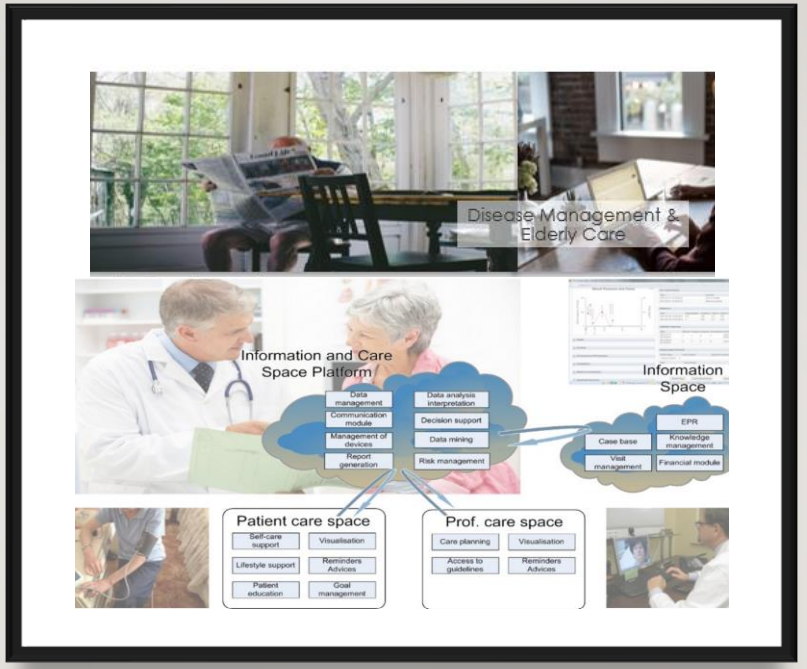
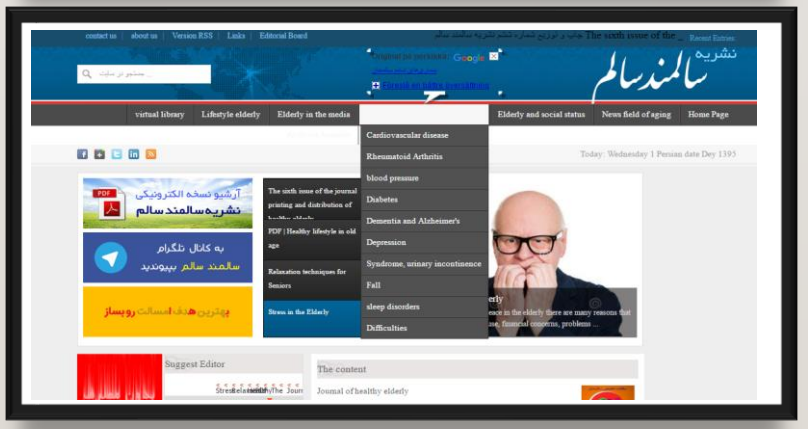




KAMELIA KHOSRAVIANI, MEDICAL INFORMATION SPECIALIST , E-HEALTH EXPERT

MEMBER OF SWEDISH ASSOCIATION FOR MEDICAL INFORMATICS
THE SENIOR INNOVATOR IN EUROPEAN RESEARCH PROJECTS MEMBER OF THE EUROPEAN RESPIRATORY SOCIETY

MEMBER OF PERSONAL CONNECTED HEALTH ALLIANCE

27 AUGUST 2023
STOCKHOLM

WHO:S DEFINITION ” HEALTHY AGEING”

"Healthy ageing is the process of developing and maintaining the functional ability that enables wellbeing in older age."

report on ageing and health, WHO, 2015

well-being includes the presence of positive emotions and moods (e.g., contentment, happiness), the absence of negative emotions (e.g., depression, anxiety), life satisfaction, development and activity , fulfillment and positive functioning.

THE REALITY LAB TESTS AND VALIDATES PRODUCTS, WORKING METHODS AND SERVICES THAT CAN CONTRIBUTE TO DEVELOPING THE ELDERLY CARE OF THE FUTURE. A UNIQUE ARENA FOR CO-CREATION BETWEEN THE ELDERLY, RELATIVES, STAFF, INNOVATORS, STUDENTS AND RESEARCHERS.

POSITIVE PROJECT AIM OF SPREADING KNOWLEDGE ABOUT HEALTHY AGING BY WATCHING ALL THE VIDEOS.

Sammanfattningsvis…

- Fysisk aktivitet
- Kost
- Meningsfulla aktiviteter
- Socialt engagemang
- Korrekt medicinering
- Teknologi

FYSISK AKTIVITET PÅ RECEPT-FAR

DAGBOK fysisk aktivitet

FaR Stockholms län

1177 VÅRDGUIDEN | Region Stockholm

Fysisk aktivitet på recept – FaR

Du kan få ett FaR som en del av din behandling. Vad du ska göra, hur mycket och hur ofta, kommer du och den som skriver ut receptet överens om. Här kan du få tips om olika aktiviteter: **www.FaRledare.se**

Hälsosam fysisk aktivitet

Öka	Byt		Minska
Vardagsaktiviteten	Rulltrappa Hiss	▶ Trappa	Bilåkande
Konditionen			TV-tittande
Muskelstyrkan	Bil	▶ Allmänna kommunikationer Cykel Gå	Skärmtid
Balansen			Tid i stillasittande – sitt helst inte mer än 30 minuter i sträck
	Sittande	▶ Regelbundna bensträckare Muskelaktivitet	

KÄLLA: REGION STOCKHOLM

Rekommendationer för dig som är vuxen (från 18 år)

- pulshöjande aktivitet på måttlig intensitet, t.ex. rask promenad minst 30 minuter 5 dagar per vecka
  ELLER
  pulshöjande aktivitet på hög intensitet, t.ex. löpning: minst 20–30 minuter 3 dagar per vecka
  OCH
- muskelstärkande aktivitet: 8–10 styrkeövningar med 8–12 repetitioner 2 dagar per vecka
  OCH
- träna balans om du är över 65 år
  OCH
- undvik långvarigt stillasittande

Du kan kombinera pulshöjande aktivitet på måttlig intensitet (din andning ökar och du blir lite varm) och hög intensitet (din andning ökar ordentligt och du blir svettig) under veckan. Aktiviteterna kan delas upp i kortare pass än 30 minuter, som till exempel 10-minuterspass. Om du har stillasittande arbete eller sitter mycket på fritiden är det bra med regelbundna korta pauser "ben-sträckare" med någon form av muskelaktivitet under några minuter.

All rörelse (fysisk aktivitet) bidrar till bättre hälsa och mer rörelse ger större effekt!

Mina mål

Sätt gärna mål och planera dina aktiviteter så ökar chansen att lyckas. Dina mål ska kännas realistiska och möjliga att genomföra. Lycka till!

