



**NST** | Norwegian Centre for Telemedicine  
UNIVERSITY HOSPITAL OF NORTH NORWAY  
WHO Collaborating Centre for Telemedicine



# Diabetesdagboka

**Bruker-involvert design av mobile selvhjelpsverktøy for mennesker med Diabetes**

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Nasjonalt senter for Samhandling og Telemedisin,  
Universitetssykehuset Nord-Norge



# Used methods

- Focus group (15-12 Type 2'ere for 3 yrs)
  - Paper prototyping / prototyping
  - Thinking aloud
  - Scenarios
  - Questionnaire
  - Interview
  - Automatic logging
- and, a lot of testing and re-prototyping



# The concept: a digital diabetes diary

*Providing users with a better overview of their disease-related habits, in a unit that is “always” with them*

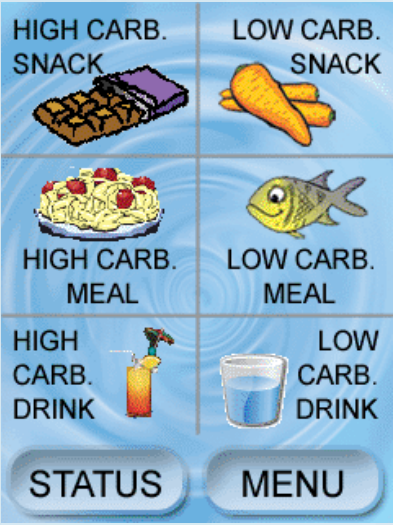
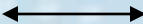
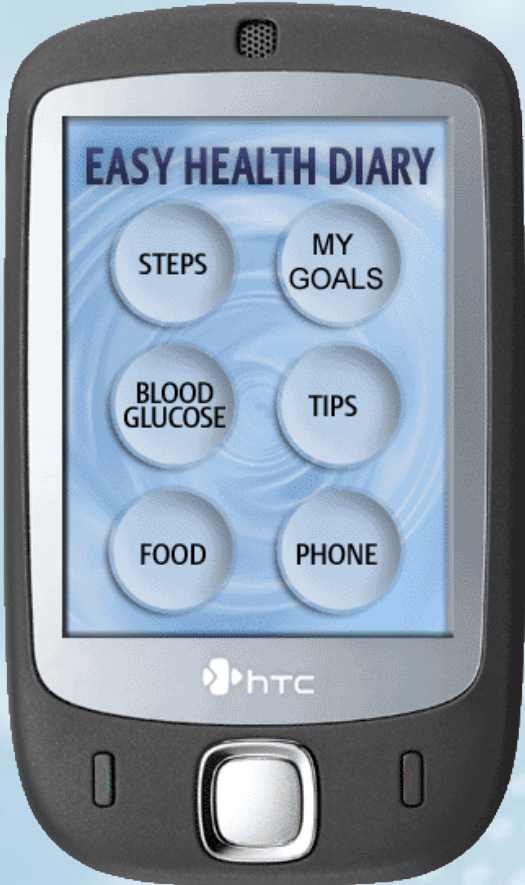


# Results

(designs achieved)

