



Mobile Patient Monitoring

Applications and Experiences

*CE marked and certified against
the Medical Device Directive (MDD, Europe)*

Supported and funded by 2 EU projects

MobiHealth

IST-2001-36006



HealthService24

Continuous Mobile Services for Healthcare

eTEN-C517352



What is Ericsson Mobile Health (EMH)?

Mobile Monitoring

- Wireless, lightweight system easily fitted on patients.
- Sensors measure and transmit objective data and vital values.
- Guaranteed security, convenience and precision.

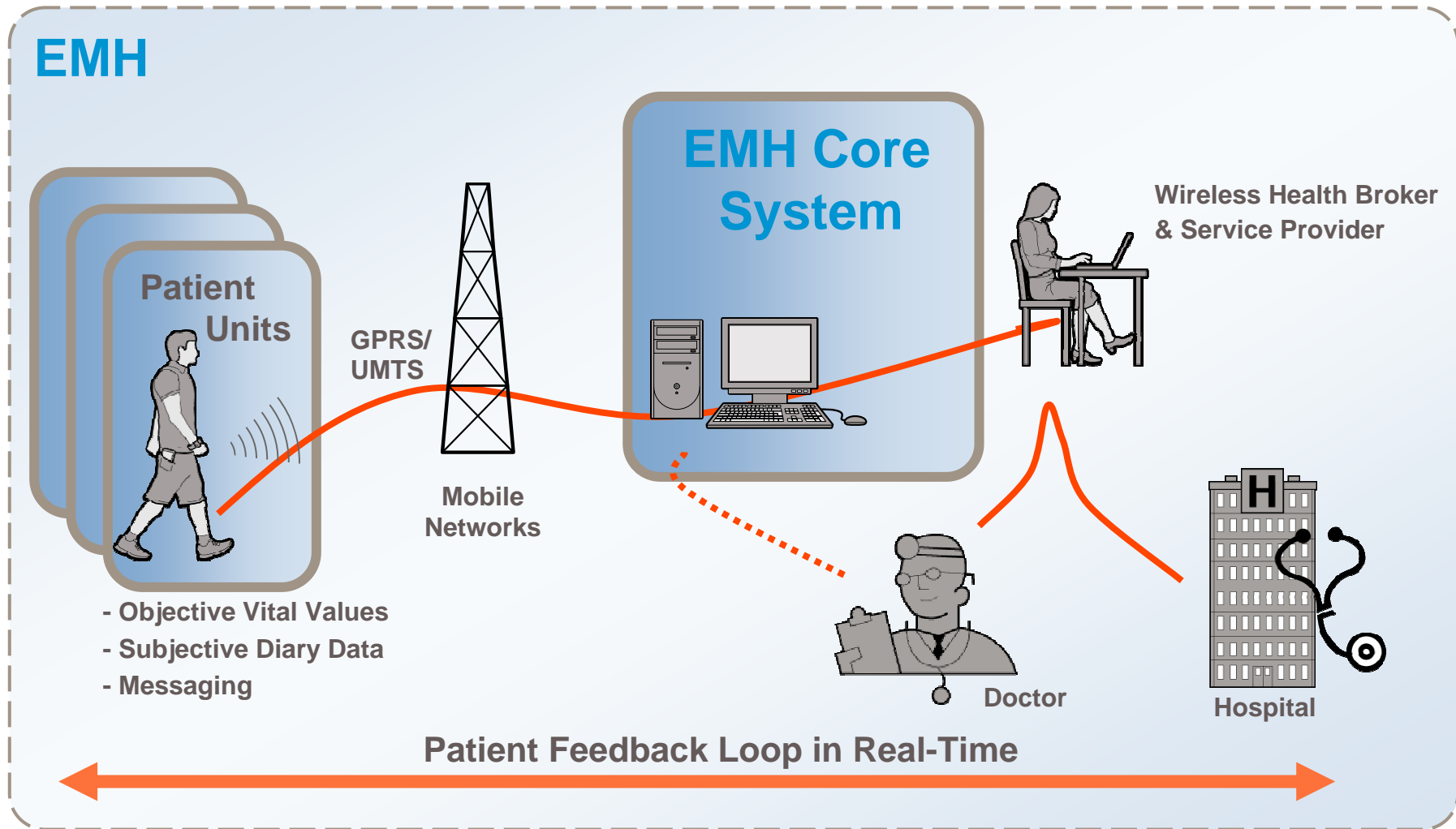
Patient Diary and Messenger

- Supports subjective information and communication.
- Direct patient contact maintained at all times.
- Provision of “clean”, valid data in real time.
- Enables flexible and individual patient-doctor messaging.