Mitt övergripande mål är _____

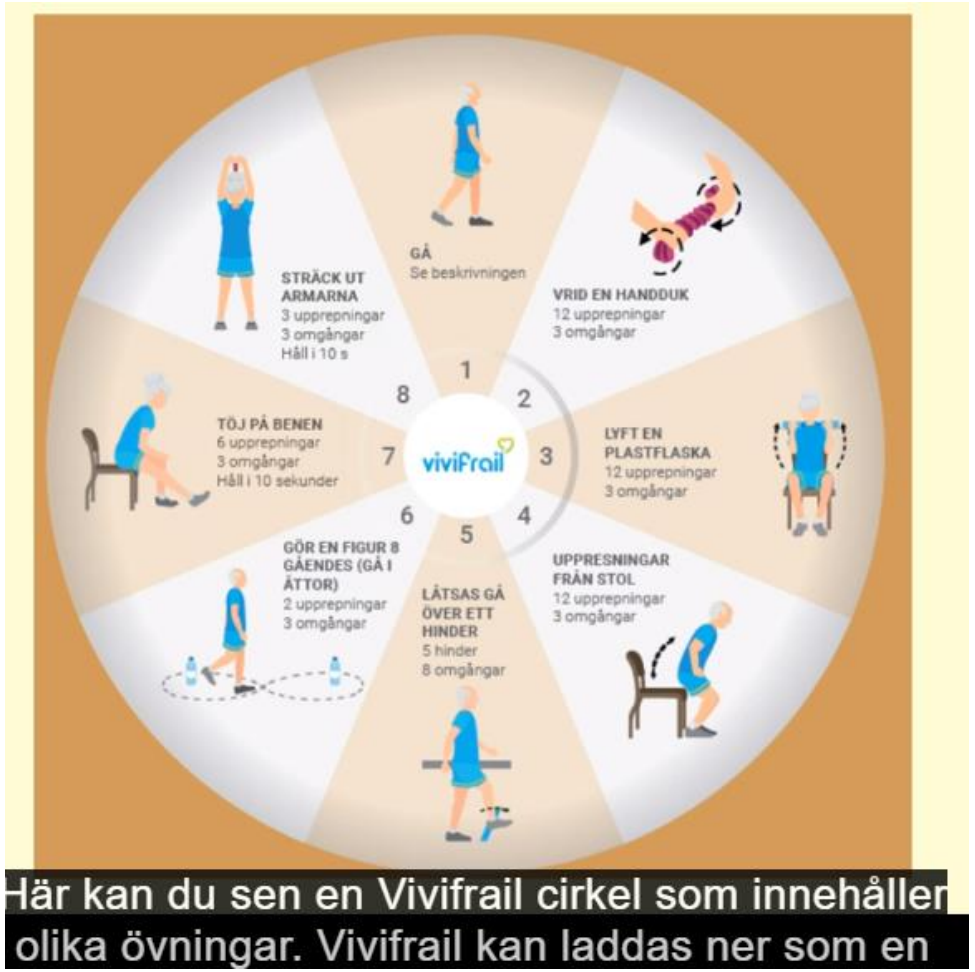
_____

_____

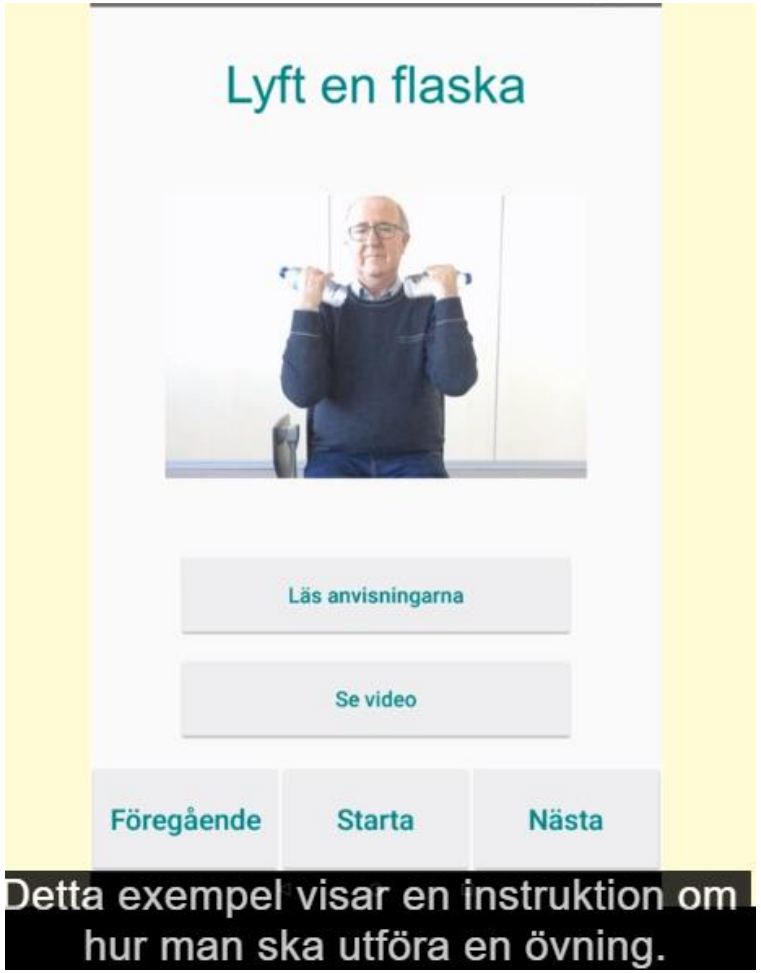
_____

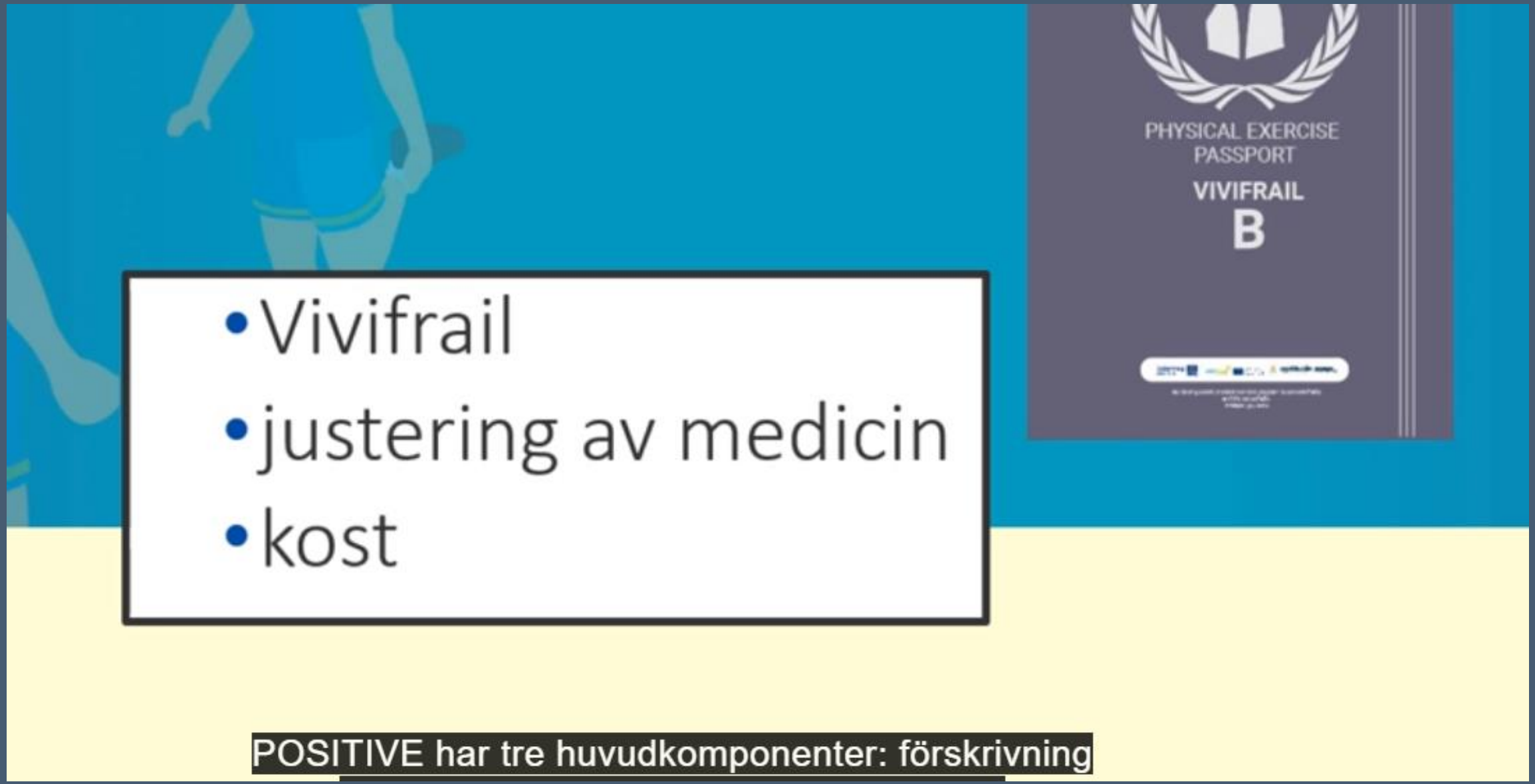
Mina mål de närmaste 4 veckorna är

1. _____
2. _____
3. _____
4. _____

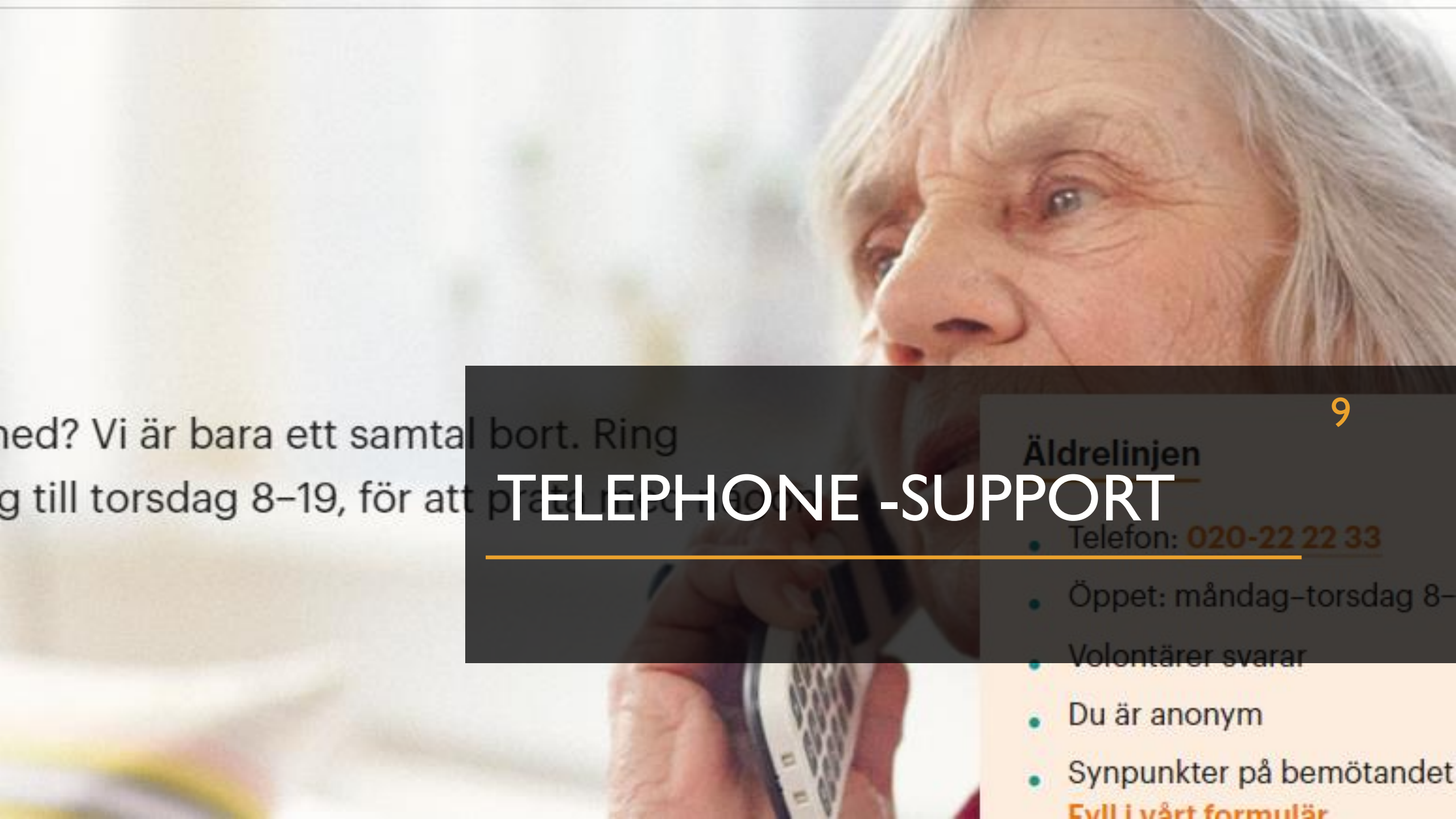


Här kan du sen en Vivifrail cirkel som innehåller olika övningar. Vivifrail kan laddas ner som en


Lyft en flaska
Läs anvisningarna
Se video
Föregående
Starta
Nästa
Detta exempel visar en instruktion om hur man ska utföra en övning.


PHYSICAL EXERCISE
PASSPORT
VIVIFRAIL
B
• Vivifrail
• justering av medicin
• kost
POSITIVE har tre huvudkomponenter: förskrivning

TELEPHONE -SUPPORT



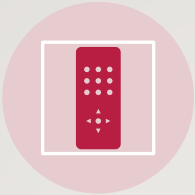
Hygienassistenten Poseidon. En svensk innovation för mänskligare vård.

Poseidon är världens första hygienassistent. Egentligen är det en intelligent duschlösning, som på ett unikt sätt hjälper äldre och rörelsehindrade personer att själva ta hand om sin personliga hygien.

LÄS MER

INTERNET OF MEDICAL THINGS /HEALTHCARE IOT

IoMT is collection of medical devices/sensors & API that connect to healthcare IT system by WiFi, M2M , Cloud



Remote patient monitoring for Chronic /long term condition

Tracking medication order & locations of patients admitted to hospital

Wearable mhealth devices to send info to caregivers

Analytics dashboard on vital signs

Communication of API & devices through NFC, RFID , BLE ..