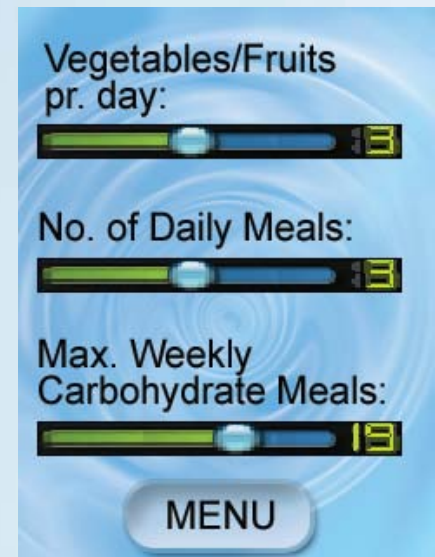
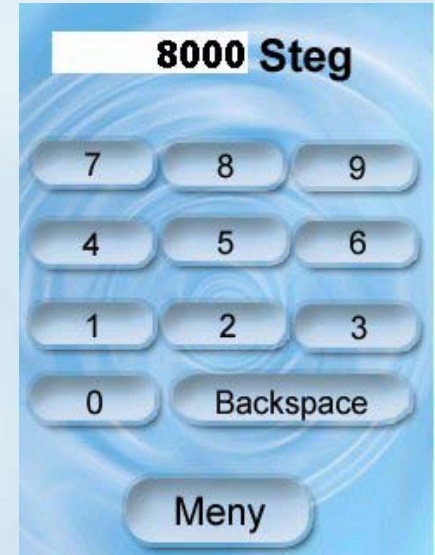
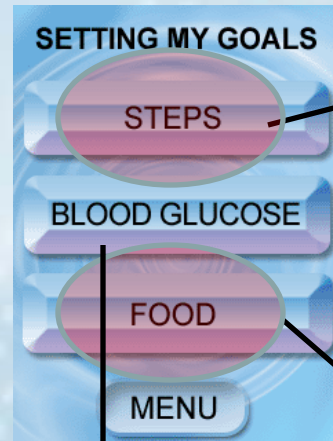
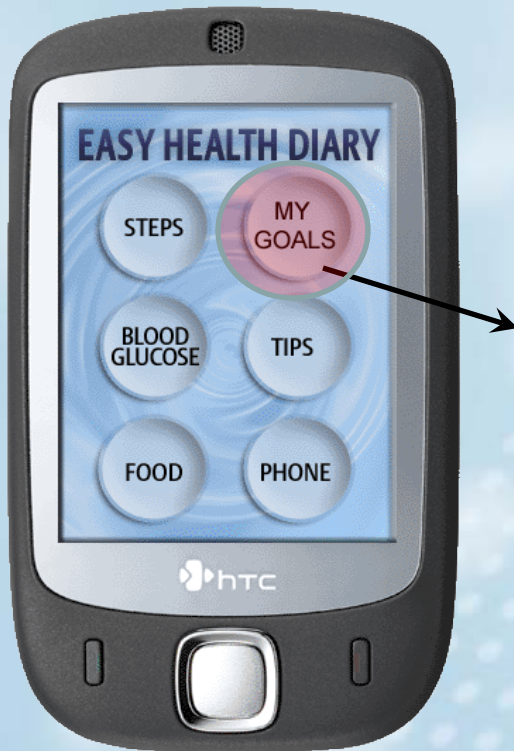


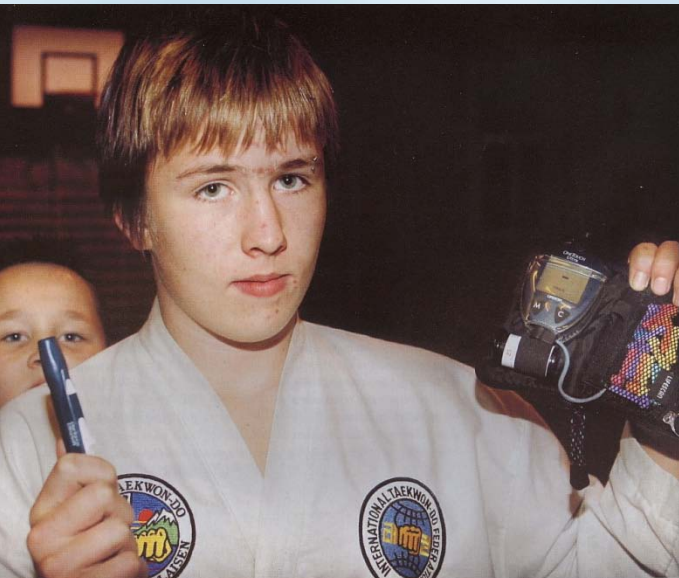
# Elements



# Goal Setting element

Results - designs acheived





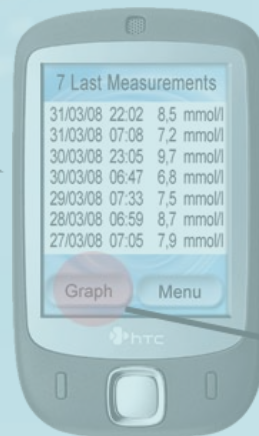
# Type 1 diabetes Sensor System (data to parents)



