fibion SENS

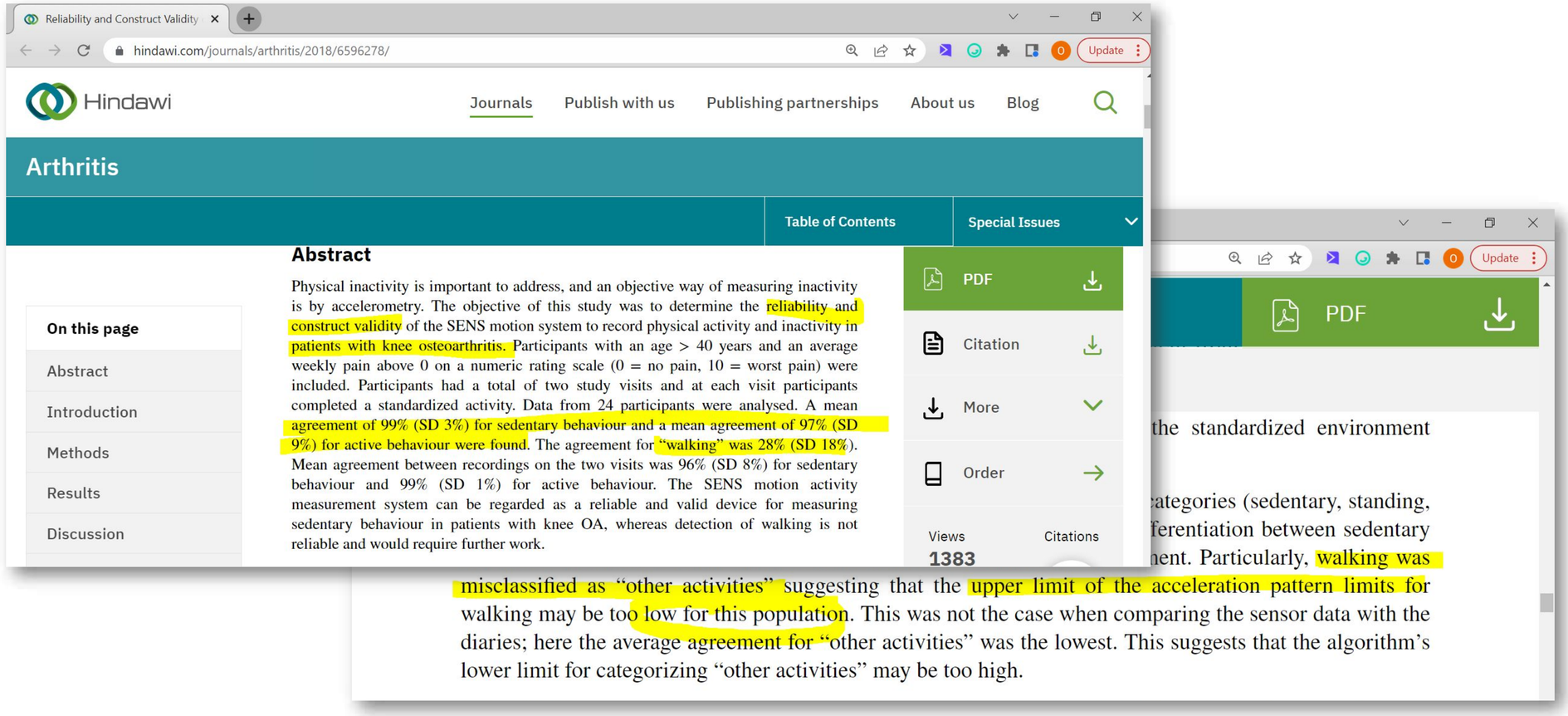
The New Age of Activity Tracking

Fibion SENS Validity and Reliability

fibionSENS

Fibion SENS Validity and Reliability – 2018 Study*

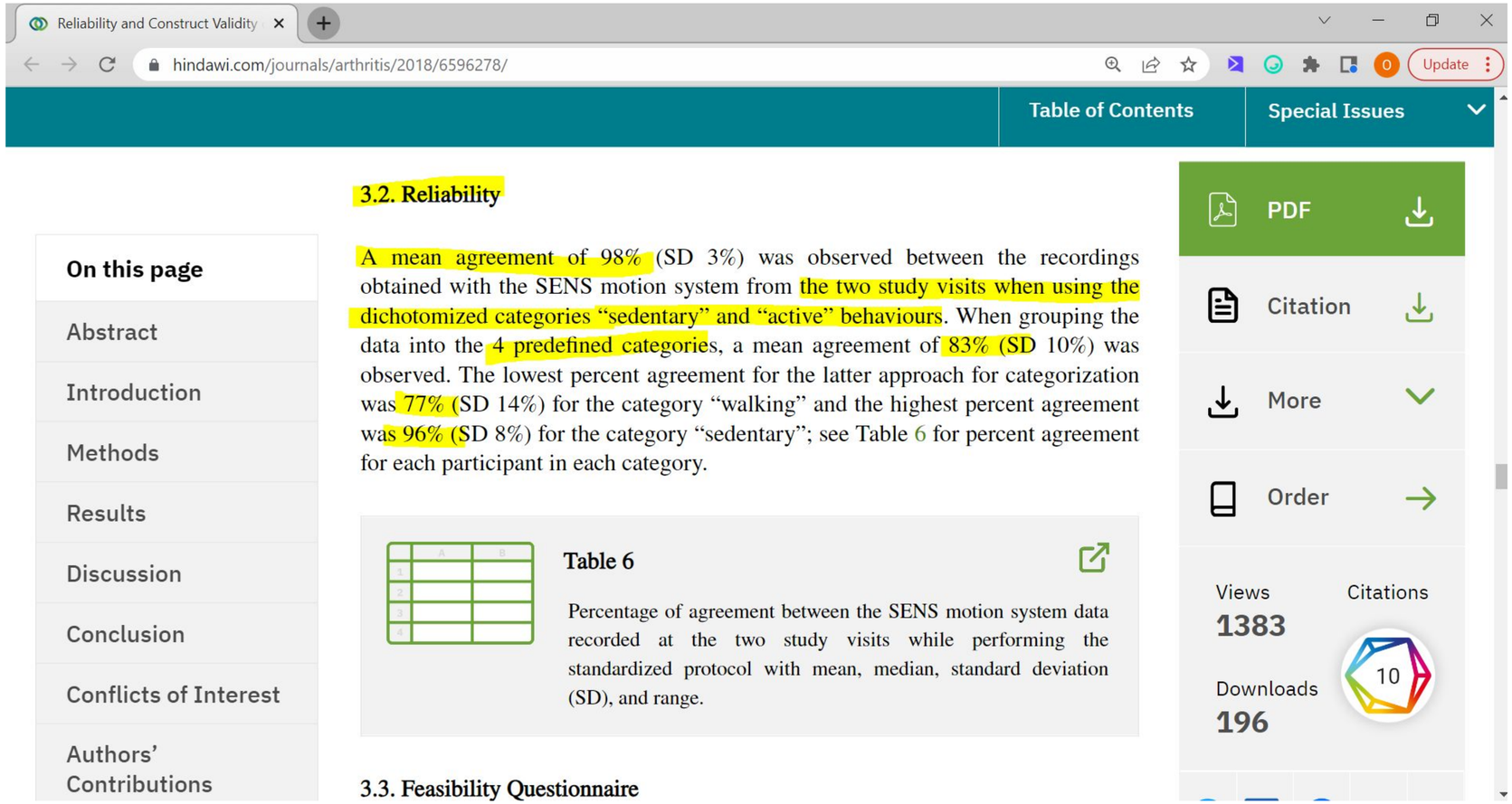
- **SENS is reliable and valid for measuring sedentary behavior and activity in patients with knee osteoarthritis**. Walking is not easily detected and can be misclassified with “other activities” for this population.