Telemedicine as distance treatment

Security/protected health information regulated (e.g under the Health insurance portability and accountability act HIPAA (USA) or GDPR-EU compliance)

E HEALTH :ROBOTIC +AI+ TELEMEDICINE

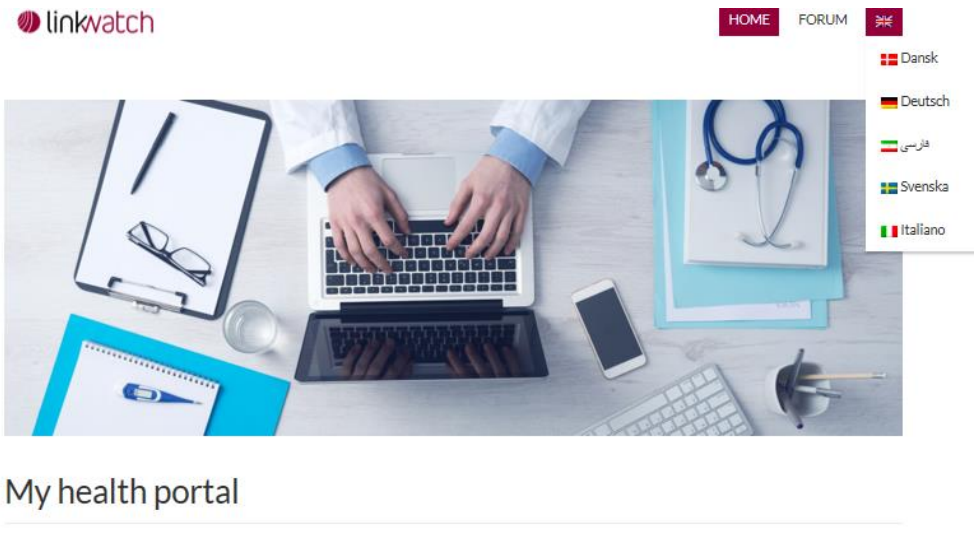
- AI-based ecosystem for supporting elderly people at home
  - IoT sensors / IoMT sensors
    - Movement sensors, Fall detection
    - Ambient temperature, humidity, air quality
  - Vital health signs measurement
  - Intelligent DSS & rule-based reasoning
  - Service robotics & telemedicine to support self-monitoring

TELECARE DEVICES SUPPORTED

Tobacco Smoke			Floor Sensor		
Window Sensor			Home Control		
Smart Plug Sensor			Liquid Intake		
Movement Sensor					
Wet Sensor					
Bed/Chair Sensor					

TELEHEALTH DEVICES SUPPORTED

Blood Pressure			Peak Flow Meter		
Personal Weight			ECG		
Medical Weight			Pedometer		
Blood Glucose			Activity and Sleep		
Blood Glucose			Heart Rate		
Blood oxygen			Rehabili-tation		


linkwatch
HOME
FORUM
Dansk
Deutsch
فارسی
Svenska
Italiano
My health portal
Login
User Name
Password
Login
Forgot your password?
This is the LinkWatch-portal. All measurements are carried out at home and are daily exchanged through a Smartphone app or a PC and are stored in LinkWatch. The data can be viewed as charts and tables. Thanks to its openness LinkWatch can easily be integrated into existing portals and health systems which require patients and care staff to share health data.

linkwatch
خانه
سنجش سلامتی من
شبکه مجازی
پروفایل خصوصی من
خارج شوید
اندازهگیریهای سلامتی من
فشارسیستولی 113 mmHg ۱۳۹۶/۱۱/۰۳ ۰۷:۳۸
فشاردیاستولی 80 mmHg ۱۳۹۶/۱۱/۰۳ ۰۷:۳۸
ضربان قلب 61 bpm ۱۳۹۶/۱۱/۰۳ ۰۷:۳۸
وزن 82.4 kg ۱۳۹۶/۱۱/۰۳ ۰۷:۳۱
قند خون 4.2 mmol/l ۱۳۹۸/۰۱/۰۵ ۱۱:۳۸
پیک بازدمی 7.3 liters/sec ۱۳۹۸/۰۲/۲۵ ۰۷:۲۷
بازدم اجباری 3.4 liters ۱۳۹۸/۰۲/۲۵ ۰۷:۲۷
اکسیژن اشباع خون 98 % ۱۳۹۷/۰۷/۱۹ ۰۵:۱۷
پالس اکسیمتری 72 bpm ۱۳۹۷/۰۷/۱۹ ۰۵:۱۷
minutes 579 ۱۳۹۷/۰۸/۱۲ ۰۶:۵۸

Mahidol University
MOBILE STROKE UNIT
1669
FC9J

From: Emily

- The increase in Sensor Pitch will increase the Air Touch control distance. Demonstrations have been done with pretty The increase in Sensor Pitch will increase the Air Touch control distance. Demonstrations have been done with pretty accurate operation up to 10cm away from sensor, but for public and industrial implementations about 5cm accurate operation is more realistic.ccurate operation up to 10cm away from sensor, but for public and industrial implementations about 5cm accurate operation is more realistic.

EYE TRACKING /TOBII

20 VIRTUAL REALITY

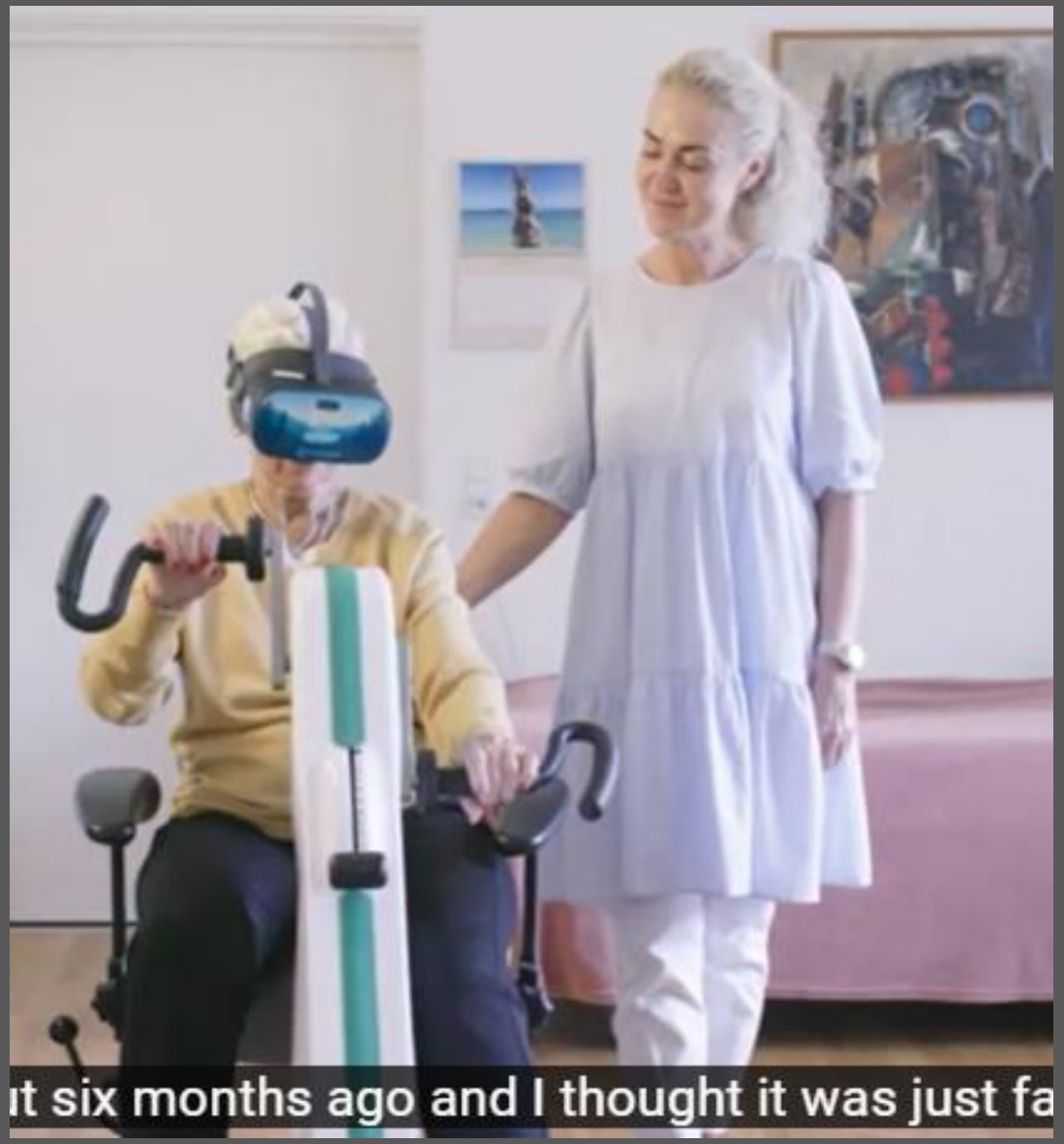
Treat Alzheimer's

Chronic Pain / pain therapy

Dementia Care

Senior community explores the world with virtual reality

Couple Back To The Places They Visited a Long Time Ago!


ıt six months ago and I thought it was just fa

VR solution for physical and cognitive exerci...
I think it is so impressive!