EMH functional overview

Monitoring of objective + subjective body values anytime, anywhere



EMH applications and body values

Disease area	Sensor	Examples
1. Heart	<ul style="list-style-type: none"> ▪ Pulse oximeter ▪ ECG 3 lead ▪ Body weight scales 	<ul style="list-style-type: none"> ▪ Remote diagnosis assessment ▪ Arrythmia ▪ Heart insufficiency / heart failure ▪ Post operative monitoring
2. Lifestyle	<ul style="list-style-type: none"> ▪ Pulse oximeter ▪ ECG 1 lead ▪ Body weight scales 	<ul style="list-style-type: none"> ▪ Physical excersise ▪ Wellbeing programmes ▪ Obesity ▪ Smoke cessation
3. Chronic diseases	<ul style="list-style-type: none"> ▪ Pulse oximeter & capnography ▪ Blood pressure monitor ▪ PEF meter ▪ Body weight scales 	<ul style="list-style-type: none"> ▪ COPD, Asthma, Emphysema ▪ Sleep apnoea ▪ Prolonged pain treatment, Post operative pain, Cancer pain ▪ Elderly care ▪ Prematurely born infarts ▪ Pediatric malformations (heart)
4. Stroke	<ul style="list-style-type: none"> ▪ Coagulation monitor 	<ul style="list-style-type: none"> ▪ Myocardial infarction ▪ Atrial fibrillation ▪ Transplant surgery patients ▪ Heart valve replacement patients
5. Diabetes	<ul style="list-style-type: none"> ▪ Glucometer ▪ Blood pressure monitor ▪ Body weight scales 	<ul style="list-style-type: none"> ▪ Diabetes patients ▪ Risk diabetes patients

(Areas in grey are currently under development)

Ericsson Healthcare Solutions - Microsoft Internet Explorer

File Edit View Favorites Tools Help

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Address http://192.165.126.86/logout.do Go Links

Google Sök webb 160 spärrad Alternativ

ERICSSON M-Health

Home Support About Ericsson Healthcare Solutions

→ Login

Login to the Ericsson Healthcare Solutions system

Login

Username

Password

Log in

Version: Core-3.7.9

Done Internet

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Address <http://192.165.126.86/web-module-0001/patientList.do> Go Links

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ERICSSON M-Health Search

Home Support About Ericsson Healthcare Solutions

→ Patient List

Patients listed here can be monitored by the Ericsson Healthcare Solution.

Patient List
[Create Patient](#)
[Unit List](#)

Patients in the M-Health System

Patient	Latest Reading	Latest Diary
John Doe	2005-09-19 06:24	2005-09-19 06:33
Patient no 3	2005-09-15 17:40	2005-09-15 14:38
patient2	2005-09-14 17:07	
testpatient	2005-09-14 16:52	2005-09-14 16:13

Currently viewing

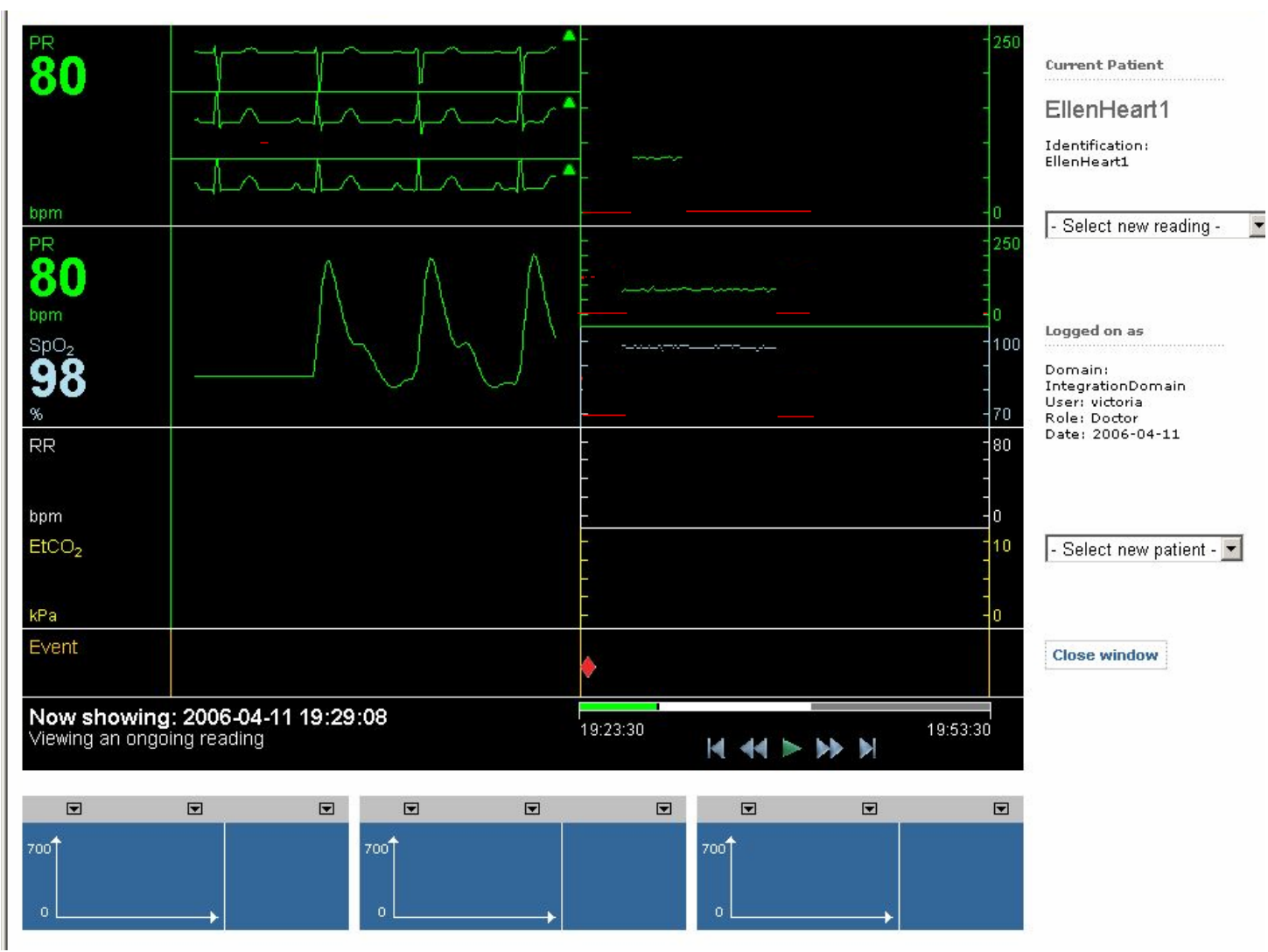
Domain: testDomain
 User: doctor
 Role: Doctor
 Date: 2005-09-19