Source: https://www.hindawi.com/journals/arthritis/2018/6596278/

Fibion SENS Validity and Reliability: 2018 Study**

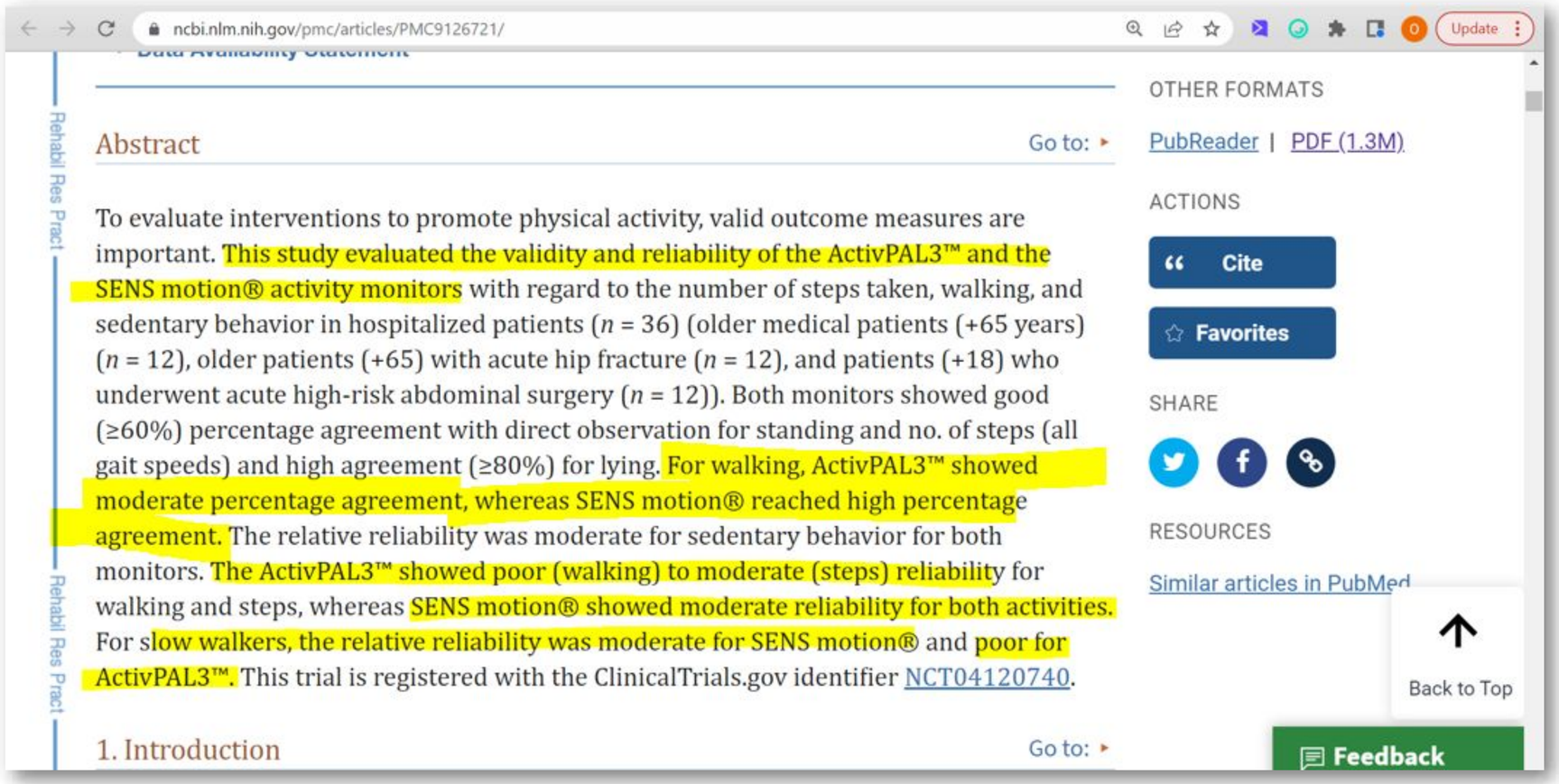
- **Good reliability**: SENS showed 98% agreement for sedentary vs. active behaviors and 83% for four-category classification, with the highest agreement for sedentary (96%) and the lowest for walking (77%).



Source: https://www.hindawi.com/journals/arthritis/2018/6596278/

Fibion SENS Validity and Reliability – 2022 Study

- **SENS device has demonstrated superior validity and relative reliability compared to ActivPAL,** which is regarded as a near gold-standard activity monitor.



ncbi.nlm.nih.gov/pmc/articles/PMC9126721/

Update

Rehabil Res Pract

Rehabil Res Pract

Abstract

Go to:

To evaluate interventions to promote physical activity, valid outcome measures are important. This study evaluated the validity and reliability of the ActivPAL3™ and the SENS motion® activity monitors with regard to the number of steps taken, walking, and sedentary behavior in hospitalized patients (n = 36) (older medical patients (+65 years) (n = 12), older patients (+65) with acute hip fracture (n = 12), and patients (+18) who underwent acute high-risk abdominal surgery (n = 12)). Both monitors showed good (≥60%) percentage agreement with direct observation for standing and no. of steps (all gait speeds) and high agreement (≥80%) for lying. For walking, ActivPAL3™ showed moderate percentage agreement, whereas SENS motion® reached high percentage agreement. The relative reliability was moderate for sedentary behavior for both monitors. The ActivPAL3™ showed poor (walking) to moderate (steps) reliability for walking and steps, whereas SENS motion® showed moderate reliability for both activities. For slow walkers, the relative reliability was moderate for SENS motion® and poor for ActivPAL3™. This trial is registered with the ClinicalTrials.gov identifier NCT04120740.

1. Introduction

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Source: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC9126721/

Fibion SENS Validity and Reliability – 2022 Study

- Study found that **SENS has high validity and reliability in measuring gait accelerations in patients with knee osteoarthritis**, showing strong agreement with the validated Xsens system.

Sensors (Basel). 2022 Jul 15;22(14):5289. doi: 10.3390/s22145289.