HOME MONITORING SENSORS

Energy sensor

Pressure sensor

Pressure sensor

Incontinent-sensor

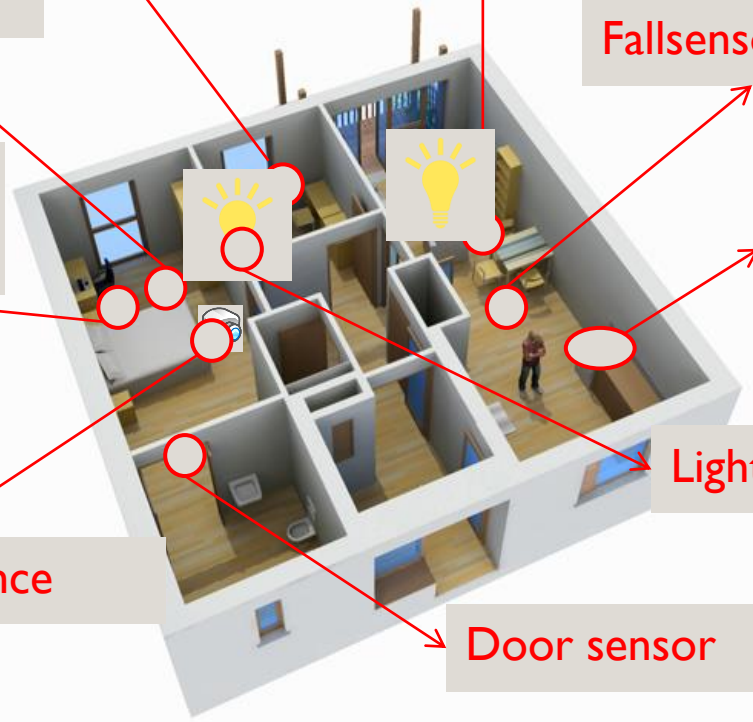
Fallsensor

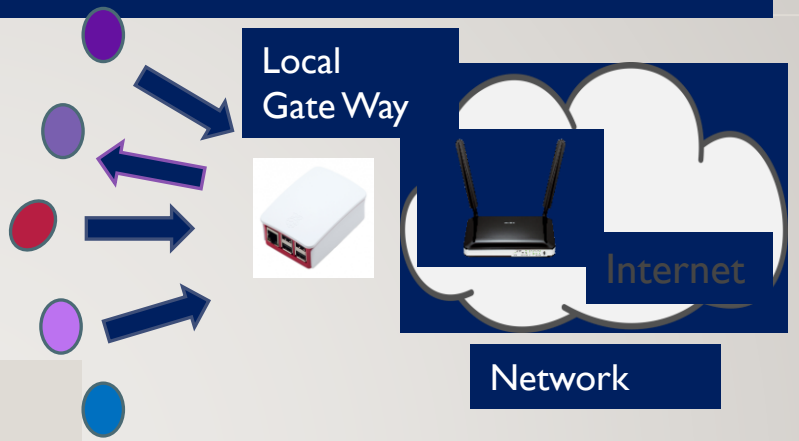
Motion sensor

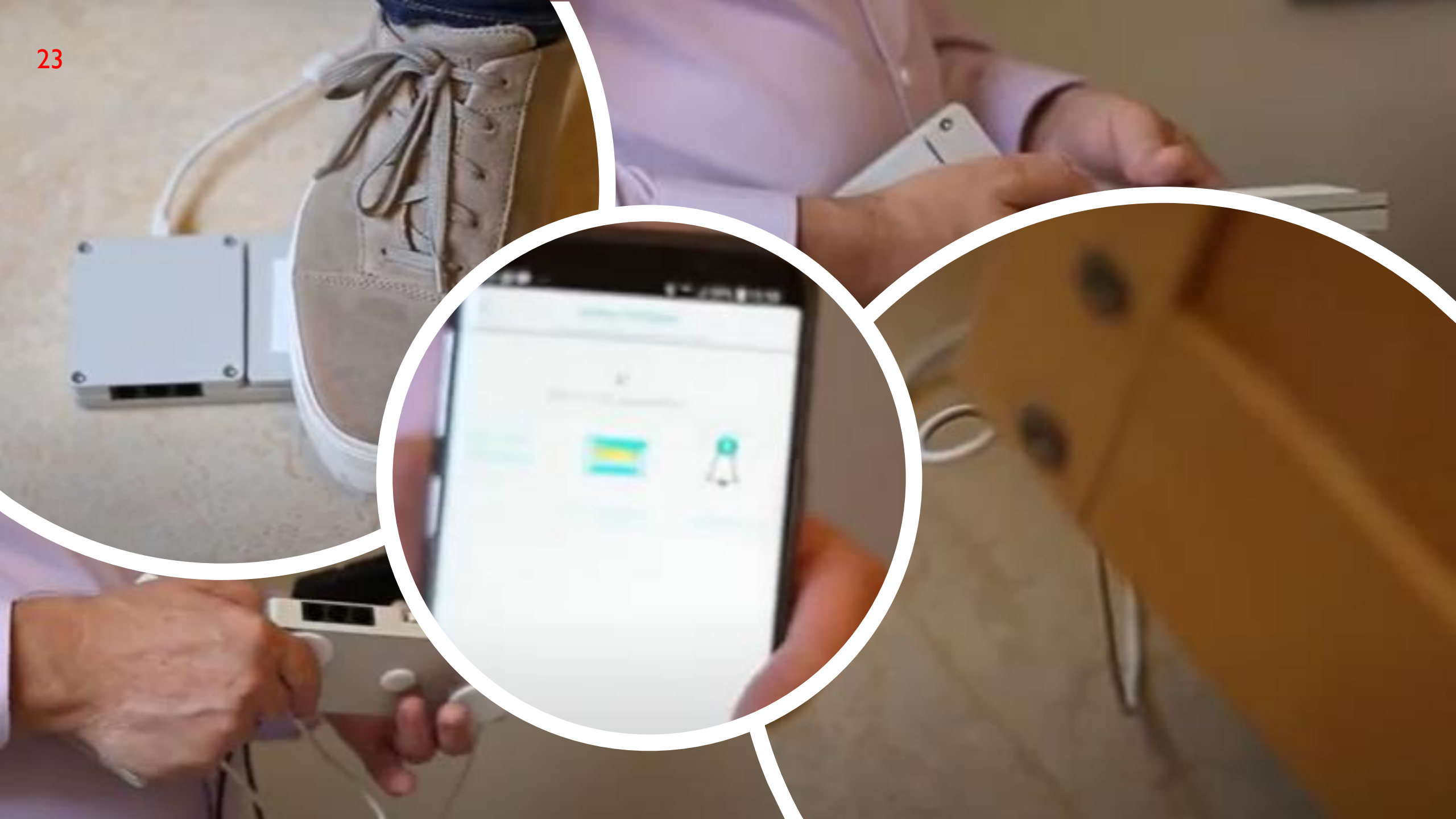
Light & sound feedback

Video Conference

Door sensor





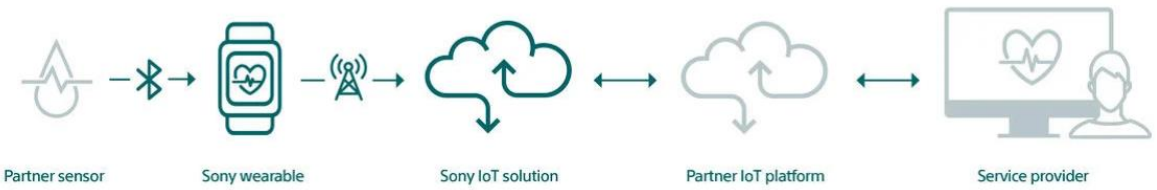


ARTIFICIELL INTELLIGENS EKOSYSTEM

- Fall prevention
- preventing pressure ulcers
- Contact with port service & care
- Sleep tracking
- Robotics services
- Alarm management

FALL DETECTION SENSOR

SafeTrx Care Fall Detection



and outdoors on the cellular network

even if the person loses consciousness or cannot move

taff crucial information about how the person was lying after a fall, an

cancel false alerts before they are sent

e confidence to keep active by reducing the fear of falling

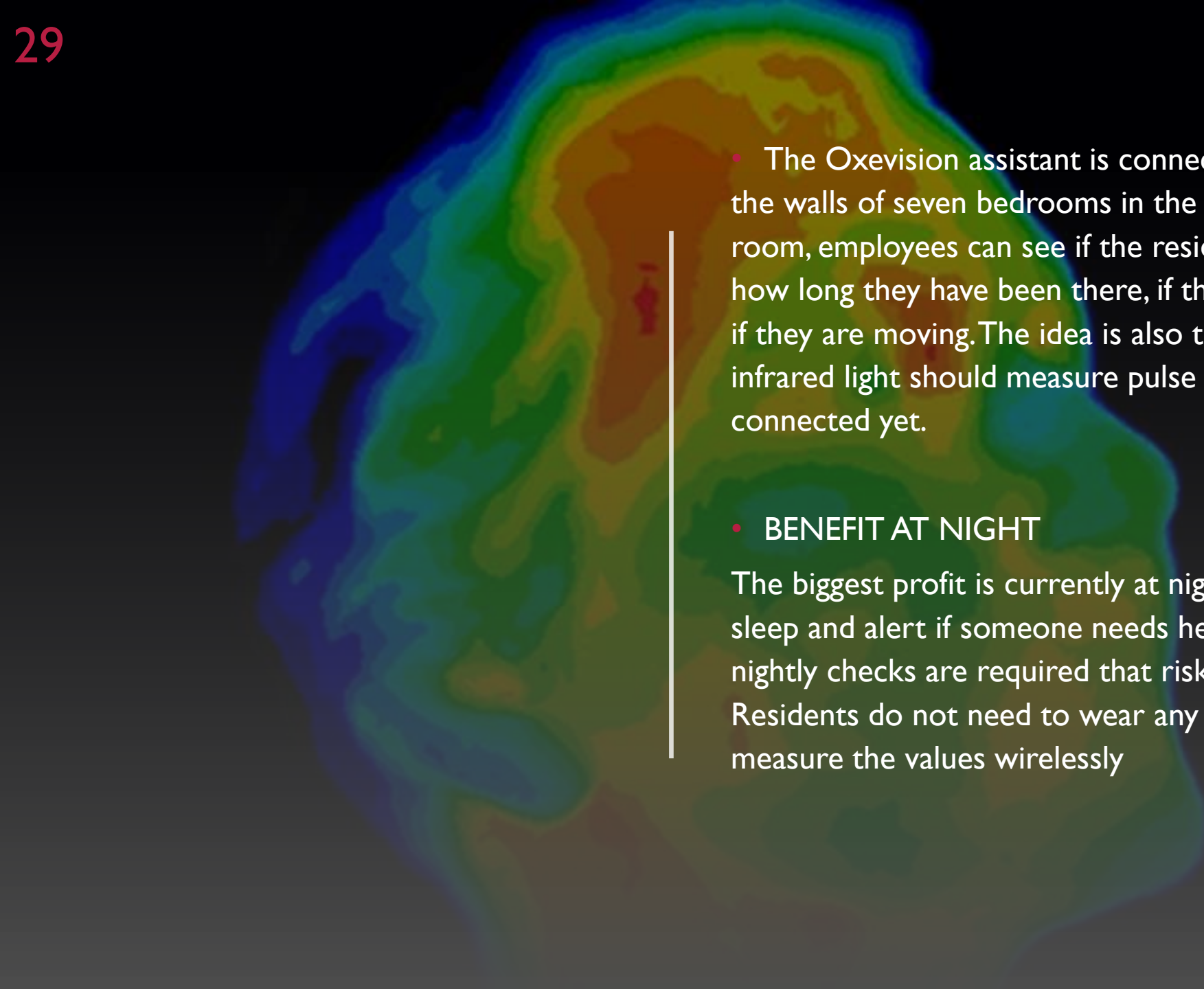
FEATURES

- The SafeTrx Care app on the mSafety wearable is remotely configurable to adapt to each case
- iOS and Android versions of the SafeTrx Care app also available
- Discreet activity detection, step counting, sleep, energy expenditure, heart rate, heart rate variability (rMSSD) and location tracking options
- Integration with wearable BLE accessories such as SpO2, blood pressure and fall prevention sensors
- SafeTrx Smart Home connects to major IoT platforms such as Samsung SmartThings and Alexa
- Integrated automatic fall detection and alerting

  Learn more about SafeTrx fall detection, in conjunction with industry leaders, Infonomy
- SafeTrx C2 rules-based dashboards, alerts and two-way messaging
- Secure end to end communication
- Cloud based and on-prem deployment options

28 GPS-ALARM (CE MARK)

- **When They Wander, You'll Never Wonder**

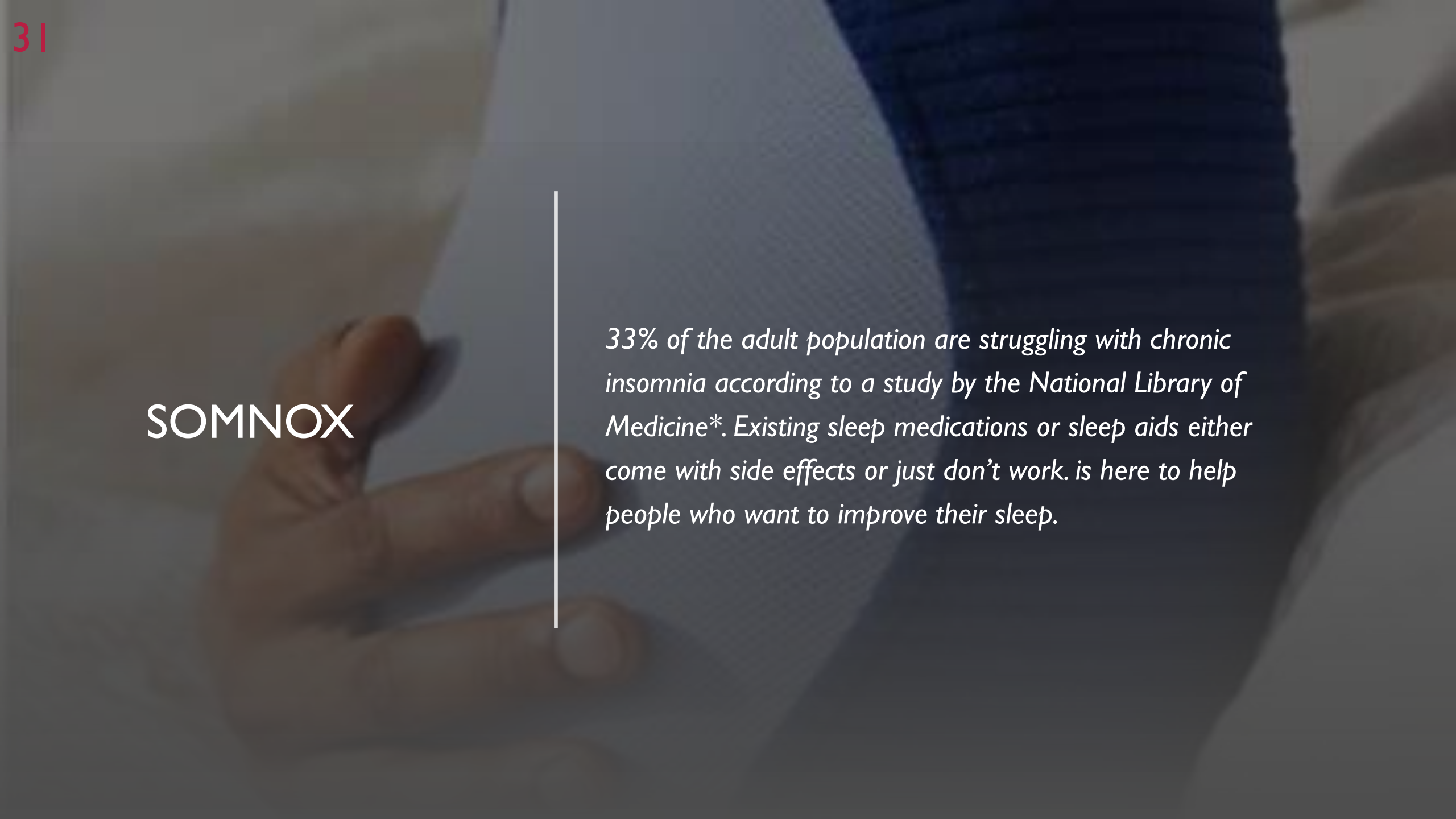


- The Oxevision assistant is connected to sensors installed on the walls of seven bedrooms in the residence. From the staff room, employees can see if the residents are in their rooms, how long they have been there, if they are asleep or awake and if they are moving. The idea is also that the sensors with infrared light should measure pulse and breathing, but it is not connected yet.