General navigation

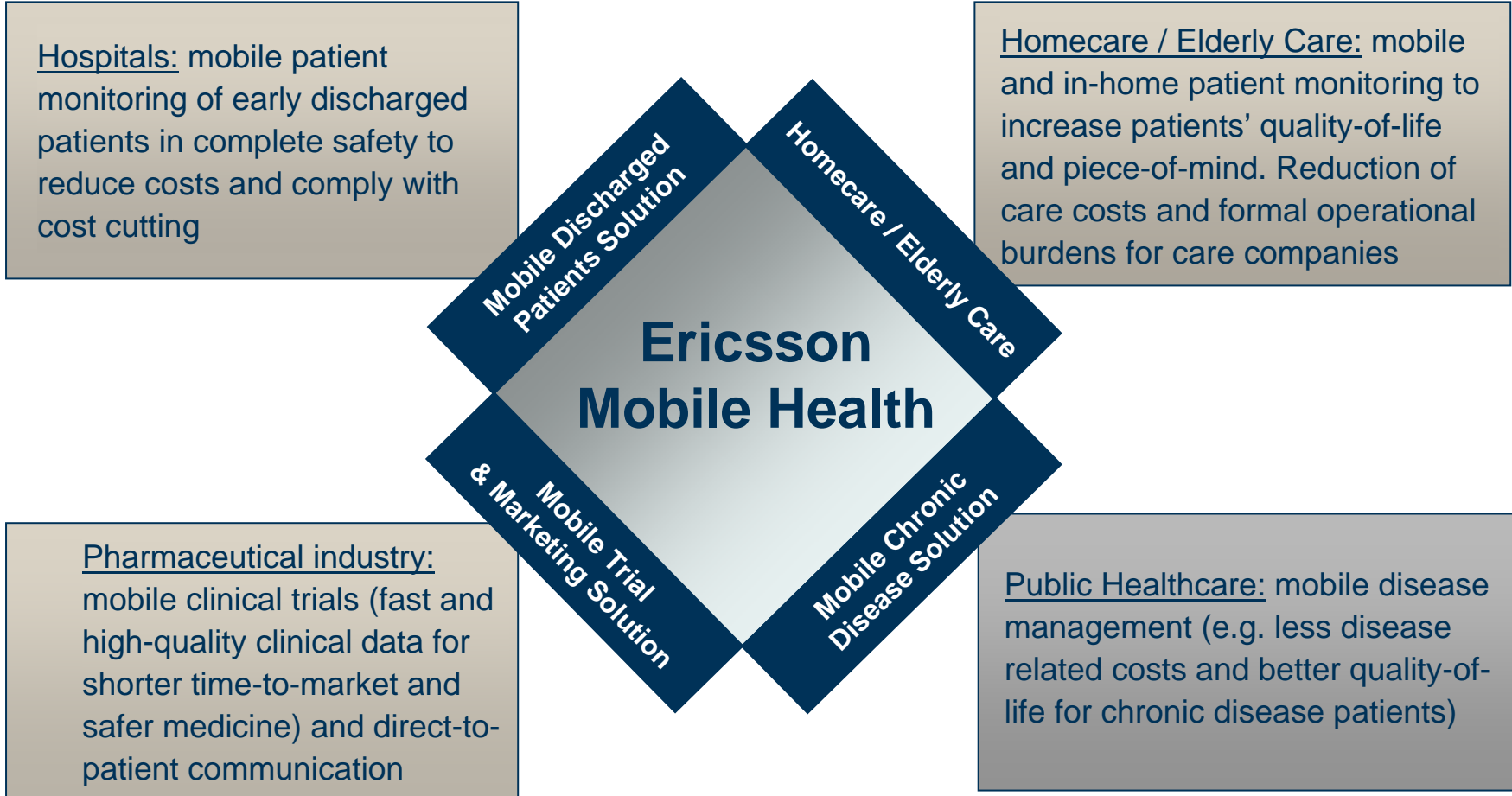
- Personal Profile
- Registered users
- Log out