Criterion Validity of Linear Accelerations Measured with Low-Sampling-Frequency Accelerometers during Overground Walking in Elderly Patients with Knee Osteoarthritis

Arash Ghaffari [1], Ole Rahbek [1], Rikke Emilie Kildahl Lauritsen [1], Andreas Kappel [1], Søren Kold [1], John Rasmussen [2]

Affiliations + expand

PMID: 35890969 PMCID: PMC9322915 DOI: 10.3390/s22145289

Abstract

Sensors with a higher sampling rate produce higher-quality data. However, for more extended periods of data acquisition, as in the continuous monitoring of patients, the handling of the generated big data becomes increasingly complicated. This study aimed to determine the validity and reliability of low-sampling-frequency accelerometer (SENS) measurements in patients with knee osteoarthritis. Data were collected simultaneously using SENS and a previously validated sensor (Xsens) during two repetitions of overground walking. The processed acceleration signals were compared with respect to different coordinate axes to determine the test-retest reliability and the agreement between the two systems in the time and frequency domains. In total, 44 participants were included. With respect to different axes, the interclass correlation coefficient for the repeatability of SENS measurements was [0.93-0.96]. The concordance correlation coefficients for the two systems' agreement were [0.81-0.91] in the time domain and [0.43-0.99] in the frequency domain. The absolute biases estimated by the Bland-Altman method were [0.0005-0.008] in the time domain and [0-0.008] in the frequency domain. Low-sampling-frequency accelerometers can provide relatively valid data for measuring the gait accelerations in patients with knee osteoarthritis and can be used in the future for remote patient monitoring.

Source: https://pmc.ncbi.nlm.nih.gov/articles/PMC9322915/

Fibion

Fibion SENS Validity and Reliability – 2023 Study

- **SENS accurately measures physical activity and sedentary behavior in children and adolescents**, showing strong agreement with video observations and moderate to excellent reliability.

Eur J Pediatr. 2023 Aug;182(8):3639-3647. doi: 10.1007/s00431-023-05014-z. Epub 2023 Jun 1.

Validation of an accelerometer system for measuring physical activity and sedentary behavior in healthy children and adolescents

Camilla Milther [1], Lærke Winther [2], Michelle Stahlhut [3], Derek John Curtis [4], Mette Aadahl [3 5], Morten Tange Kristensen [5 6], Jette Led Sørensen [2 5], Christian Have Dall [5 6]

Affiliations + expand

PMID: 37258775 PMCID: PMC10460328 DOI: 10.1007/s00431-023-05014-z

Abstract

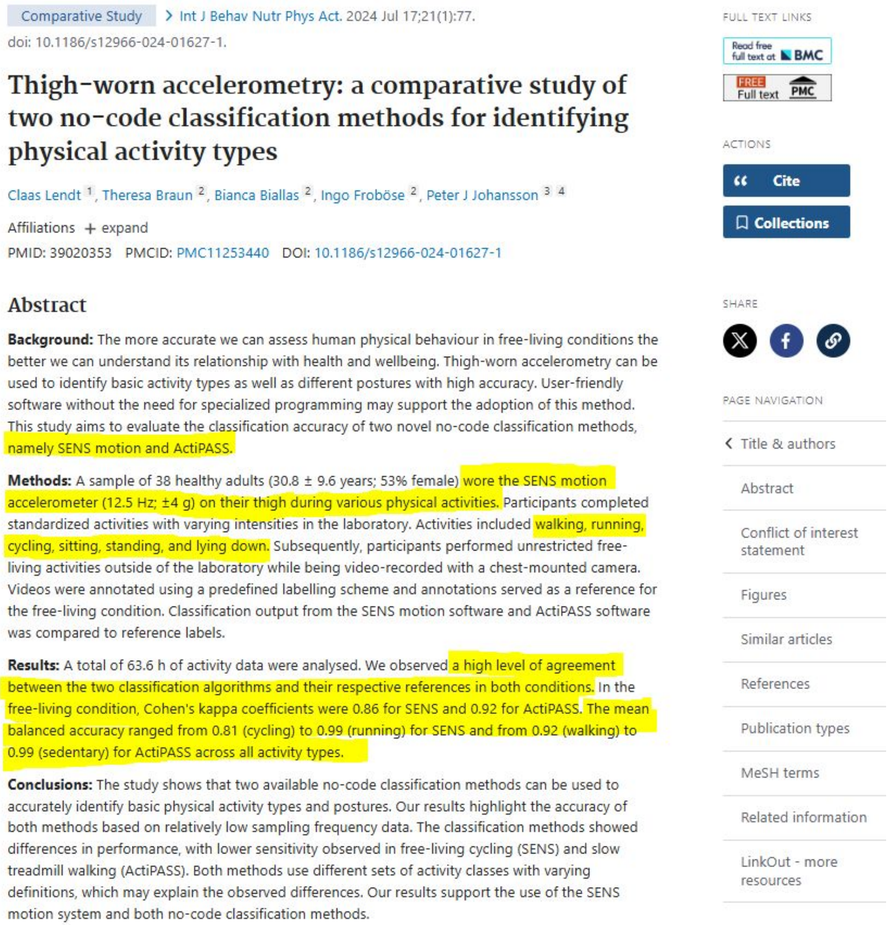
The study aims to assess the concurrent validity of the SENS motion® accelerometer system for device-based measurement of physical activity and sedentary behavior in healthy children and adolescents. Thirty-six healthy children and adolescents (mean ± standard deviation (SD) age, 10.2 ± 2.3 years) were fitted with three SENS sensors while performing standardized activities including walking, fast walking, sitting/lying, and arm movements. Data from the sensors were compared with video observations (reference criteria). The agreement between SENS motion® and observation was analyzed using Student's t-test and illustrated in Bland-Altman plots. The concurrent validity was further evaluated using intraclass correlation coefficient (ICC) and was expressed as standard error of measurement (SEM) and minimal detectable change (MDC). Strong agreement was found between SENS and observation for walking time, sedentary time, and lying time. In contrast, moderate agreement was observed for number of steps, sitting time, and time with and without arm movement. $ICC_{2,1}$ values were overall moderate to excellent (0.5-0.94), with correspondingly low SEM% for walking time, sedentary time, lying time, and time with arm movement (2-9%). An acceptable SEM% level was reached for both steps and sitting time (11% and 12%). For fast walking time, the results showed a weak agreement between the measurement methods, and the ICC value was poor.