Automatically sent  
as SMS



# Type 2 diabetes (self-help)

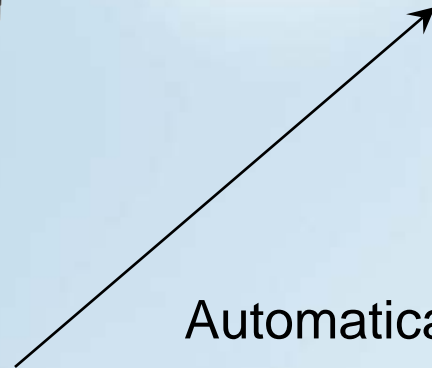
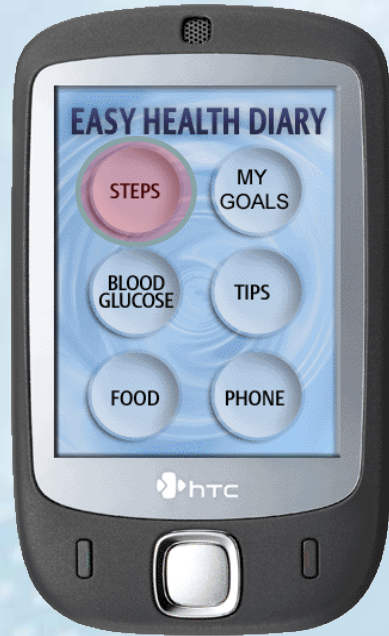