All Patients
 My Patients

Version: Module0001-3.7.9



EMH target markets and value propositions

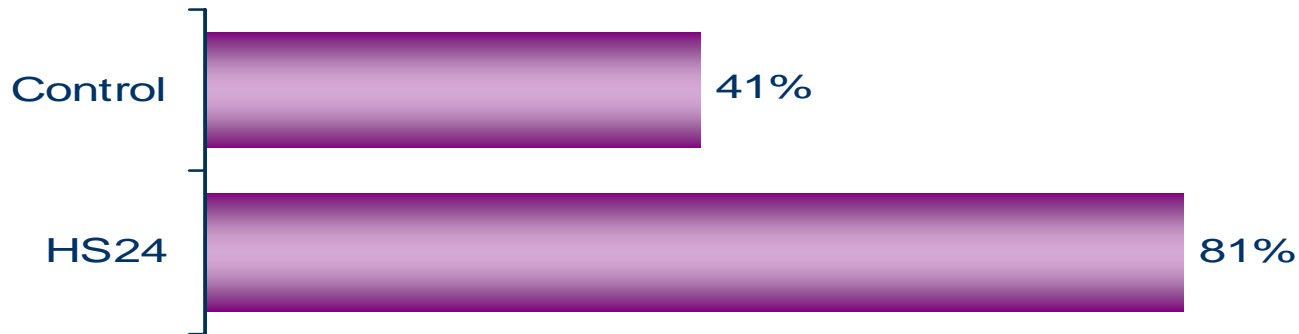


Reference cases for EMH (I)

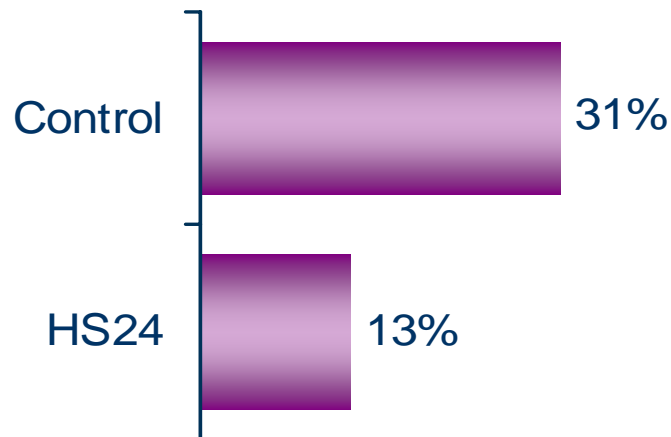
- “Mobihealth” EU health research project 2000-2004
 - Prototyping and technical validation
 - 4 European hospital validation sites: Spain, The Netherlands, Germany, Sweden
 - See www.mobihealth.org
- “Health Service 24”, EU healthcare initiative 2005-2007
 - 3 hospital implementation sites in Europe: Spain, The Netherlands, Cyprus
 - Target indications: COPD, High Risk Pregnancies, Heart Disease
 - Studies running between February and August 2006
 - See www.healthservice24.com

Clinical outcomes HS24

COPD: Self management skills (8 weeks)



COPD: Rate unexpected admissions (8 weeks)



Clinical outcomes HS24

- In the cardiac trials
 - 60% decrease in rate of admission was observed
 - 90% of the patients claimed to feel more reassured by being monitored through HS24

- In the pregnant women trial
 - Optimal clinical scenario, but results were not conclusive due to technical (interference) problems

Economic indicators HS24

- COPD
 - Only direct costs have been considered
 - The costs per patient under the integrated, mobile care model were 62% of the costs of the conventional model. This was mainly due to fewer days of in-patient hospitalisation (1.7 versus 4.2 days)
- Cardiac patients
 - A clear reduction in the number of admissions was observed. Cardiologists could assess patients from their home and detect if any anomaly existed in the signals.
 - Reduction in travel costs for the patients
 - Reduction in emergency room care since cases/problems were detected early and directly addressed to the ward/specialist

Reference cases for EMH (II)

- SMS Messenger for patient compliance
 - Adherence is a major challenge in psychiatry (significant relapse rates over one year)
 - Pilot trial with 30 patients ended February 2006
 - Validation trial with 80 patients started March 2006
 - Larger compliance project with >1000 patients are currently defined
 - Pilot trial result summary:
 - 71% of responses (to >10,000 messages) were within 'compliance' boundaries
 - The technology was well accepted and performed perfectly
 - 43% of Physicians used the system more frequently than required by the protocol - (50% were committed enough to use the system at home)