Conclusion: SENS motion® seems valid for detecting physical activity and sedentary behavior in healthy children and adolescents with strong agreement and moderate to excellent ICC values. Furthermore, the explorative results on arm movements seem promising.

Source: https://pubmed.ncbi.nlm.nih.gov/37258775/

Fibion SENS Validity and Reliability – 2024 Study

- **SENS accurately identifies physical activity types and postures with high agreement in free-living conditions.**



Comparative Study > Int J Behav Nutr Phys Act. 2024 Jul 17;21(1):77.
doi: 10.1186/s12966-024-01627-1.

Thigh-worn accelerometry: a comparative study of two no-code classification methods for identifying physical activity types

Claas Lendt [1], Theresa Braun [2], Bianca Biallas [2], Ingo Froböse [2], Peter J Johansson [3 4]

Affiliations + expand

PMID: 39020353 PMCID: PMC11253440 DOI: 10.1186/s12966-024-01627-1

Abstract

Background: The more accurate we can assess human physical behaviour in free-living conditions the better we can understand its relationship with health and wellbeing. Thigh-worn accelerometry can be used to identify basic activity types as well as different postures with high accuracy. User-friendly software without the need for specialized programming may support the adoption of this method. This study aims to evaluate the classification accuracy of two novel no-code classification methods, namely SENS motion and ActiPASS.

Methods: A sample of 38 healthy adults (30.8 ± 9.6 years; 53% female) wore the SENS motion accelerometer (12.5 Hz; ±4 g) on their thigh during various physical activities. Participants completed standardized activities with varying intensities in the laboratory. Activities included walking, running, cycling, sitting, standing, and lying down. Subsequently, participants performed unrestricted free-living activities outside of the laboratory while being video-recorded with a chest-mounted camera. Videos were annotated using a predefined labelling scheme and annotations served as a reference for the free-living condition. Classification output from the SENS motion software and ActiPASS software was compared to reference labels.

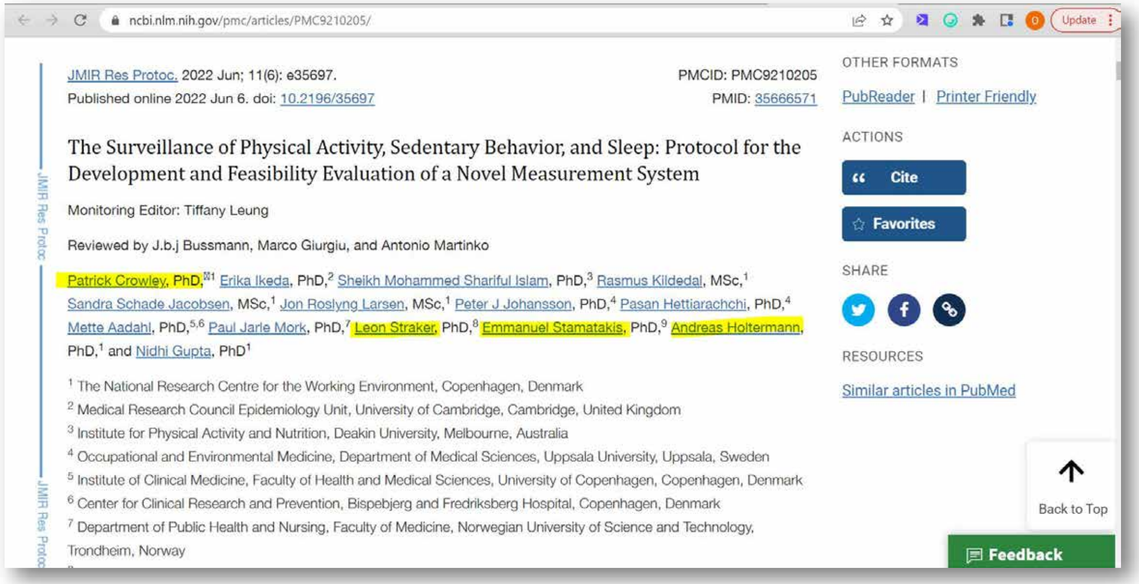
Results: A total of 63.6 h of activity data were analysed. We observed a high level of agreement between the two classification algorithms and their respective references in both conditions. In the free-living condition, Cohen's kappa coefficients were 0.86 for SENS and 0.92 for ActiPASS. The mean balanced accuracy ranged from 0.81 (cycling) to 0.99 (running) for SENS and from 0.92 (walking) to 0.99 (sedentary) for ActiPASS across all activity types.