Automatically transfer  
after measurement



# Physical activity sensor systems

Results - designs achieved

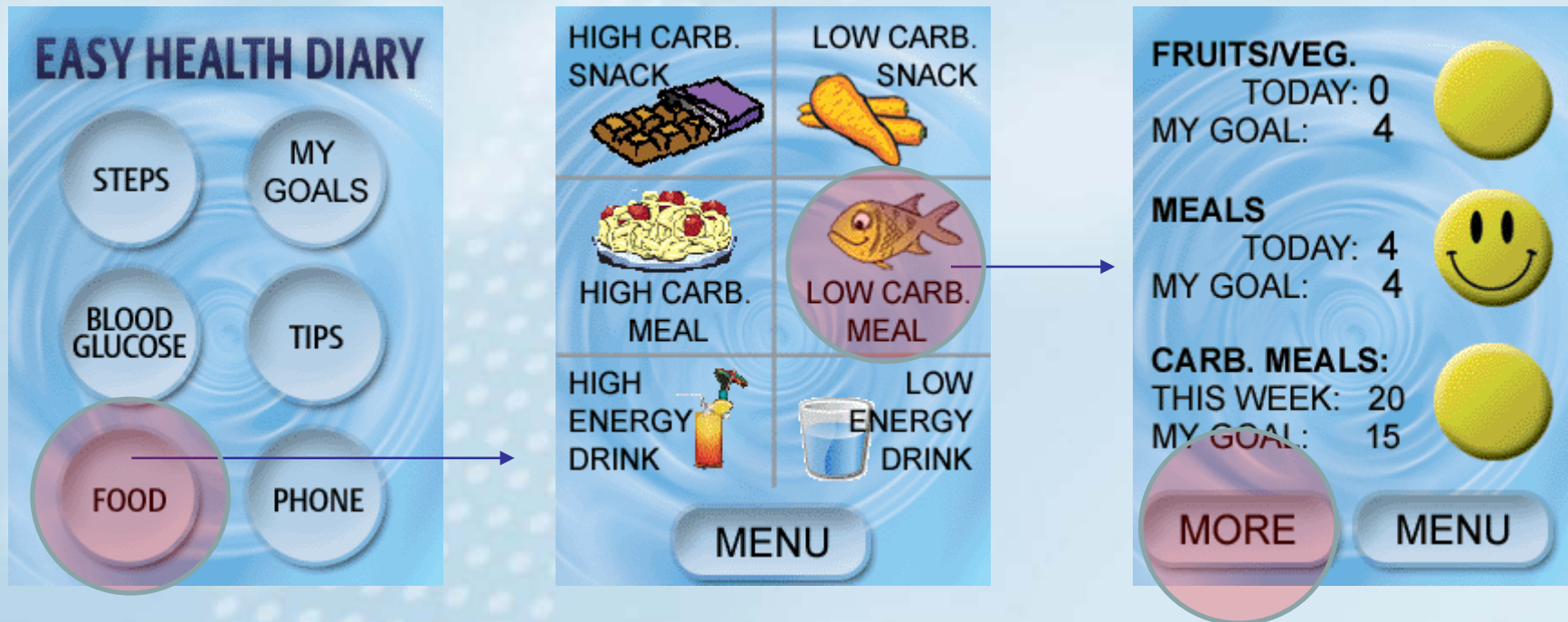


Automatically at 22:00

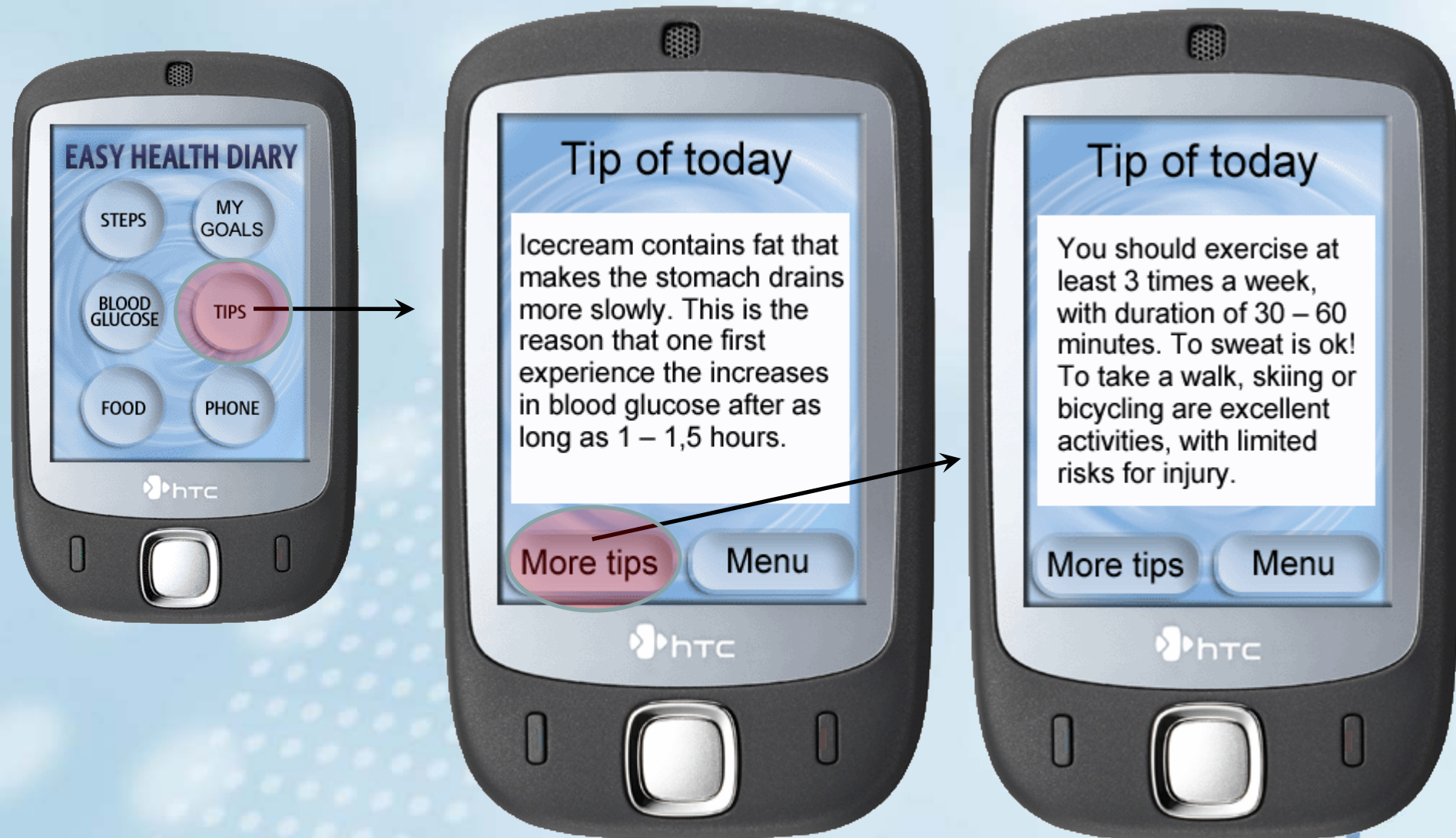
(or button)