Reference cases for EMH (II)

- Pilot trial summary (cont):
 - When questioned by the investigator, over 80% of patients reported that as a consequence of the system they felt more cared for and that the system helped to remind them to take their medication
 - 50% of the physicians felt that the system enhanced patient compliance
 - Most of the Physicians felt that the system helped improved relationships between patients and Physicians
 - Most would recommend the system to patients

Other activities

- In-hospital mobile patient monitoring (cardiology patients) over Wireless Lan at 2 hospitals in Singapore; moving patients out of emergency wards
- Questionnaire-based solution for nurses in the US to conduct medical examinations for health/life insurances
- Proof of concept study with a large Indian hospital group (40 hospitals) in the areas of Asthma and Cardiology
- Pilot trials in Portugal (cardiology and COPD/Home Ventilation)
- Partnerships with (mobile) network operators in Sweden for large-scale national implementation
- Project with the leading Swedish hospital to propose a unified mobile communication strategy

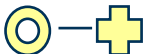
The benefits of mobile patient monitoring

Requirements for a value-added patient management system

- Tracking of personal data
- Convenient handling
 - Automatization
 - Ease of use
 - Mobility
 - Access to technology
- Personal care
- Feedback and interactivity

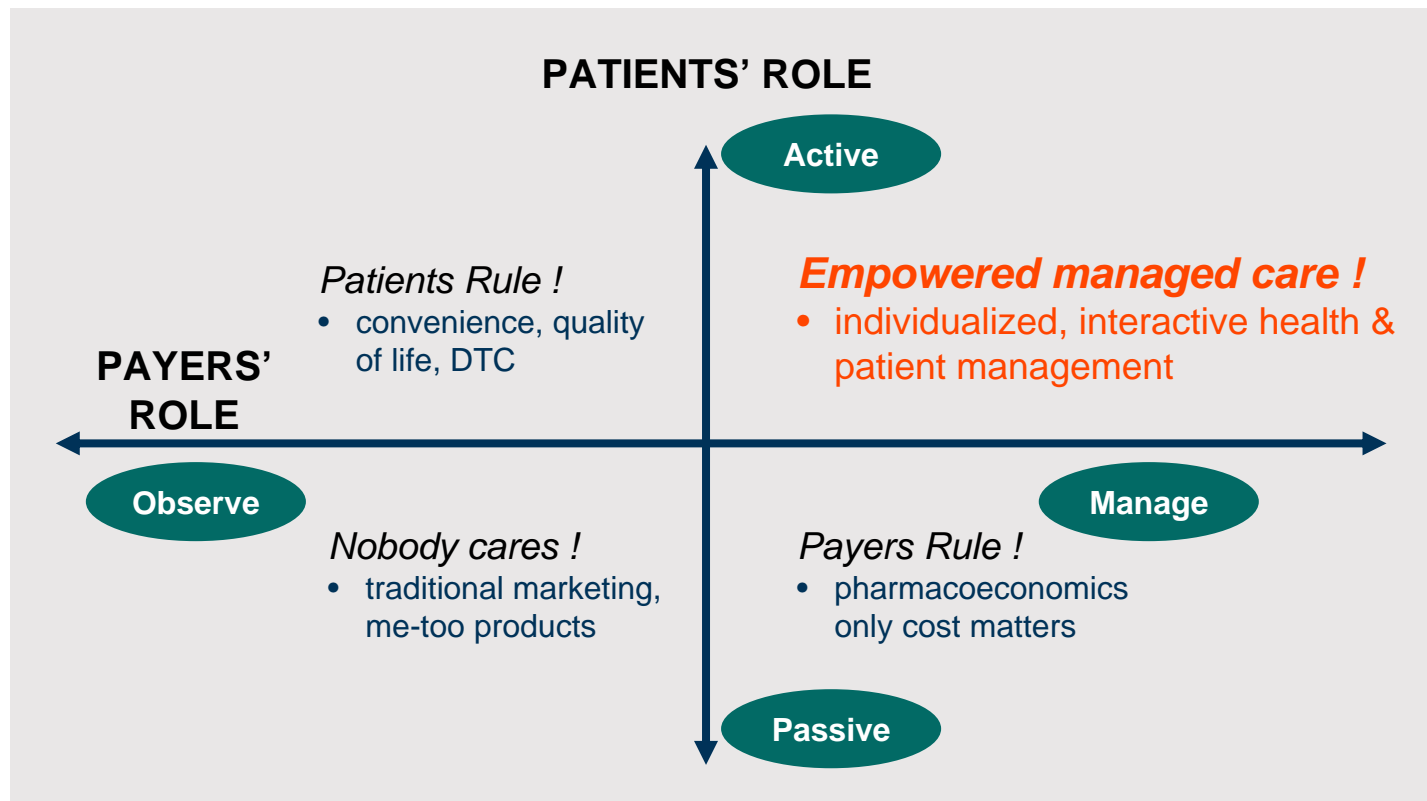
Existing Solutions

Mobile Health



New roles for patients & insurers

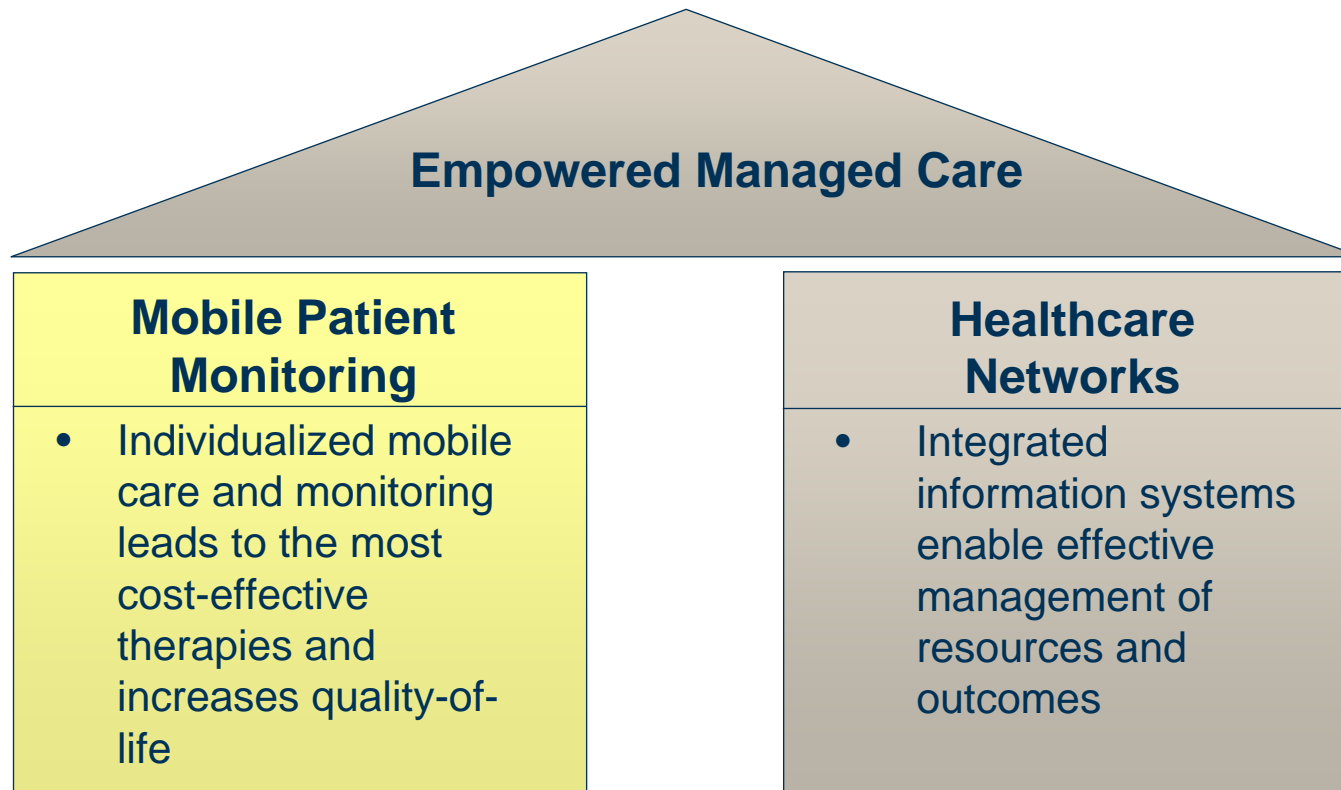
m-health solutions are suitable to contribute to solving the challenges of the healthcare sector