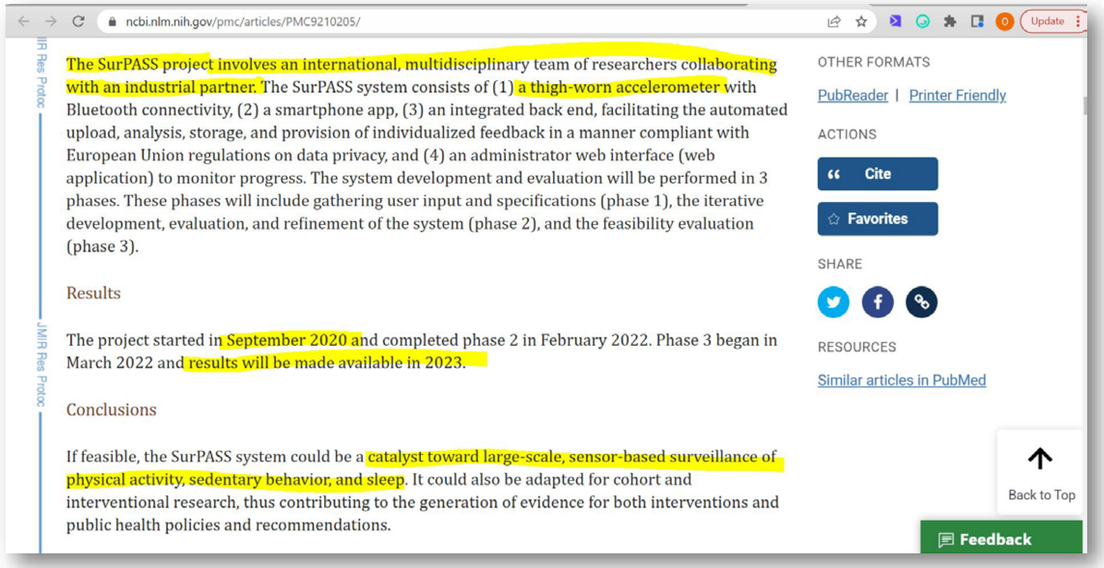
Conclusions: The study shows that two available no-code classification methods can be used to accurately identify basic physical activity types and postures. Our results highlight the accuracy of both methods based on relatively low sampling frequency data. The classification methods showed differences in performance, with lower sensitivity observed in free-living cycling (SENS) and slow treadmill walking (ActiPASS). Both methods use different sets of activity classes with varying definitions, which may explain the observed differences. Our results support the use of the SENS motion system and both no-code classification methods.

Source: https://pubmed.ncbi.nlm.nih.gov/39020353/

SurPASS: The National Surveillance of Physical Activity, Sedentary Behavior, and Sleep in Denmark

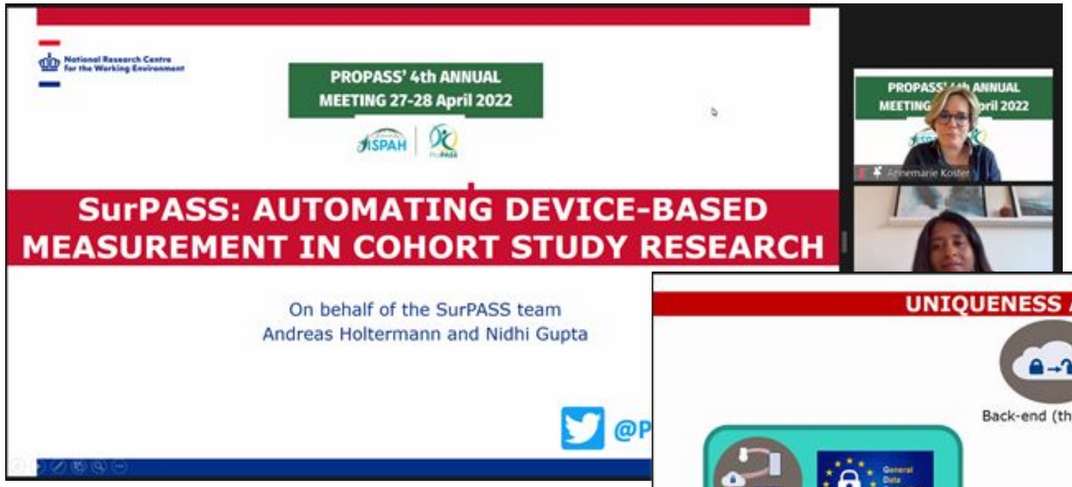
- **SENS has been part of the SurPASS project from September 2020.**
- Objective: to develop and assess the feasibility of a sensor-based system for monitoring physical activity, sedentary behavior, and sleep at a national level in Denmark with the potential to adapt it for cohort and interventional research in public health and policy.