# Nutrition Habit Registration System



# General information



# Results

(User-interventions)



# Food Habit Registration

Table 4. Types of food intake recorded by the individual 12 users (6 months trial).

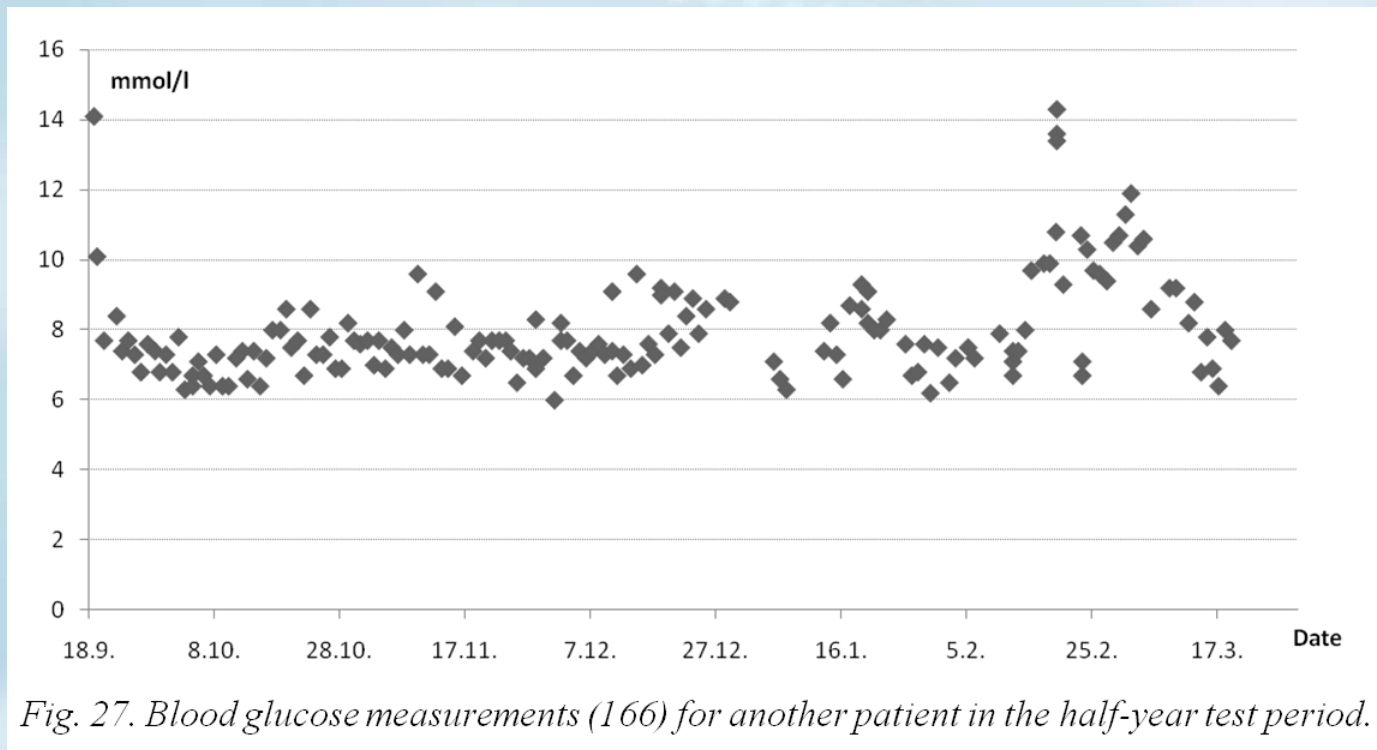
User	High carb. Snack	Low carb. Snack	High carb. Meal	Low carb. Meal	High carb. Drink	Low carb. Drink	Total recordings
User 1	0	106	14	206	21	166	513
User 2	8	29	10	36	7	31	121
User 3	41	417	15	623	35	738	1869
User 4	0	4	4	10	2	20	40
User 5	73	216	37	229	72	424	1051
User 6	34	404	26	440	20	578	1502
User 7	37	75	73	199	19	168	571
User 8	431	154	551	98	474	433	2141
User 9	1	5	2	1	1	4	14
User 10	8	21	20	143	1	159	352
User 11	28	221	96	349	2	4	700
User 12	25	338	15	457	7	436	1278