- BENEFIT AT NIGHT

The biggest profit is currently at night. As the sensors register sleep and alert if someone needs help or falls out of bed, no nightly checks are required that risk waking the residents. Residents do not need to wear any equipment, as sensors measure the values wirelessly

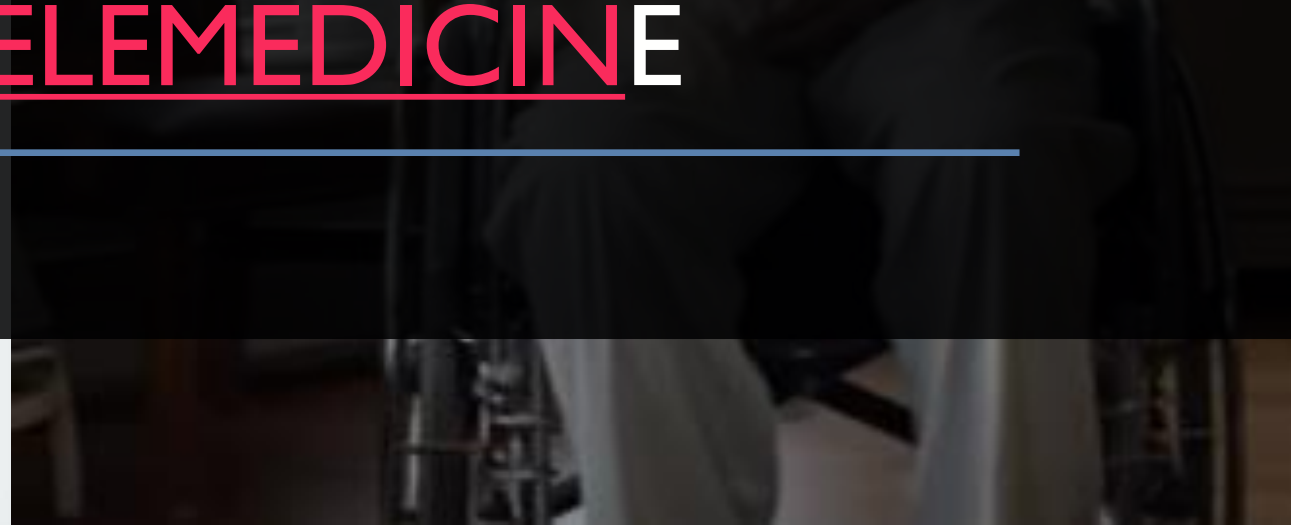
PU SENSOR -PRESSURE ULCER PREDICTION /



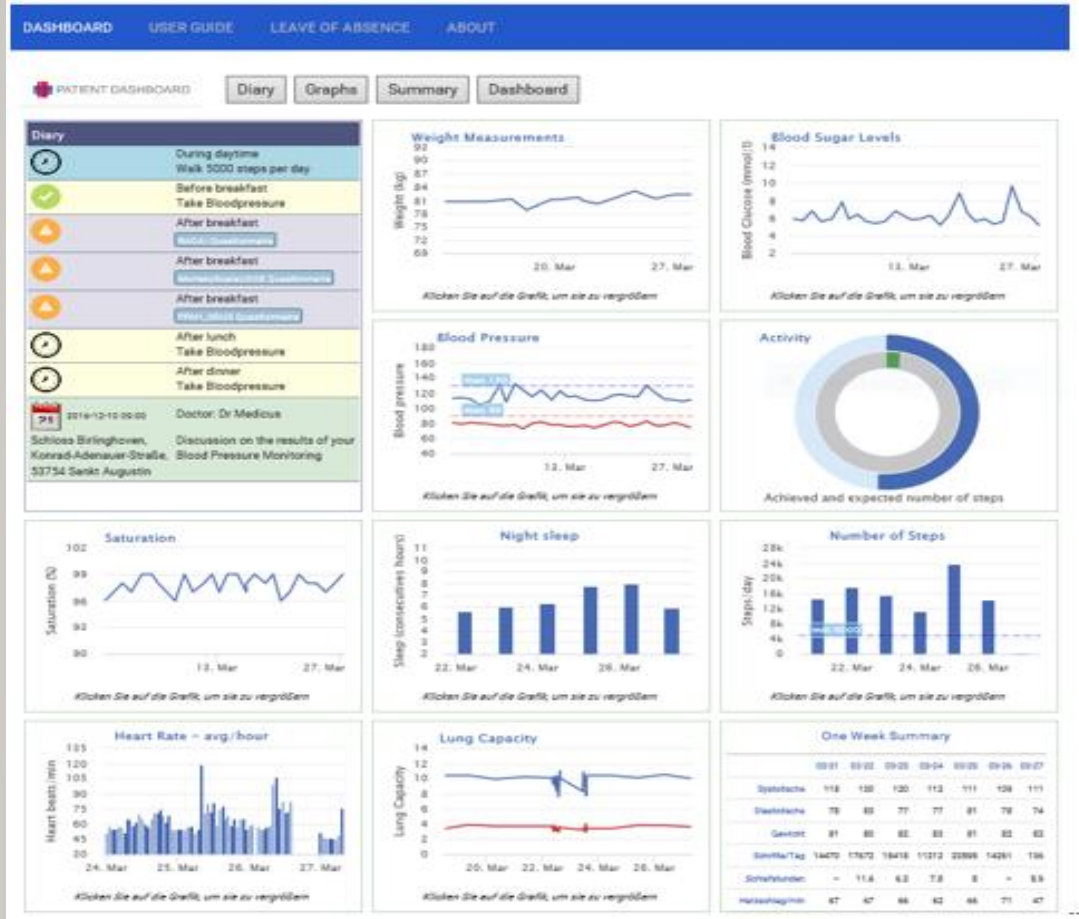
SOMNOX

33% of the adult population are struggling with chronic insomnia according to a study by the National Library of Medicine. Existing sleep medications or sleep aids either come with side effects or just don't work. is here to help people who want to improve their sleep.*