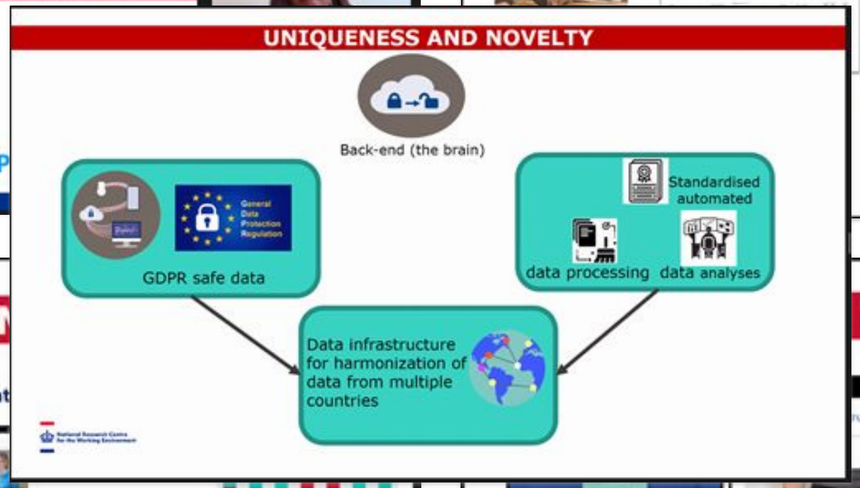


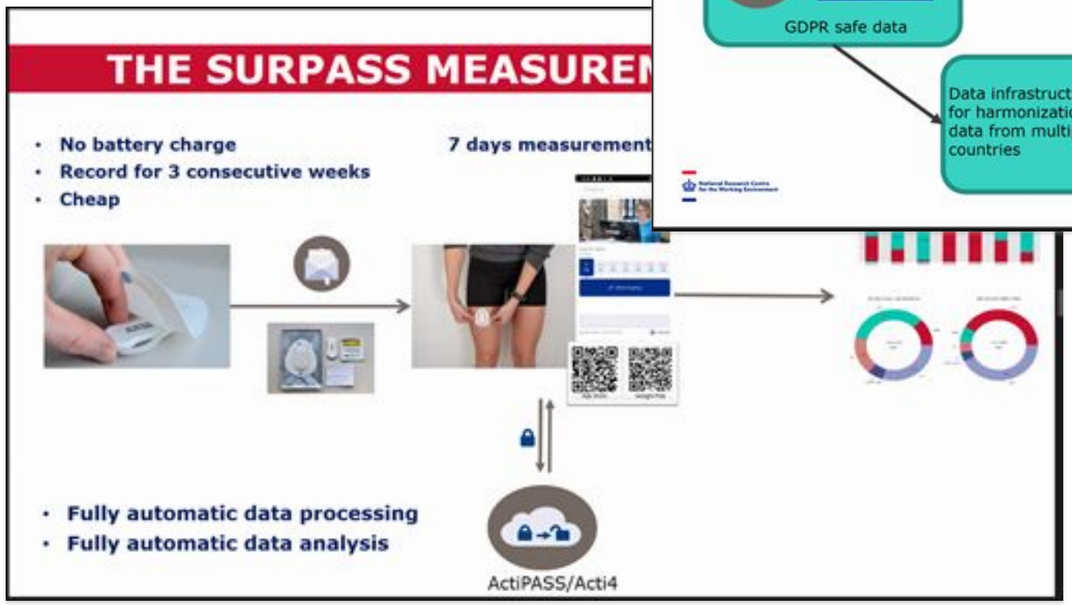
Source: https://pubmed.ncbi.nlm.nih.gov/35666571/

