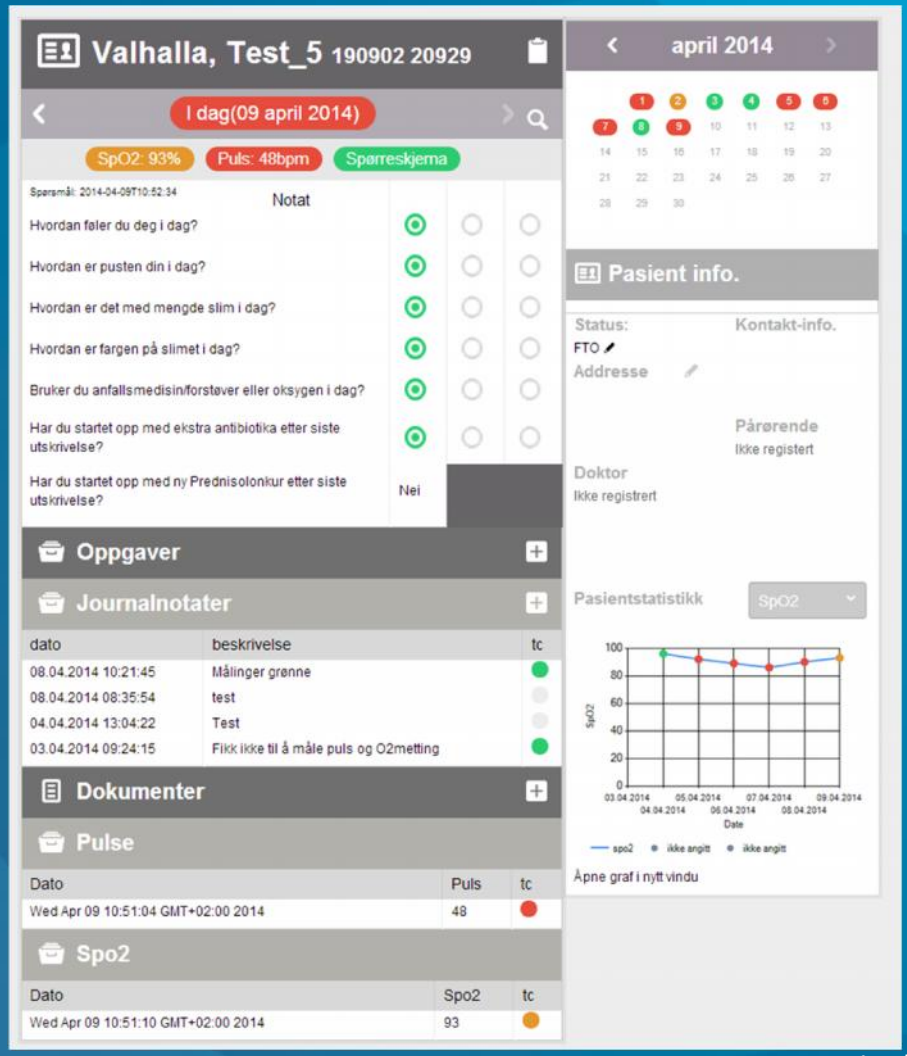
- Overview of today's patient reports, and of "history"
- Colour-coded Triage based on the reported values from the patients



Patient's Detailed Information

United4Health

- Gives an overview of Pulse + SPO2 and answers from the daily questionnaire
- Trend curves
- Journal notes can be written, important documentation of actions taken