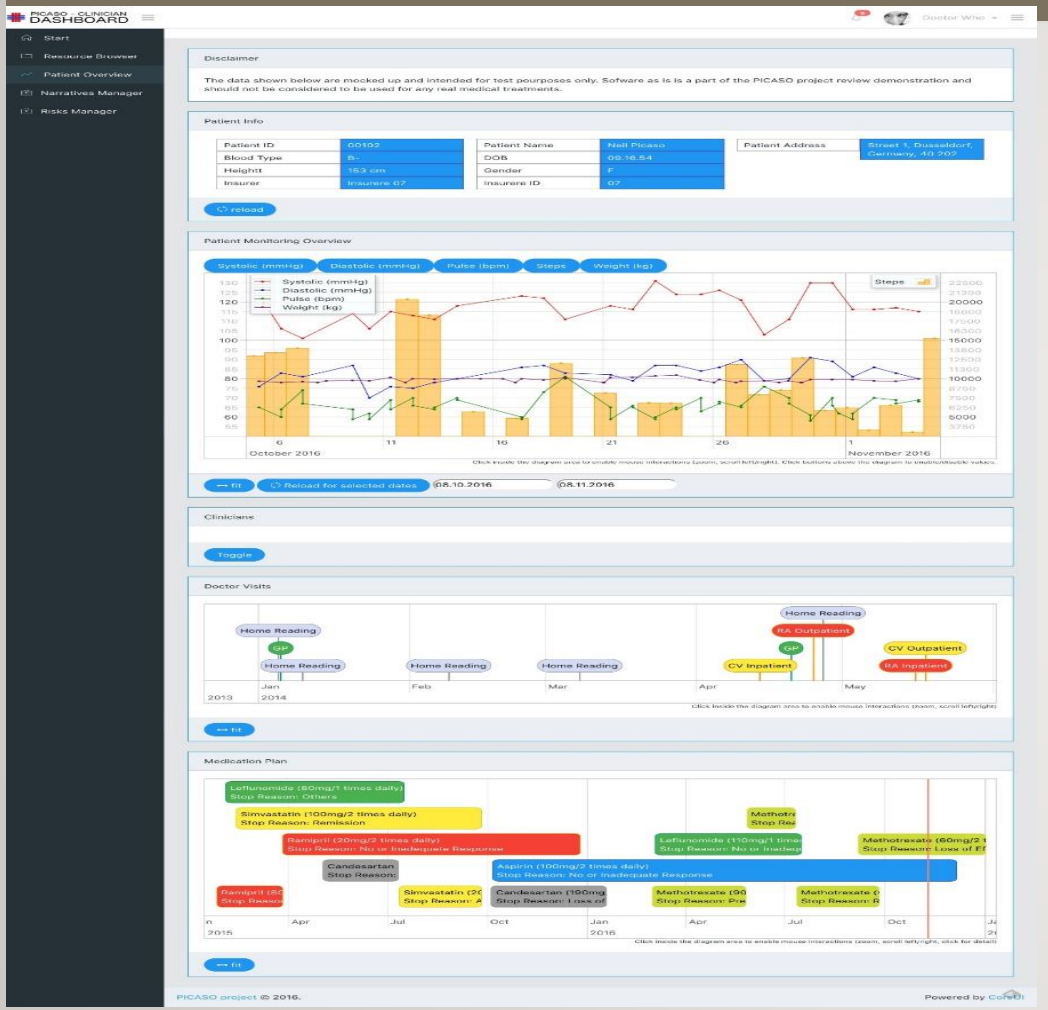
ROBOTIC -TELEMEDICINE

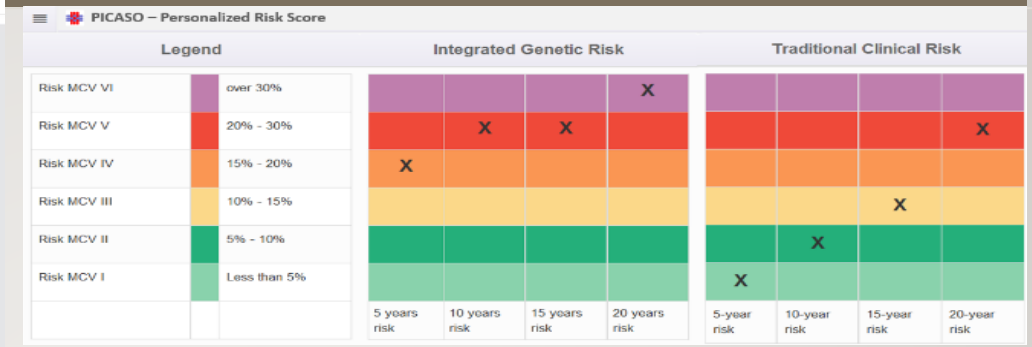


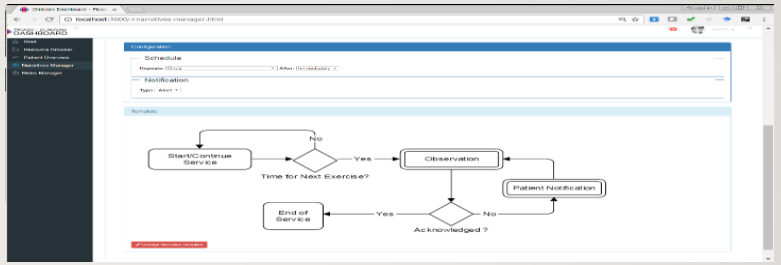
INFORMATIC VITAL SIGN PICTURING FOR UP FOLLOWING CARE

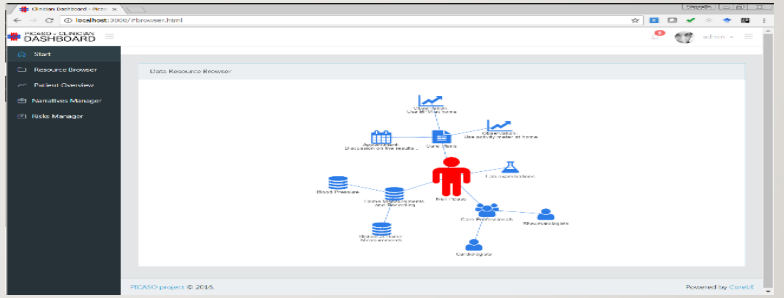


CLINICAL TOOLS TO AVOID ADVERSE DRUG



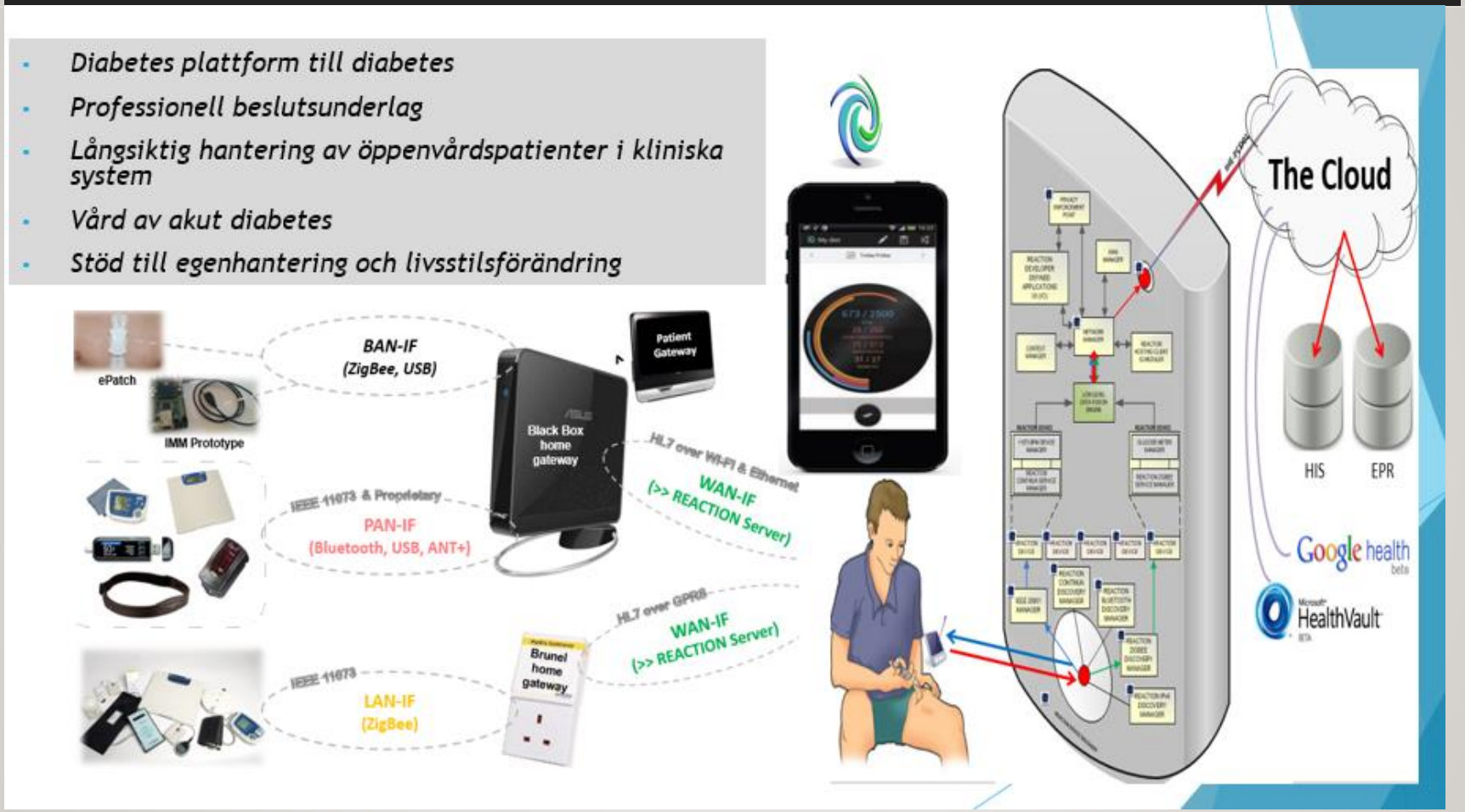






DIABETES-SELF-MANAGEMENT PLATTFORM

- *Diabetes plattform till diabetes*
- *Professionell beslutsunderlag*
- *Långsiktig hantering av öppenvårdspatienter i kliniska system*
- *Vård av akut diabetes*
- *Stöd till egenhantering och livsstilsförändring*