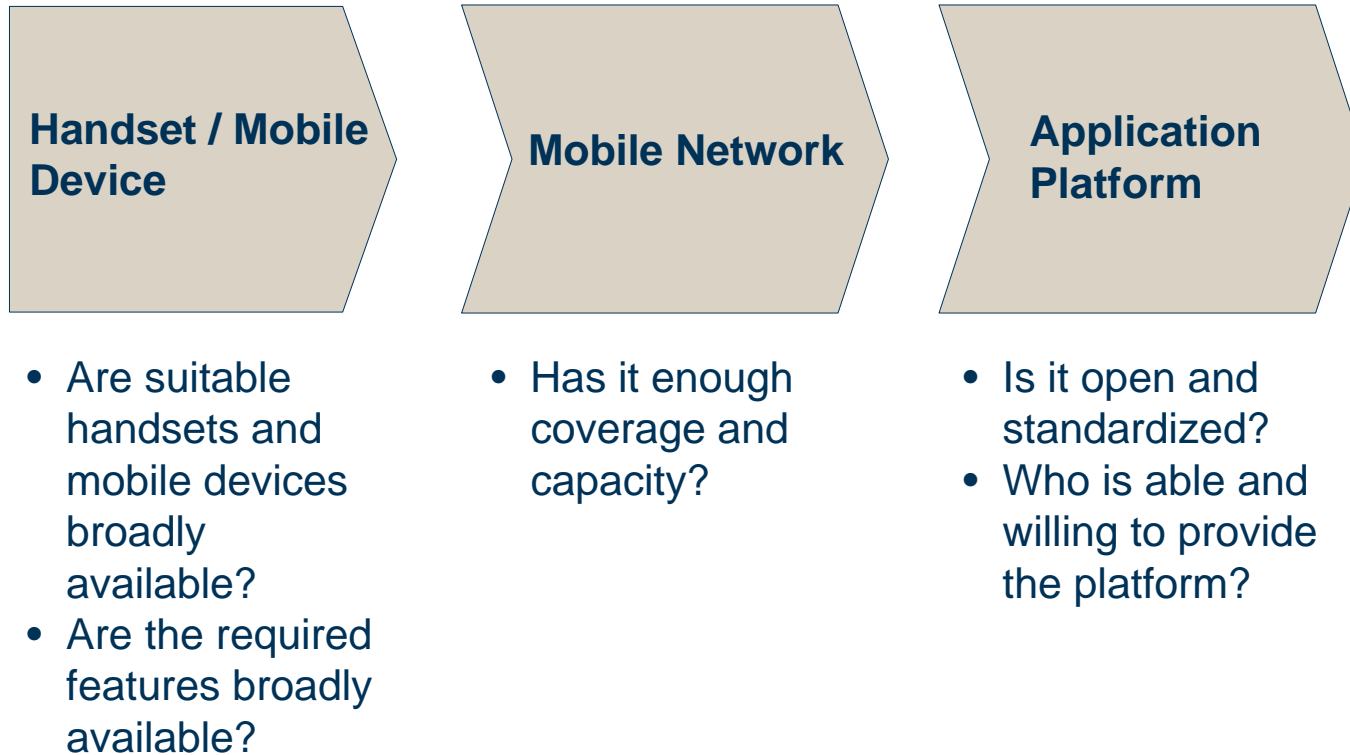
“Empowered Managed Care” is the new paradigm of healthcare

Empowered Managed Care – an integrated health solution approach

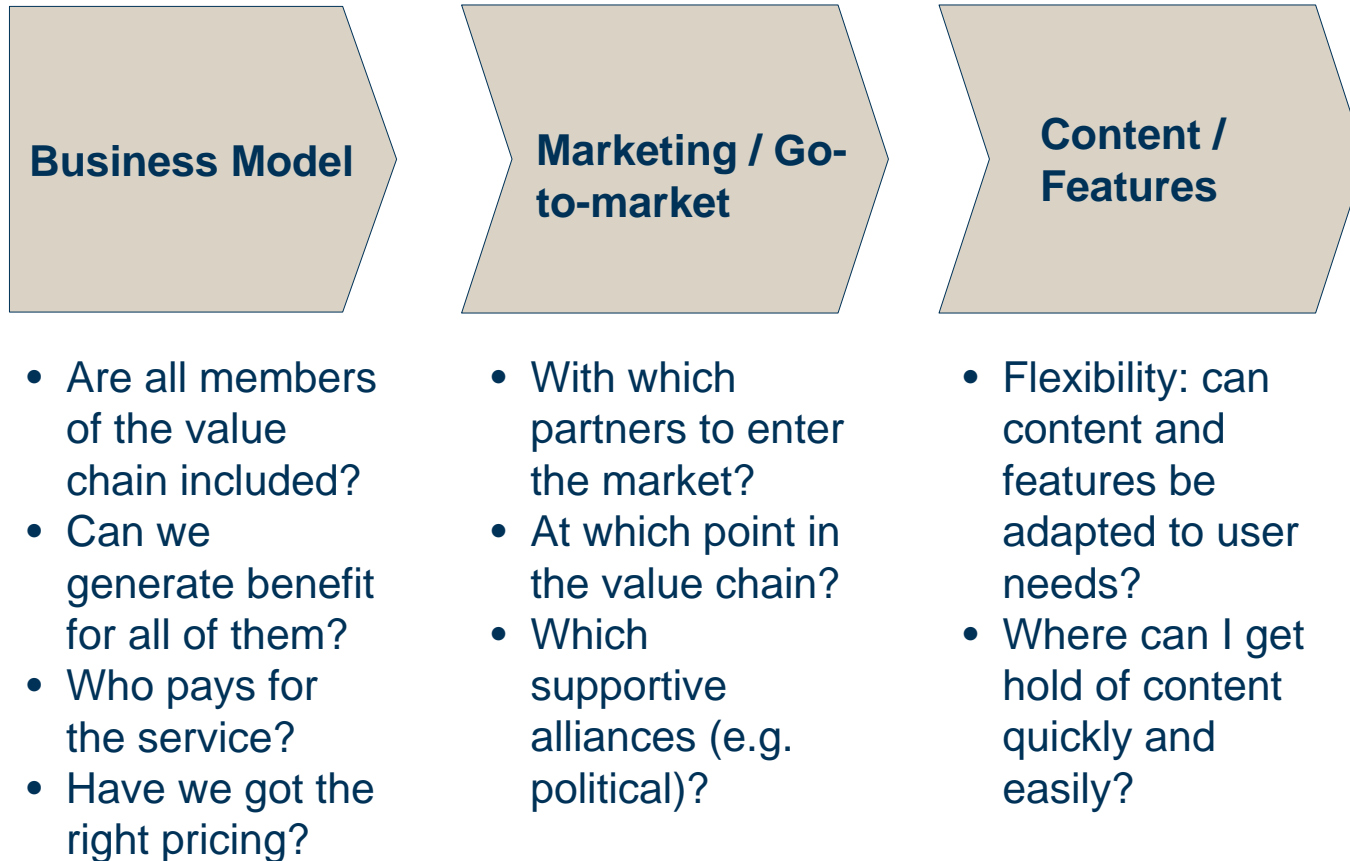
- **Packaged offer contains solutions for both pillars of empowered managed care**