eHealth · UNIVERSITY OF AGDER · SØRLANDET SYKEHUS · Kristiansand

www.united4health.no
www.united4health.eu

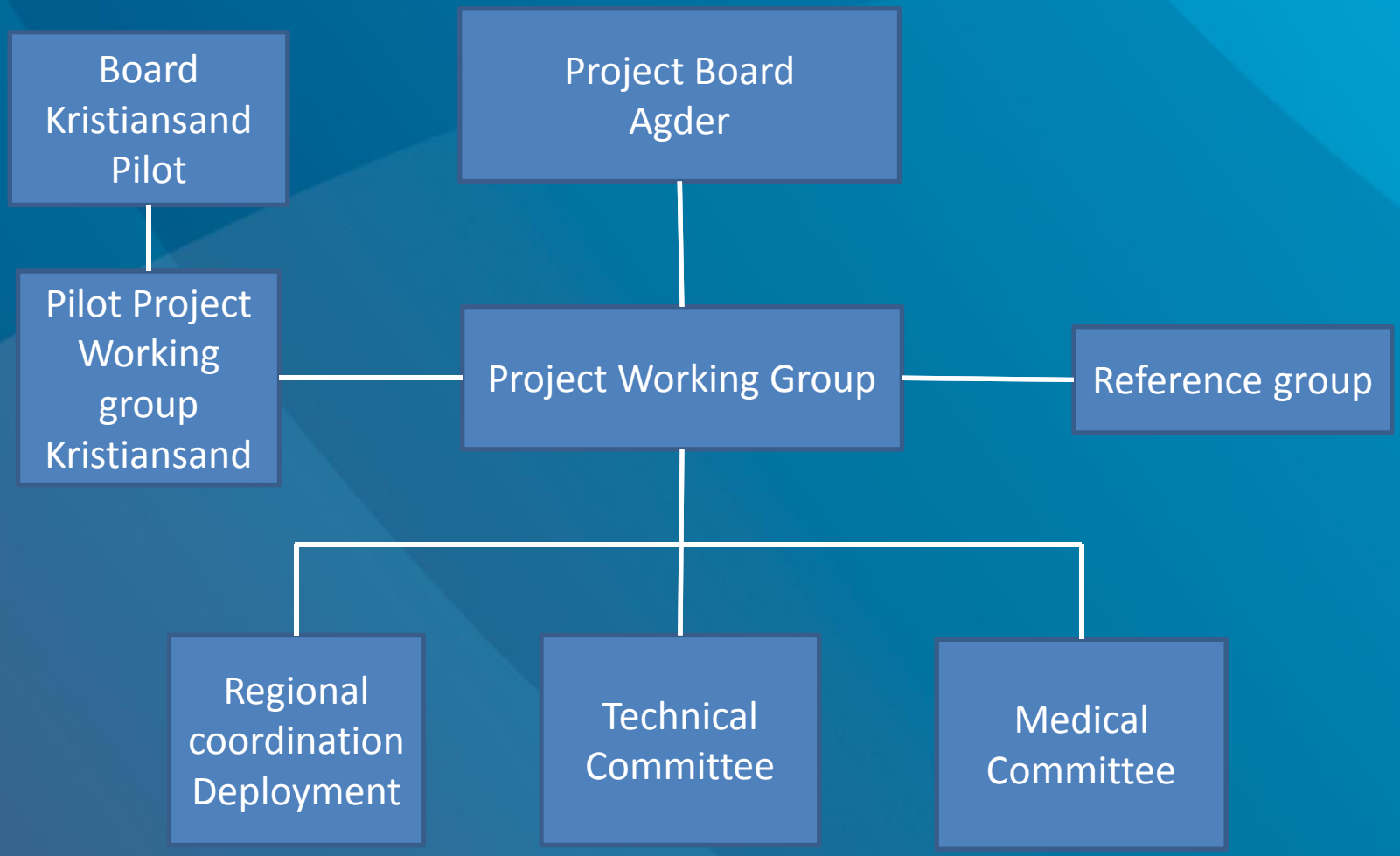
Lessons Learned

United4Health

- Strategy and Management (SIG 1)
  - Project organisation & user commitment
  - User centric design
- Organization and Change Management (SIG 2)
  - Implementing new services according to existing logistics
  - Organizational aspects in deployment of services
- Legal, Regulatory and Security Issues (SIG 3)
  - Legal aspects of shared access to medical information
  - Security aspects within a National Health Network
- Technical Infrastructure and Market Regulations (SIG 4)
  - Implementing services within a secured National Health Network
- Experiences from test-period with patients
  - Test patient's experiences
  - Scaling up challenges
  - Research plans and Plans for future deployments

Strategy and Management (SIG 1)

Project Organization & User Commitment



United4Health

eHealth UNIVERSITY OF AGDER SØRLANDET SYKEHUS Kristiansand

www.united4health.no
www.united4health.eu

Strategy and Management (SIG 1)
User Centric Design

United4Health

- Involvement of doctors, nurses, technical personnel and representations from COPD patients
- Defining user needs and software specifications
- Actively involved in lab-tests of prototypes