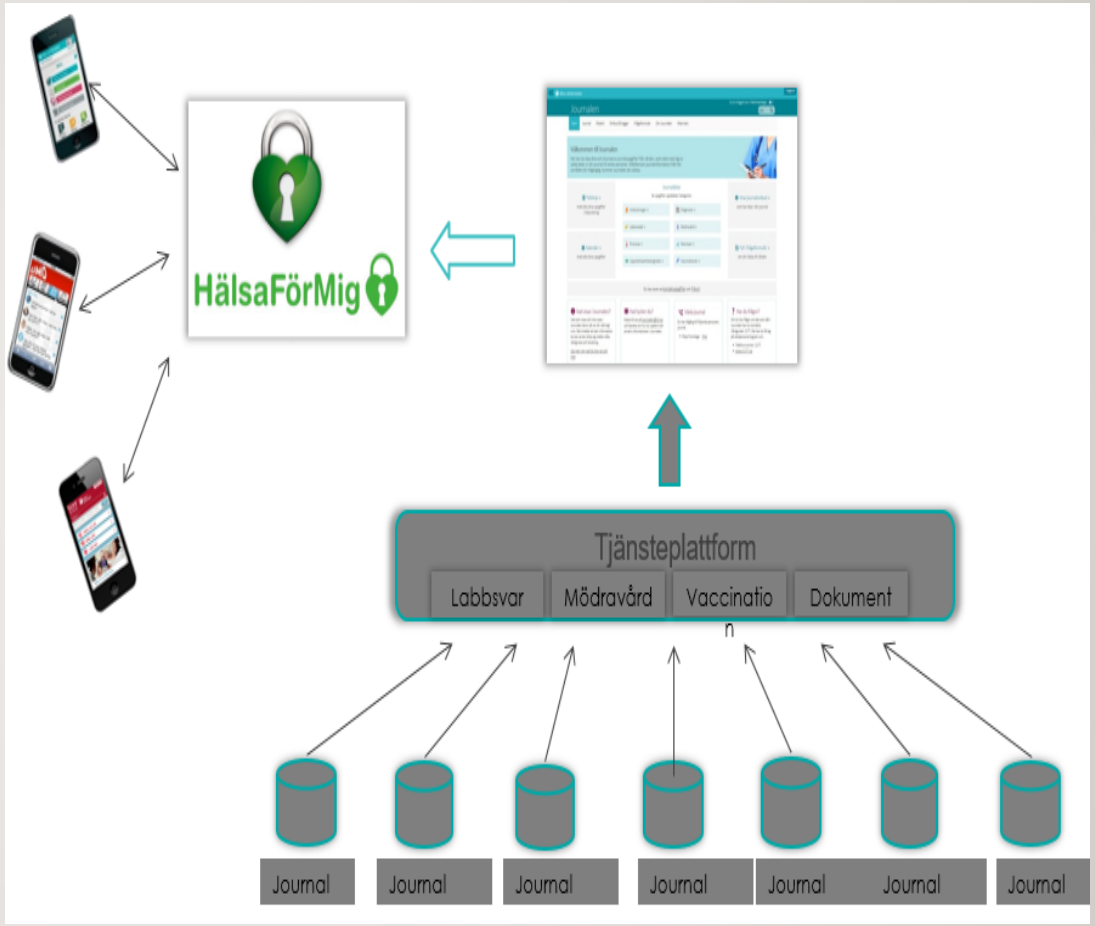


BLOOD PRESSURE –NOT MANUAL TYPING TEXT

NATIONAL HEALTH ACCOUNT FOR SWEDISH

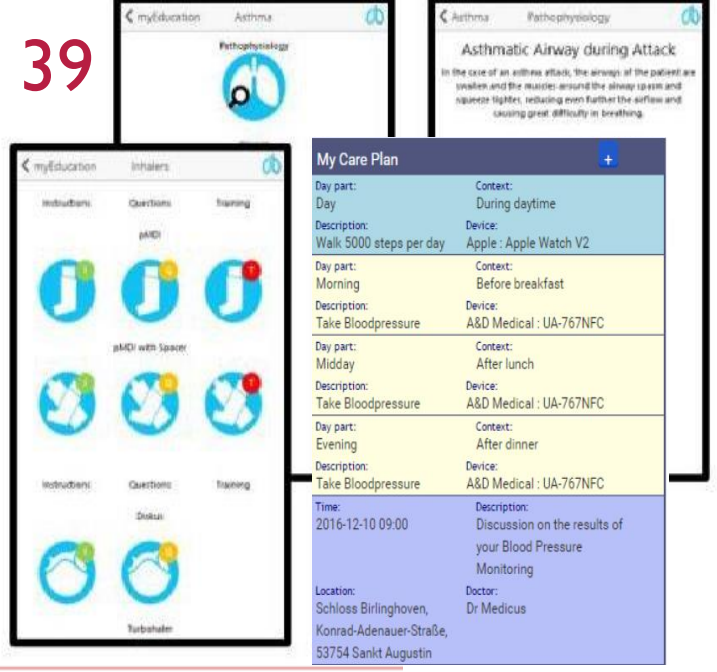
CITIZEN

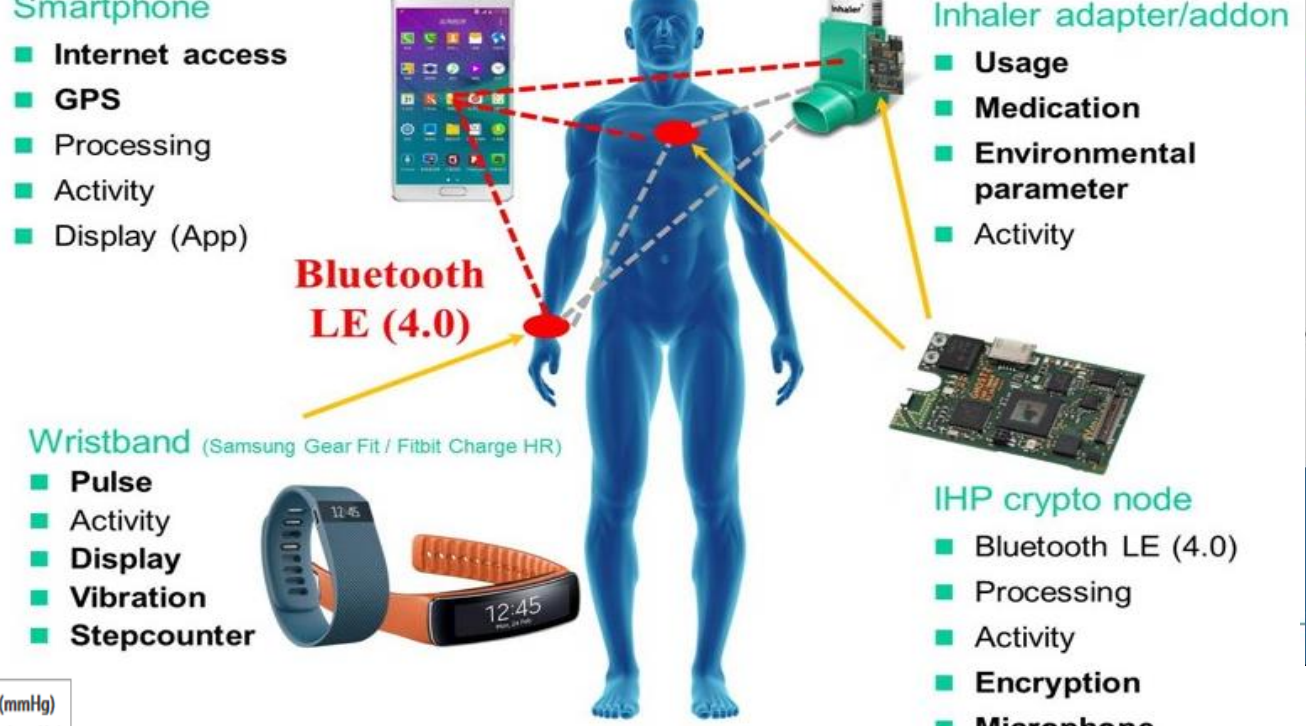
- iPhone app. for connecting all existing Apple Health devices to HFM.
- Hyper Log, app for coaching people to lower their blood pressure.

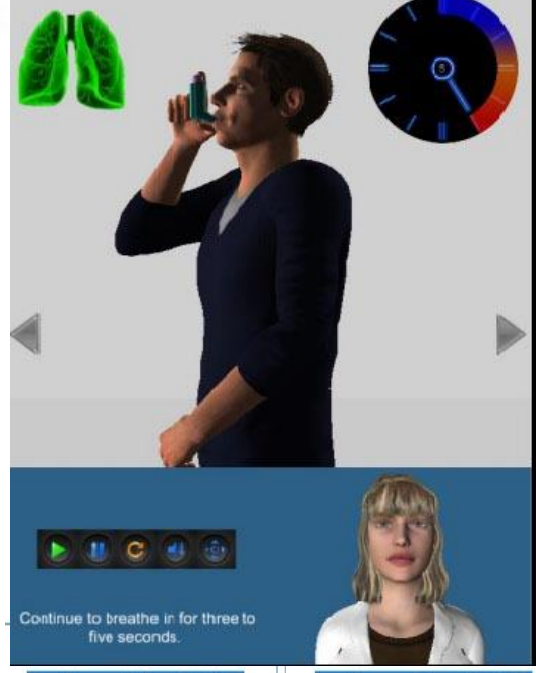


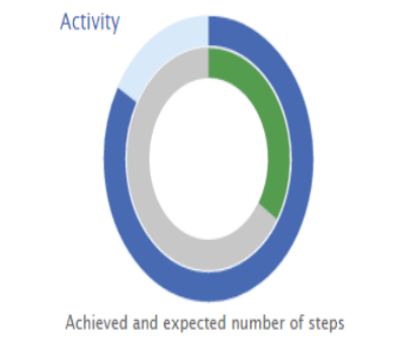
BLOOD PRESSURE EVOLUTION IN NATIONAL HEALTH SERVICES

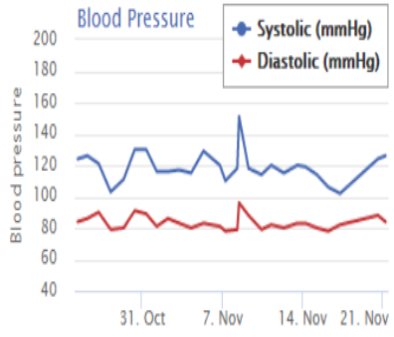
- Blood pressure' app to coach patients for keeping their systolic & diastolic value re in normal ranges
- The measured bloodpressure is sent wirelessly through Bluetooth Smart to phone and onwards to Hälsa För Mig, authentication through Bankid
- All values are stored in HFM and not on phone or in app.

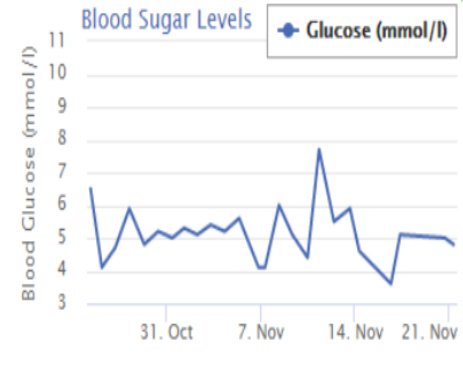

myEducation
Asthma
Pathophysiology
Asthmatic Airway during Attack
myEducation
Inhalers
Instructions
Questions
Training
pMDI
pMDI with Spacer
Turbohaler
My Care Plan
Day part: Day
Context: During daytime
Description: Walk 5000 steps per day
Device: Apple : Apple Watch V2
Day part: Morning
Context: Before breakfast
Description: Take Bloodpressure
Device: A&D Medical : UA-767NFC
Day part: Midday
Context: After lunch
Description: Take Bloodpressure
Device: A&D Medical : UA-767NFC
Day part: Evening
Context: After dinner
Description: Take Bloodpressure
Device: A&D Medical : UA-767NFC
Time: 2016-12-10 09:00
Description: Discussion on the results of your Blood Pressure Monitoring
Location: Schloss Birlinghoven, Konrad-Adenauer-Straße, 53754 Sankt Augustin
Doctor: Dr Medicus


Smartphone
Internet access
GPS
Processing
Activity
Display (App)
Bluetooth LE (4.0)
Inhaler adapter/addon
Usage
Medication
Environmental parameter
Activity
Wristband (Samsung Gear Fit / Fitbit Charge HR)
Pulse
Activity
Display
Vibration
Stepcounter
12:45
IHP crypto node
Bluetooth LE (4.0)
Processing
Activity
Encryption
Microphone


Continue to breathe in for three to five seconds.


Activity
Achieved and expected number of steps


Blood Pressure
Systolic (mmHg)
Diastolic (mmHg)
Blood pressure
200
180
160
140
120
100
80
60
40
31. Oct
7. Nov
14. Nov
21. Nov


Blood Sugar Levels
Glucose (mmol/l)
Blood Glucose (mmol/l)
11
10
9
8
7
6
5
4
3
31. Oct
7. Nov
14. Nov
21. Nov

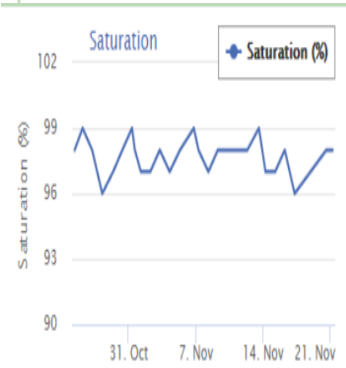
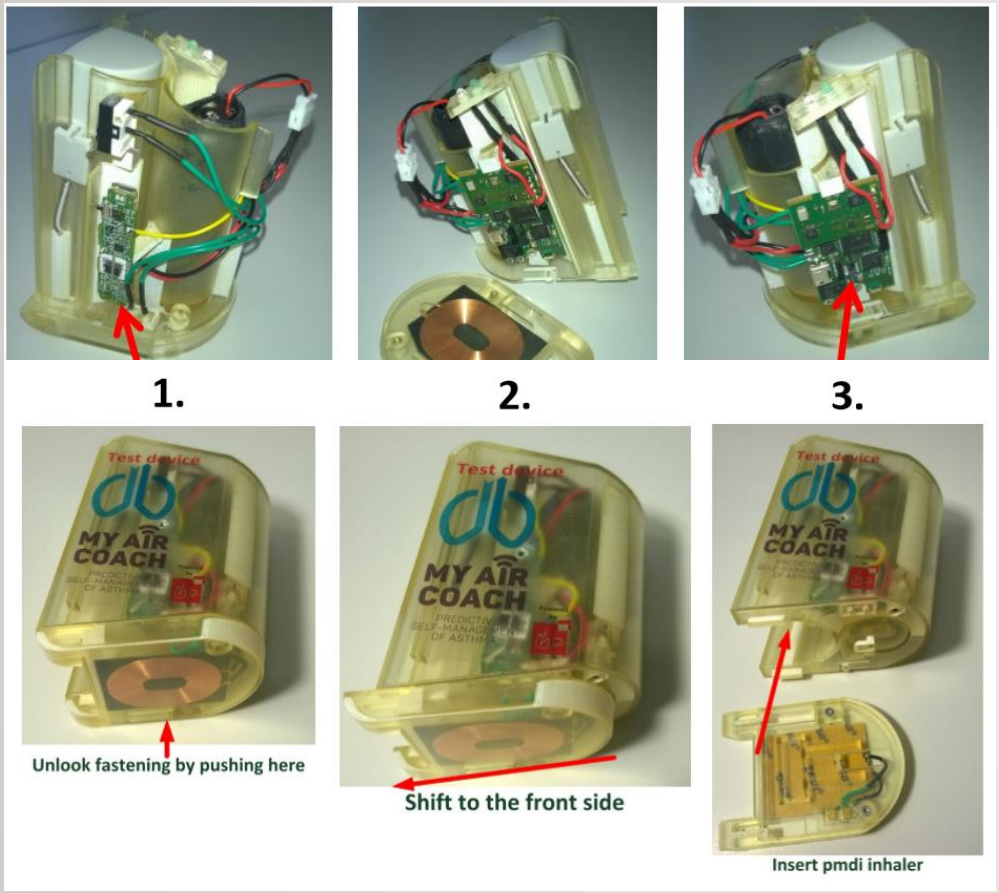