- average user registered 4.6 daily food and drinks
- the most frequent user had a usage of 11.7 daily inputs

*"This is a tool that can help you to learn more about yourself, but sometimes I become tired of recording what I eat each day."*



# Blood Glucose Monitoring



- average use was 202 measurements during 167 days
- average BG = 7.9 mmol/l

*"I think it is nice to get this blood glucose graph and see how I am doing, and then I can think back on what I ate."*



# Physical activity

Results – user interventions

Table 8. Statistics for use of the physical activity sensor system, and average steps.

User	Days of use	No. of readings	Avg. first week (*)	Avg. last week(*)	Max. steps
User 1	48	220	10222	9489	19063
User 2	63	59	5574	6208	10843
User 3	54	54	1760	2515	5144
User 4	56	58	7163	11284	15193
User 5	89	103	7094	10000	16860
User 6	60	226	3839	3038	7170
User 7	32	51	3717	5588	6581
User 8	50	93	4118	5988	11028
User 9	60	89	4813	5317	16363
User 10	40	62	2927	2763	4376
User 11	55	134	9508	10301	20222
User 12	91	98	3522	5013	7796
<b>Average</b>	<b>58</b>	<b>104</b>	<b>5355</b>	<b>6459</b>	<b>11720</b>

(\*) The first and last week averages are calculated based on the nearest 7 days with valid recordings. This is because there are generally some days in a full week where data is not transferred.

- average manually daily transfer = 0.88 (physical button)
- viewing the bar graph in average 7.25 times a week

*“The step counter has had the result that – I have a rather routine job – when I drive to a meeting, I park as far as possible from the door, and even make a detour. Before – I parked as close as possible.”*



# Quotes – after 4 months



# Publications

- Usability of a Mobile Self-Help Tool for People with Diabetes: the Easy Health Diary, by Årsand E, Varmedal R, and Hartvigsen G. IEEE Press, 2007, pp. 863-868
- User-centered methods for designing patient-centric self-help tools, by Årsand E, and Demiris G. "Informatics for Health & Social Care", September 2008, pp. 158-169.
- No-Touch Wireless Transfer of Blood Glucose Sensor Data, by Årsand E, Andersson N, and Hartvigsen G. COGNitive systems with Interactive Sensors 2007 (COGIS '07).
- A System for Monitoring Physical Activity Data Among People with Type 2 Diabetes, by Årsand E, Olsen OA, Varmedal R, Mortensen W, and Hartvigsen G. Studies in Health Technology and Informatics, IOS Press, 2008 pp. 113-118.
- Designing Mobile Dietary Management Support Technologies for People with Diabetes, by Årsand E, Tufano JT, Ralston J, and Hjortdahl P. Telemedicine and Telecare 2008, pp. 329-332
- Parent-Child Interaction Using a Mobile and Wireless System for Blood Glucose Monitoring, by Gammon D, Årsand E, Walseth OA, Andersson N, Jenssen M, and Taylor T. Journal of Medical Internet Research, 2005, pp.e57.
- Using Blood Glucose Data as an Indicator for Epidemic Disease Outbreaks, by Årsand E, Walseth OA, Andersson N, Fernando R, Granberg O, Bellika JG and Hartvigsen G. Studies in Health Technology and Informatics, pp. 217-222.