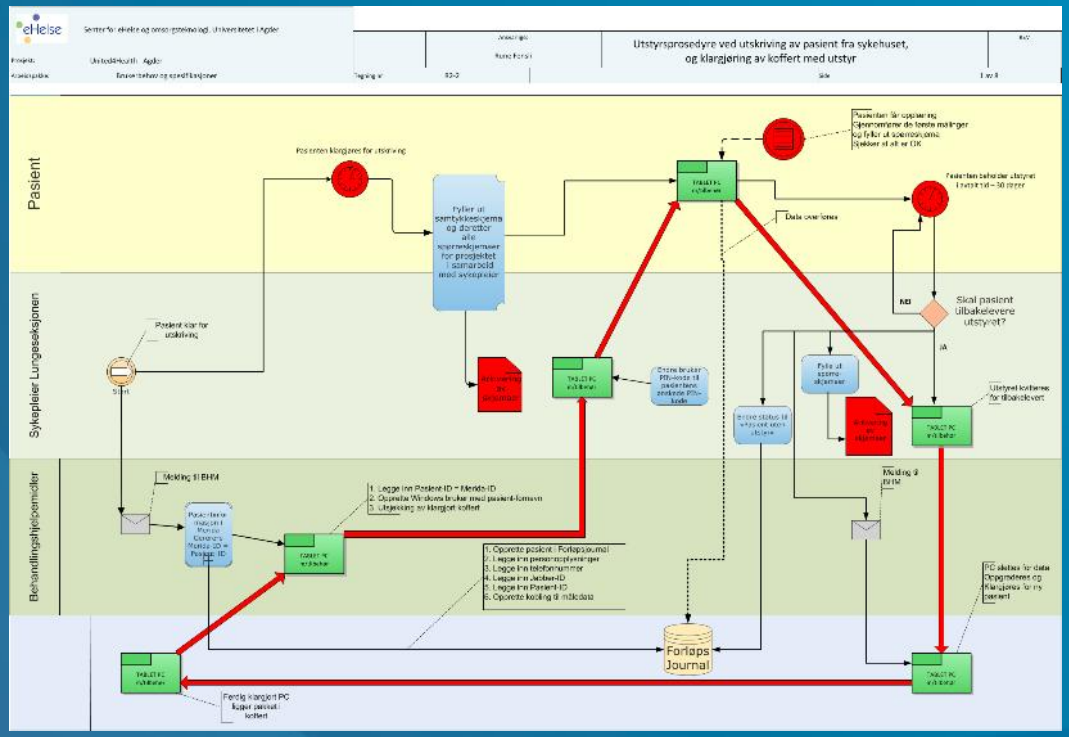
eHealth UNIVERSITY OF AGDER SØRLANDET SYKEHUS Kristiansand

www.united4health.no
www.united4health.eu

Organization and Change Management (SIG 2)

Integrating new services according to existing logistics

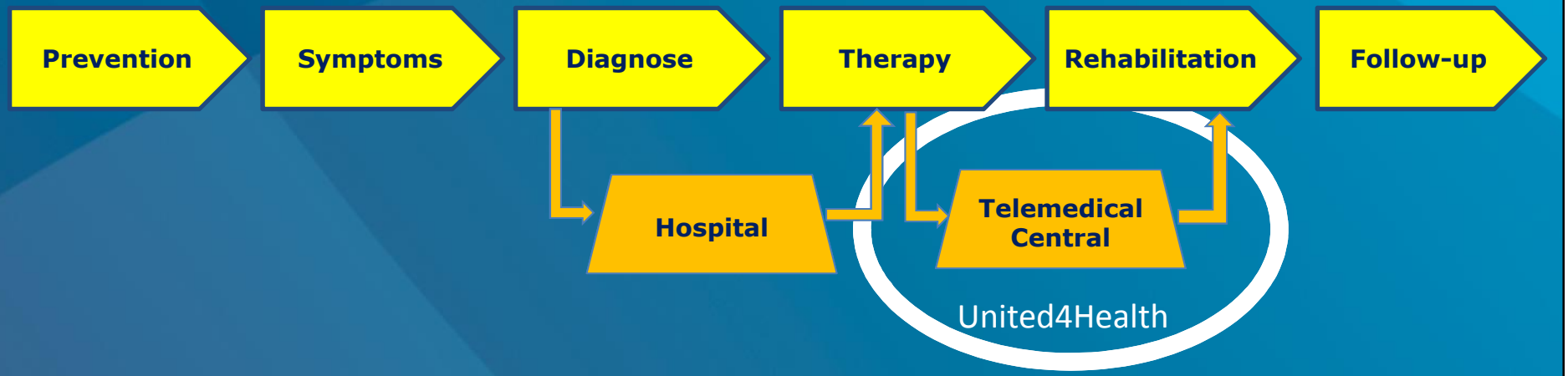
- Process diagrams for handling the patient suitcase with all necessary equipment, including configuration