Saturation
Saturation (%)
Saturation (%)
102
99
96
93
90
31. Oct
7. Nov
14. Nov
21. Nov

Image-based Food Diary
Buddy Step Counter Activity Tracker USB
BuddyBand2 Activity & Sleep Tracker Bluetooth
Wellness/Medicine Diary
Pulse Oximeter2 Bluetooth
Bluetooth
Bacterial Biomarker Respiratory Tool
Blood Pressure Bluetooth
SmartOne Peak Flow & FEV. Meter Bluetooth
Contactless Infrared Thermometer Bluetooth
Body Analyser Bluetooth

Open data Sthlm
Open data Sthlm
Map
Details
SENSOR
VALUE
PM10
10.9 µg/m³
24H HISTORY
11:00
27 µg/m³

COMMUNICATION FLOW AMONG PEERS

SMART INHALER - MYAIRCOACH



MONITOR AIRWAY INFLAMMATION -ASTHMA

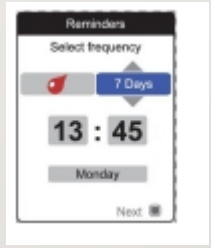
- FeNO measurement
- Asthma management
  - diagnosis of
  - poor control or not
- Steroid –responsiveness
  - Determine dosage

Niox Vera

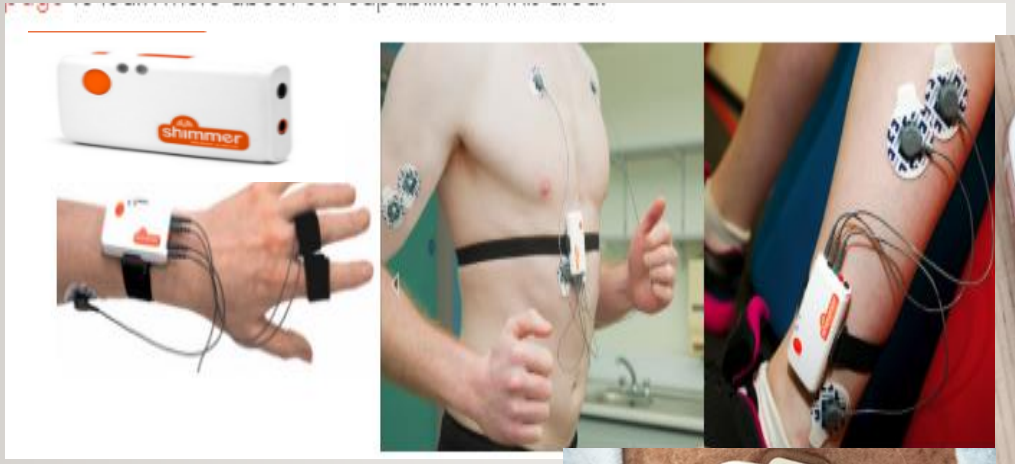
https://www.youtube.com/watch?v=Fhkff8YfeTk

ASTHMAWATCH

INR –SELF-MONITORING @ HOME



ECG-SENSORS


shimmer

Record EKG
Great Signal
24
70 BPM
How are you feeling?
Kardia

63

74
slag/minut
COALA

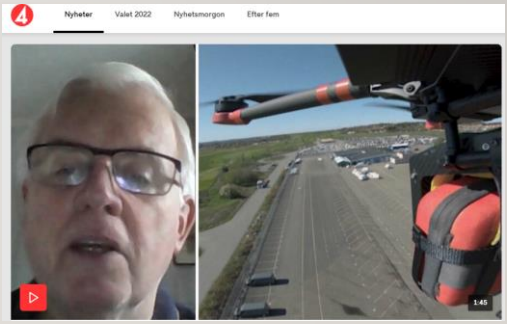
COALA – ARRYTHMIAS DETECTION

RESPIRATORY RATE

- **Inhalation/exhalation ratio**
- **Calm score/anxiety**
- **Heart rate**
- **Pain**

KAROLINSKA INSTITUTE & SOS ALARM

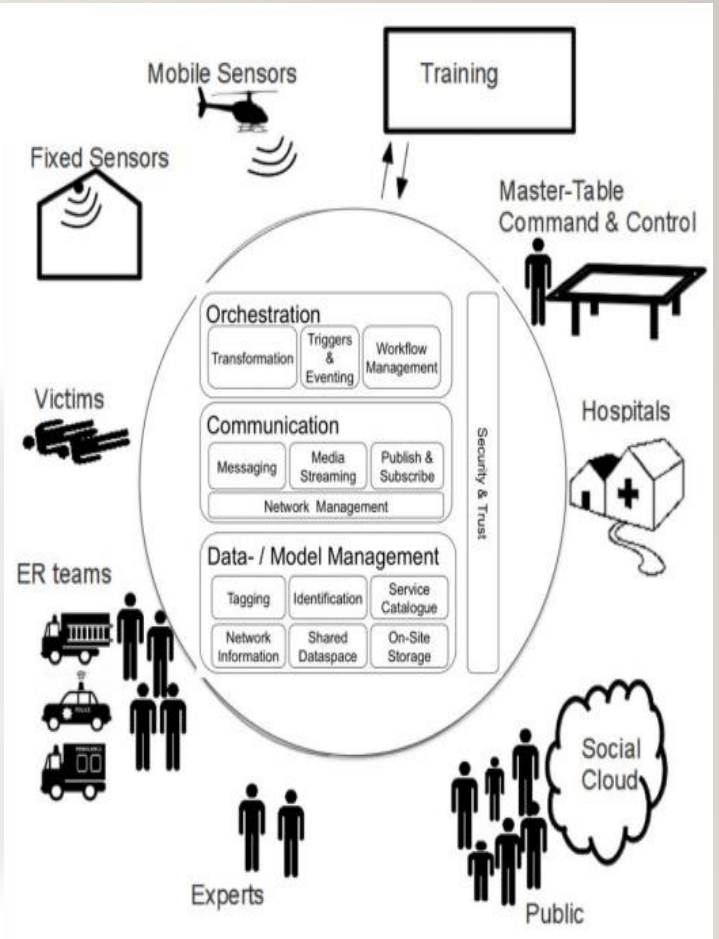
- 99 % automatically by human supervised
- Delivery of defibrillator
- January 2022 -71-year, cardiac arrest when he was shoveling snow from the garage entrance



FIRST & SECOND TRIAGE –IOMT

- Global position system (GPS)
- Infererade kamera & video
- Advanced monitoring
- Integrated first aid & rescue aid
- Dynamic resources management
- Bracelet with integrated GPS and attached pulse sensors
- Flying plattform with hexa helicopter
- START+NHS-EES+RETTS (Algorithms based on 4 emergency protocol s to deal with details in triage handling and rising accuracy of Algorithms

AUTOMATED CRISIS MANAGEMENT— SENIOR CITIZENS



Intelligent Digital Voice Assistant for Remote Patient Monitoring

VoiceRPM digital assistant improves the efficiency and efficacy of caregivers' scheduled visits and check-ups and sends customizable text alerts and daily reports directly to the care team.

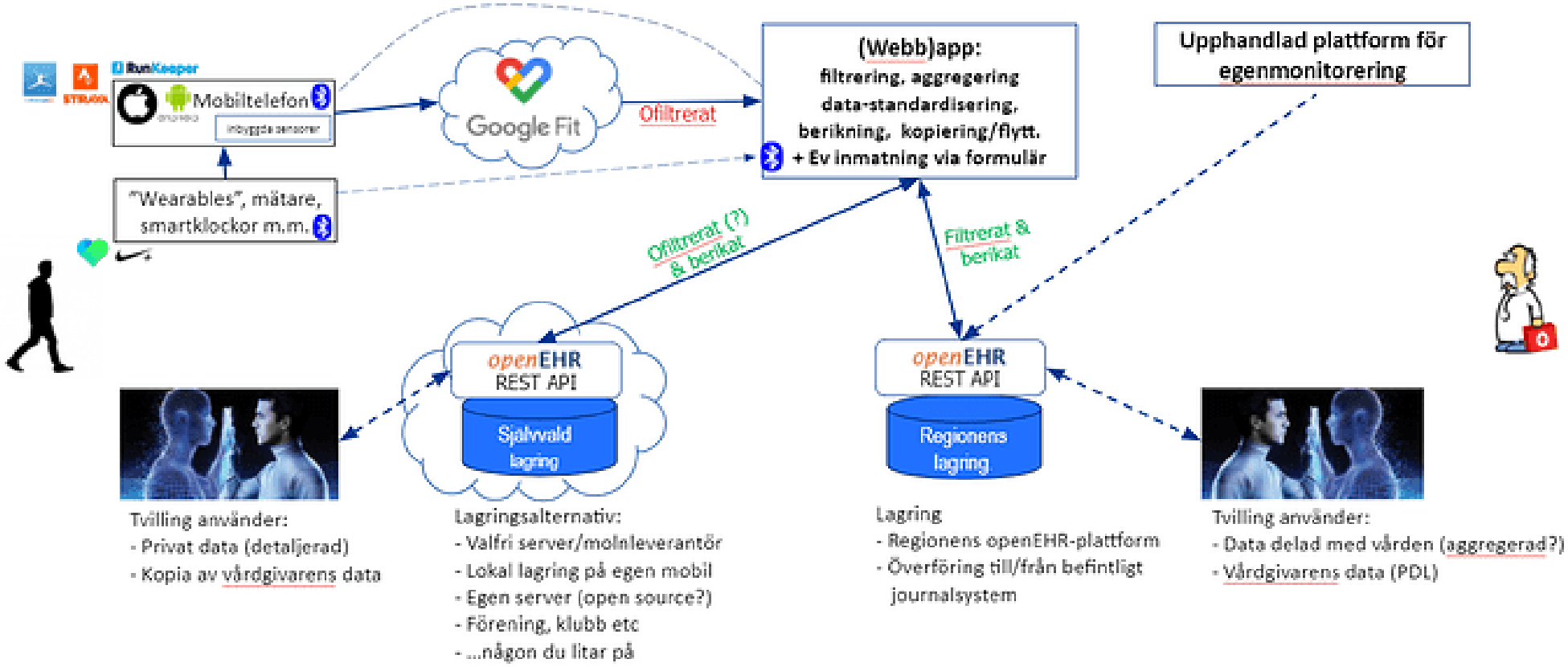
https://checkhealth.se/voicerpm/

Usage in the ”health conversation”

- A Swedish study, originally done in Västerbotten, in Sweden
- All people turning 40, 50, and 60, are called in for an extensive examination, followed by an open-ended health-conversation
- Survival rates have since improved by several years, risk of CVD reduced > 50%, etc. ***Prevention effect!***
- We want to ***magnify this effect***, by also giving patients access to their digital twin
- The hope is to see ***more preventive measures***, a ***higher compliance*** to treatments, better patient-doctor ***communication***, a better way to ***integrate versatile data*** sources, etc

Egna hälsodata + Digital tvilling + Egenmonitorering

openEHR



Tvilling använder:
- Privat data (detaljerad)
- Kopia av vårdgivarens data

Lagringsalternativ:
- Valfri server/molnleverantör
- Lokal lagring på egen mobil
- Egen server (open source?)
- Förening, klubb etc
- ...någon du litar på

Lagring
- Regionens openEHR-plattform
- Överföring till/från befintligt journalsystem

Tvilling använder:
- Data delad med vården (aggregerad?)
- Vårdgivarens data (PDL)

THANK YOU!

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