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EU-prosjektet

# RENEWING HEALTH

REgionNs of Europe WorkINg toGether for HEALTH

Siri Bjørvig  
Geir Østengen



# RENEWING HEALTH

## REgionNs of Europe WorkINg toGether for HEALTH

- CIP – EUs rammeprogram for konkurranseevne og innovasjon
- IKT programmet (ICT PSP)
- Tema: IKT for pasient-sentrerte helsetjenester
- Myndighetstøtte fra HoD
- 9 helseregioner i Europa
- Prosjektstart: 1. januar 2010
- Prosjektperiode: 32 måneder
- Totalbudsjett: 14.000.000 €
- 50% egeninnsats



# RENEWING HEALTH

## REgioNs of Europe WorkINg toGether for HEALTH

- Pilot Type A – storskala utbredelse av eksisterende løsninger som;
  - Gjør pasienten bedre i stand til å håndtere egen sykdom
  - Gir bedre beslutningstøtte for helsepersonell
  - Støtter et helhetlig pasientforløp gjennom bedret samhandling
- Hjerte/kar, KOLS, Diabetes
- Effektivitet skal testes med basis i vitenskapelig evalueringsmodeller
  - Klinisk, pasient/bruker, økonomi, organisasjon
- MethoTelemed – Methodology to Assess Telemedicine Applications