eHealth UNIVERSITY OF AGDER SØRLANDET SYKEHUS Kristiansand

www.united4health.no
www.united4health.eu

Organization and Change Management (SIG 2)
New Clinical COPD Pathway

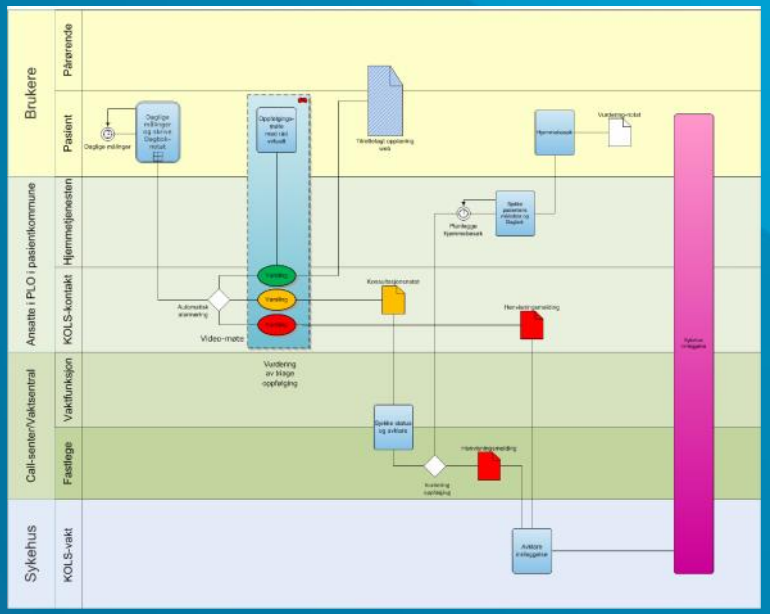


- Clinical interventions at Telemedical Central had to be developed and implemented
- Training of qualified nurses in COPD specialization

Organization and Change Management (SIG 2)

Organizational aspects in deployment of services

- Implementing Triage methods
  - New for municipality health care
- Procedures for daily follow-up
- Involvement of Local Doctor
  - Difficult to achieve commitments
- Regional services at Telemedicine Central
  - Medical responsibility and operating costs to be defined



Procedures at Telemedical Sentral
RED – Doctors evaluation needed
YELLOW – Interventions required
GREEN – as usual (normal day)

eHealth UNIVERSITY OF AGDER SØRLANDET SYKEHUS Kristiansand

www.united4health.no
www.united4health.eu

Legal, Regulatory and Security Issues (SIG 3)
Legal Aspects

United4Health

- Today:
  - Shared access to medical information is prohibited
- Project specifications:
  - The developed ICT solution is designed for shared access
  - Important function based in the Norwegian Health Care reform
- Future legal changes:
  - Changes in laws is expected within end on June 2014
  - The developed ICT solution can be deployed as planned

Legal, Regulatory and Security Issues (SIG 3)