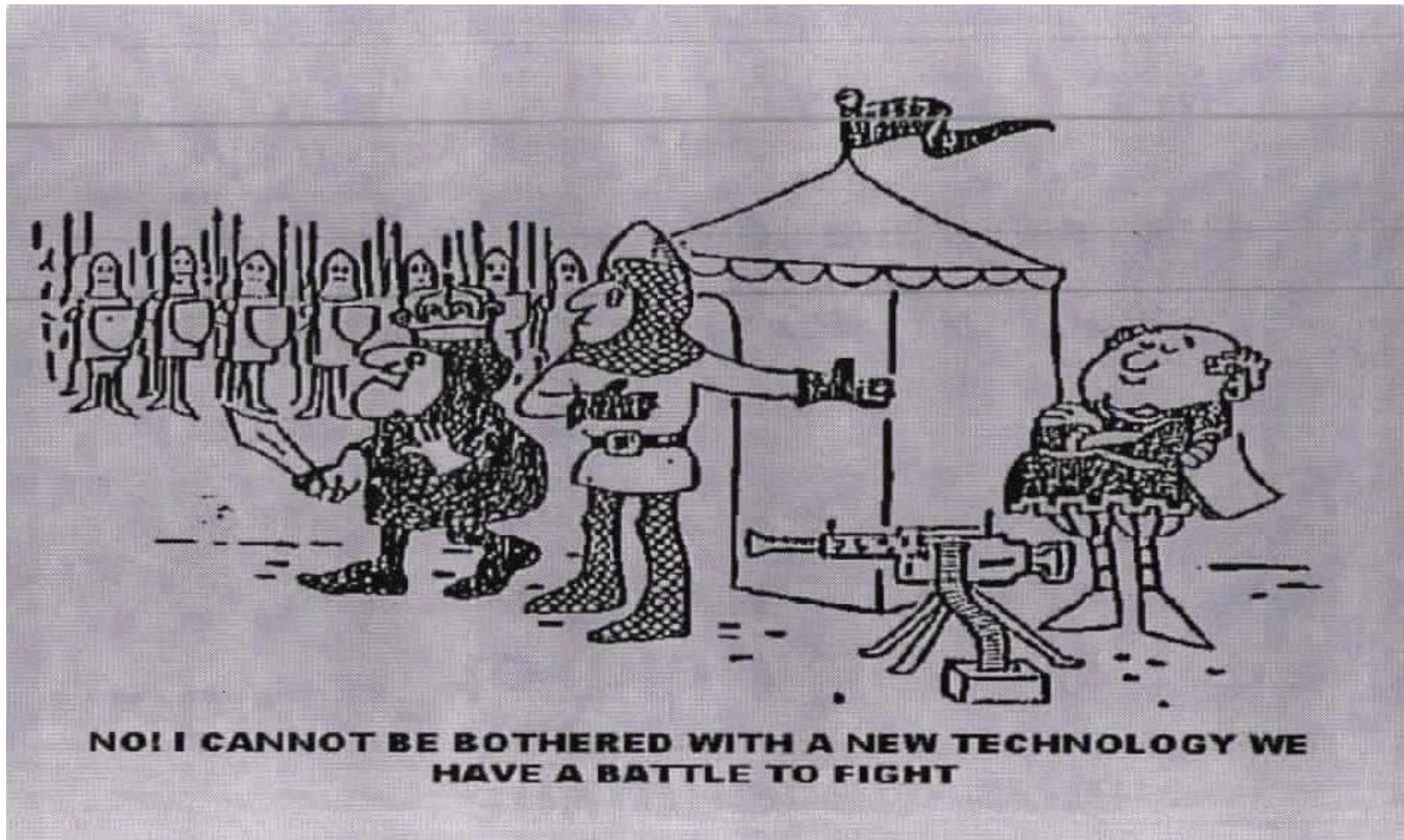
m-health success factors (I)



m-health success factors (II)



Technology is not enough!



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