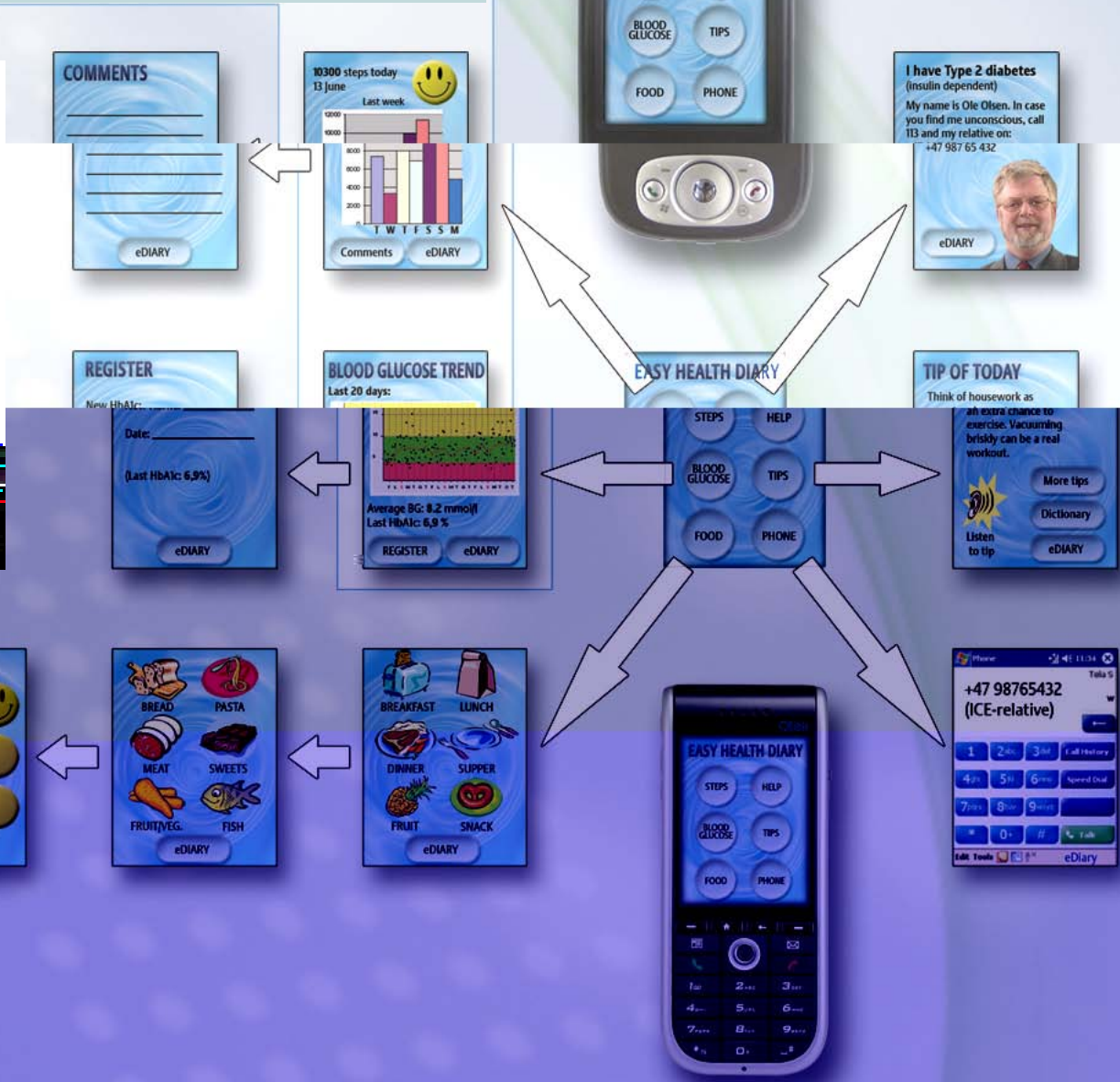


# Partnere

Number	Full name	Short name	Country
1	Regione Veneto	VENETO	Italy
2	Region Syddanmark	RSD	Denmark
3	County Council of Norrbotten	CCN	Sweden
4	Centre for Distance-spanning Healthcare	CDH	Sweden
5	Northern Norway Regional Health Authority	NORNORWAY	Norway
6	Departament de Salut de la Generalitat de Catalunya	DSGC	Spain
7	Agència d'avaluació de Tecnologia i recerca Mèdiques (Catalan Agency for Health Technology Assessment and Research)	CAHTA	Spain
8	South Karelia Social and Health Care District	EKSOTE	Finland
9	Digital Cities of Central Greece S.A.	DCCG	Greece
10	e-Trikala	e-TRIKALA	Greece
11	Municipality of Trikala	TR	Greece
12	Regional Health Authority of Sterea & Thessaly	5TH DYPE	Greece
13	European Patient's Forum	EPF	Belgium
14	European Health Telematics Association	EHTEL	Belgium
15	Continua Health Alliance	CHA	Belgium
16	Fundació Privada Centre TIC i Salut	TICSALUT	Spain
17	Krankenanstalten Betriebsgesellschft	KABEG	Austria
18	Ministry of Health of Carinthia	CARINTHIA	Austria
19	Technologiestiftung Berlin	TSB	Germany
20	Pflegewerk Management GmbH	MEDIPLUS	Germany



# Utvikle den **mobile** diabetesdagboka fra et selvhjelpsverktøy til en interaktiv helsetjeneste



Et diabetesverktøy for pasienten  
som han alltid har tilgjengelig,  
som alltid kan bidra til litt mer læring,  
og som gjør han mindre alene med sin diabetes

Sensor registrering og overføring kombinert med  
manuell registrering og kommentarmulighet.

Sette mål og kunne følge opp hvordan man når  
målene

Diabetes oppslagsverk, synkront og asynkront  
nettverk med andre pasienter og helsepersonell



# Intervensjon

**Randomisert forsøk med 300 pasienter**

**1. I-care, Høyskolen I Oslo**

I-care: stimulating self-management in patients with diabetes.

**2. “FewTouch”**

Selvhjelpsverktøy tilpasset bruk i en behandlingssituasjon

**3. Kontrollgruppe**



Vil du vite mer?  
Vil du være med å utvikle  
intervensjonen?

Ta kontakt!

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