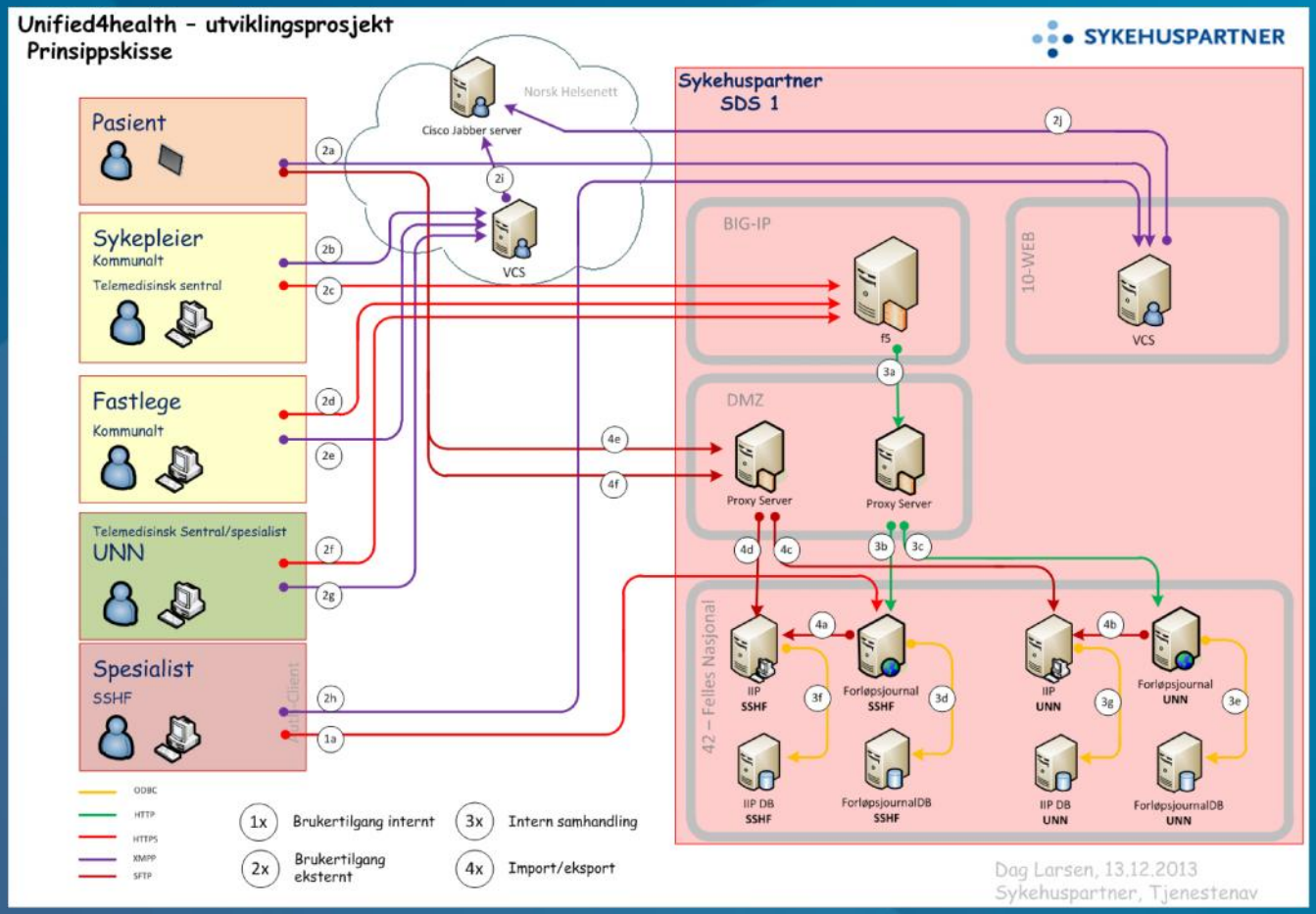
Security Aspects

United4Health

- Strict requirements for ICT security within the National Health Network
- In-depth Risk analyses carried out
  - Revealed the patient tablet to be at highest risk
  - Dedicated security software needed to prevent un-wanted use
  - Only the medical application allowed
  - No normal Windows functions available to end-user
  - Stored information is encrypted on the tablet
- De-identified information transmitted from the tablet
- Two-factor authentication methods implemented

Technical Infrastructure and Market Regulations (SIG 4)

Implementing Services within a National Health Network



- Sykehuspartner is the IT-department for all hospitals in South-Norway
- All communications and data storage within the secured Norwegian Health Network
- Several stakeholders with different priorities

www.united4health.no
www.united4health.eu

Technical Infrastructure and Market Regulations (SIG 4)

Risk & Security Analyses and Implemented Routines

United4Health

- Risk and Security Analyses carried out according to legal requirements for access to the Norwegian Health Network
- Software tested according to Medical Software EU-requirements
- Routines defined for authorization of persons to system access
- Routines for including a new patients at discharge from the hospital
- One-way data transfer from the patient to the Treatment Pathway Health Record, no electronic feedback to the patient
  - Future plans for incorporating the services to the Norwegian Health Portal
- Upon closing down the services, patient data will be stored within existing EHR systems according to established routines
- The hospital is the owner of patients equipment (purchase responsible)

Technical Infrastructure and Market Regulations (SIG 4)
Purchasing of equipment

United4Health

- Video equipment's has been delivered from the National Health Network – Cisco Jabber
- Software: (Tablet software and Treatment Pathway Health Record)
  - Developed within the project together with partners
- Patient suitcase:
  - PC-Tablet – ordinary purchase based on standard contracts
  - Pulseoxymeter – ordinary purchase as medical device
- No dedicated invitation to tender was necessary

Experiences from test-period with patients

Usability Evaluations and Training of patients

- A positive feedback
- Patients are technical experienced (also elderly patients)
- Video meetings with trained COPD-nurses are valuable
- Can be difficult to “tap” on tablets
- Training is needed to understand and correctly fill in questionnaires
- Technical support at home needed

United4Health

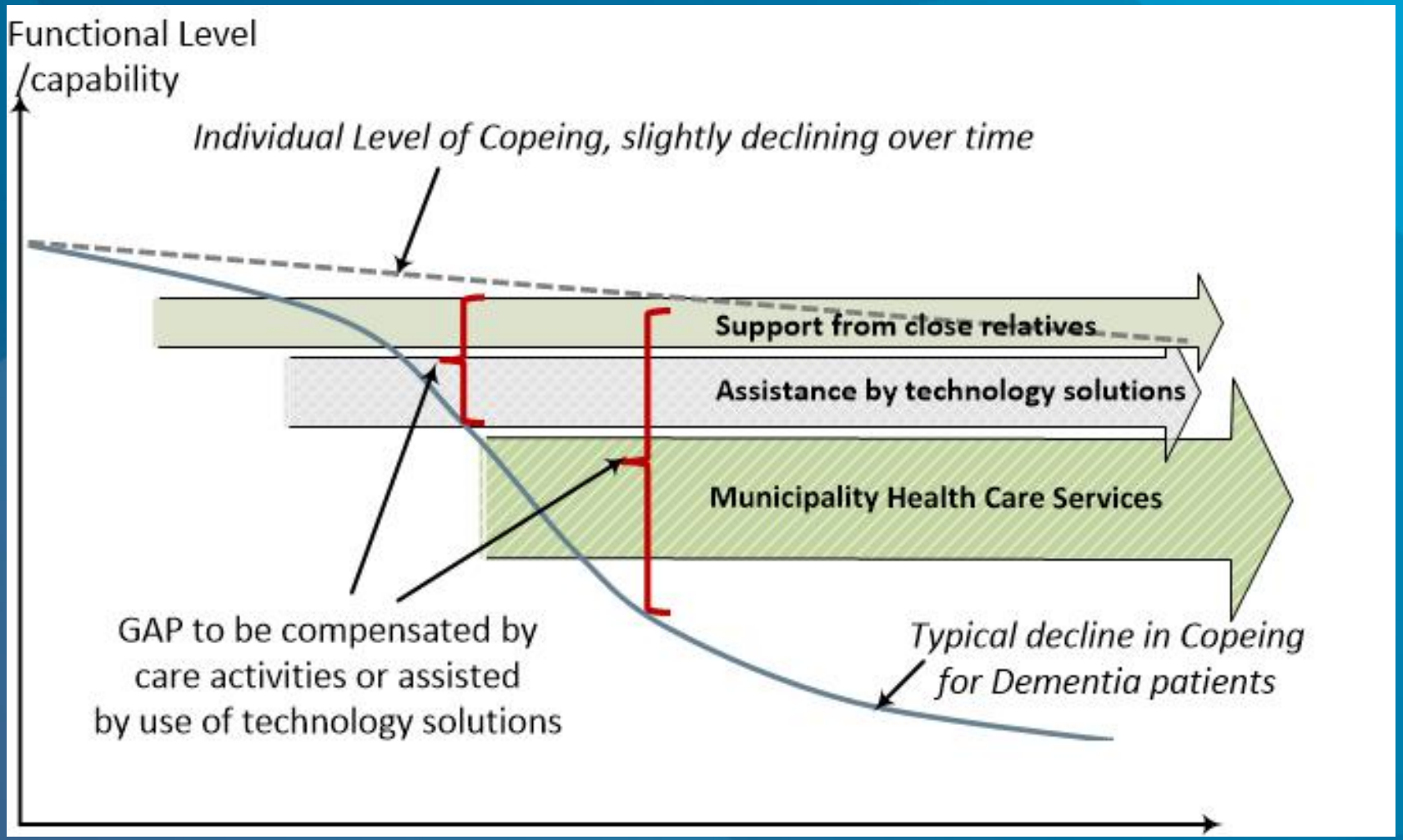
eHealth | UNIVERSITY OF AGDER | SØRLANDET SYKEHUS | Kristiansand

www.united4health.no
www.united4health.eu

Putting Patients at focus

- Holistic view and combined actions
- Integration of technology and services
  - Technology aids for disabled people
  - Social alarm services
  - New smart home technologies to be able to live longer at home
  - Telehealth services, point-of-care
  - Support from home health care services
  - Assistance from family members and voluntary services

Gradually decline in functions



Patient empowerment

- Access to health care records – Personal Health Record
- Electronic dialogue with health care services
- Personalized rehabilitation activities
  - Fitness and welfare activities
- Educational materials and disease information
- Virtual meeting places with other patients

Scaling up challenges

- Formalization of contracts between all partners involved
  - Contracts for medical accountability issues and procedures
  - Contracts for data responsibilities including EHR storage
  - Contracts for economic regulations
    - Operating costs for Telemedical central
    - Maintenance for ICT solutions
    - Updating ICT solutions with new functions and integrations
  - Routines for incorporating patients and personalized regimen
  - Routines for escalation of an acute patient situation (Triage)
  - Evaluation and research

Research Plans
MethoTelemed Guidance

- a systematic documentation of the type and extent of telemedicine applications
- a structured framework for assessing the effectiveness and contribution to quality of care

Preceding considerations

- Purpose of the telemedicine application?
- Relevant alternatives?
- International, national, regional or local level of assessment?
- Maturity of the application?

Multidisciplinary assessment

1. Health problem and characteristics of the application
2. Safety
3. Clinical effectiveness
4. Patient perspectives
5. Economic aspects
6. Organisational aspects
7. Socio-cultural, ethical and legal aspects

Plans for Future Deployments

United4Health

- Establish a unified health network in the region
  - For ad-hoc based shared access to medical information
  - Bring the expertise closer to the patient by telemedicine
- Expanding within the region to all municipalities
- Establishing 3 regional Telemedical centrals
- Expanding to other chronic diseases
- Incorporating Telecare services and social alarm systems
- Integration of the national “Core” health record
- Information integration with existing EHR systems
- Integrating patient’s access to the Norwegian Health Portal
- A challenging business case for health care services

General Project Challenges

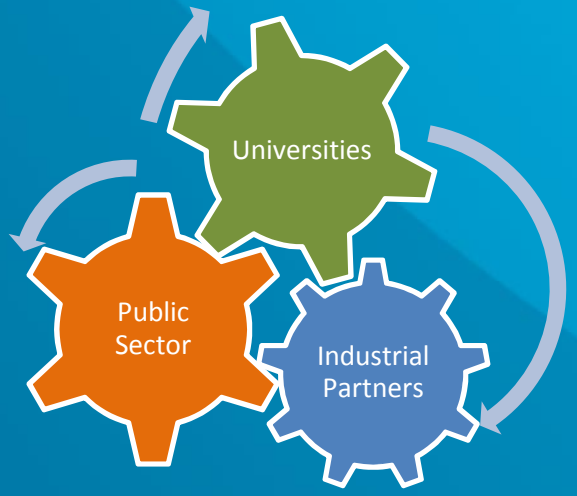
- Commitments from all stakeholders
- Involvement of the Local Doctors/General Practitioner
- Implementing technology at scheduled time
- Patients need more teaching in the technical use
- Telemedicine technologies are not of-the-shelf products
- During planning and start-up:
  - Organizational issues 50%, Technical issues 50%
- During implementation and deployment:
  - Organizational issues 40%, Technical issues 60%
- Expected in scaling-up
  - Organizational issues 60%, Technical issues 40%

Future follow-up suggestions

- Today, we store patients self reports in a centralized database
- We need integration with existing EHR systems
- We also need to collect a total health care resource overview
  - Important for evaluation of cost-benefits
  - Important for comparing different treatment interventions
- <u>Suggested action:</u>
- Future chronic care interoperability showcase for development, implementation, deployment and research on quality and outcomes, based on HL7 FHIR profiles for point-of-care services

EIP-AHA B3 Partner

The South Norway connected Health Initiatives



- The Triple Helix Concept
  - **University of Agder, Centre for eHealth**
    - source of new knowledge and technology, focusing on eHealth research
  - Sørlandet Hospital and 30 municipalities in Agder
    - source of contractual relations in a knowledge-based society
  - DIGIN, the ICT cluster in Southern Norway
    - the locus of production

eHealth · UNIVERSITY OF AGDER · SØRLANDET SYKEHUS · Kristiansand

www.united4health.no
www.united4health.eu