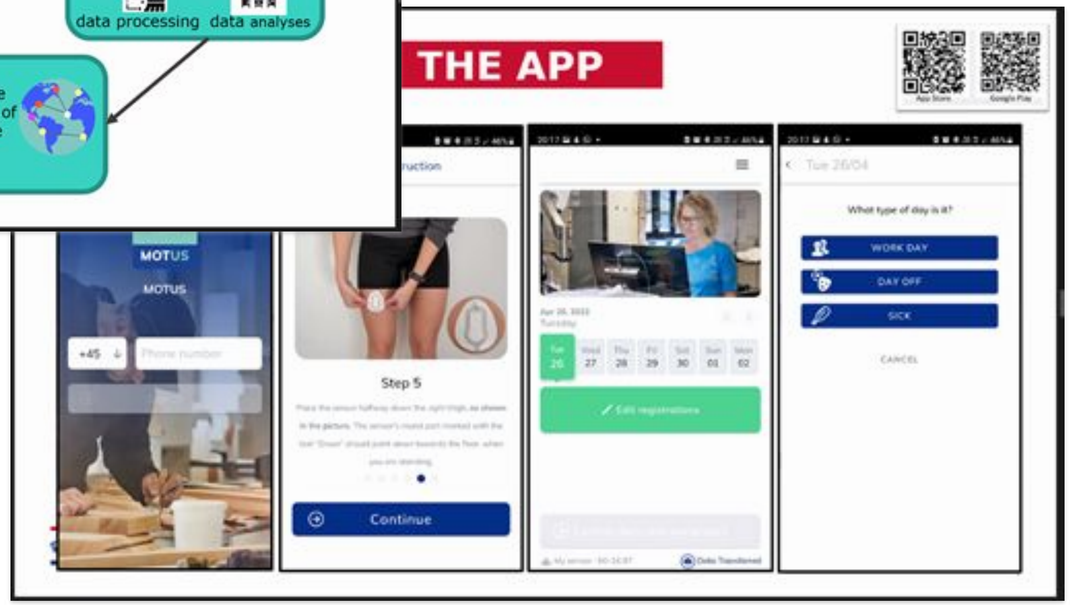
SurPASS


National Research Centre for the Working Environment
PROPASS' 4th ANNUAL MEETING 27-28 April 2022
SurPASS: AUTOMATING DEVICE-BASED MEASUREMENT IN COHORT STUDY RESEARCH
On behalf of the SurPASS team
Andreas Holtermann and Nidhi Gupta


THE SURPASS SYSTEM
The backend
The brain of system
The sensor
On participants body

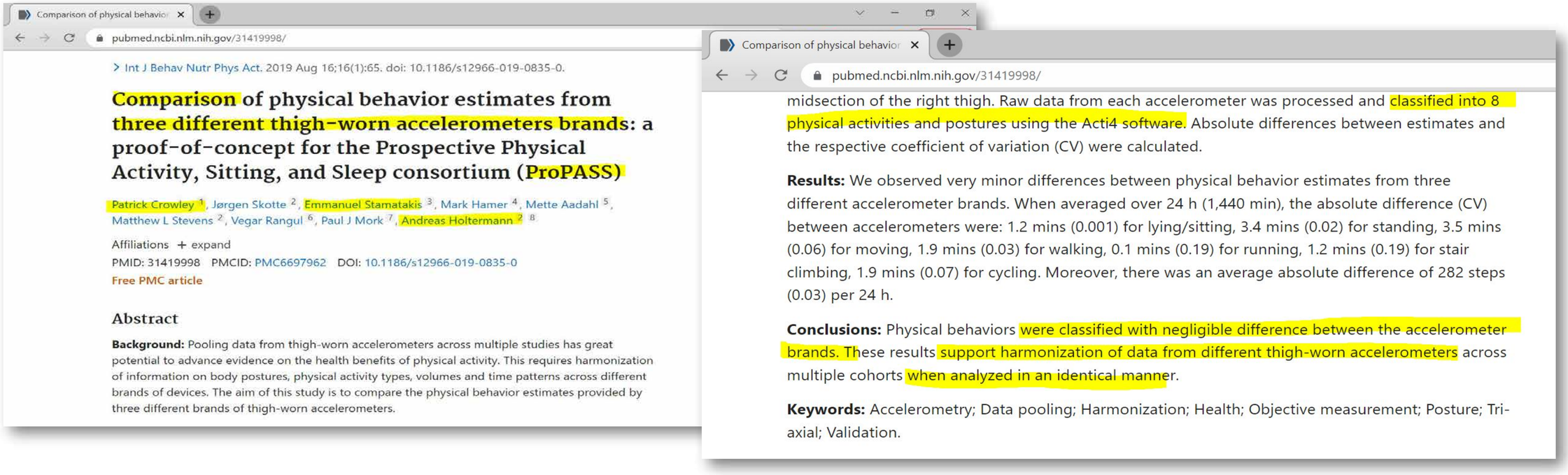

UNIQUENESS AND NOVELTY
Back-end (the brain)
GDPR safe data
Standardised automated
data processing
data analyses
Data infrastructure for harmonization of data from multiple countries


THE SURPASS MEASUREM
No battery charge
Record for 3 consecutive weeks
Cheap
7 days measurement
Fully automatic data processing
Fully automatic data analysis
ActiPASS/Acti4


THE APP
MOTUS
Step 5
Continue
What type of day is it?
WORK DAY
DAY OFF
SICK
CANCEL

Fibion SENS: Validity and Interchangeability with Research-Grade Accelerometers

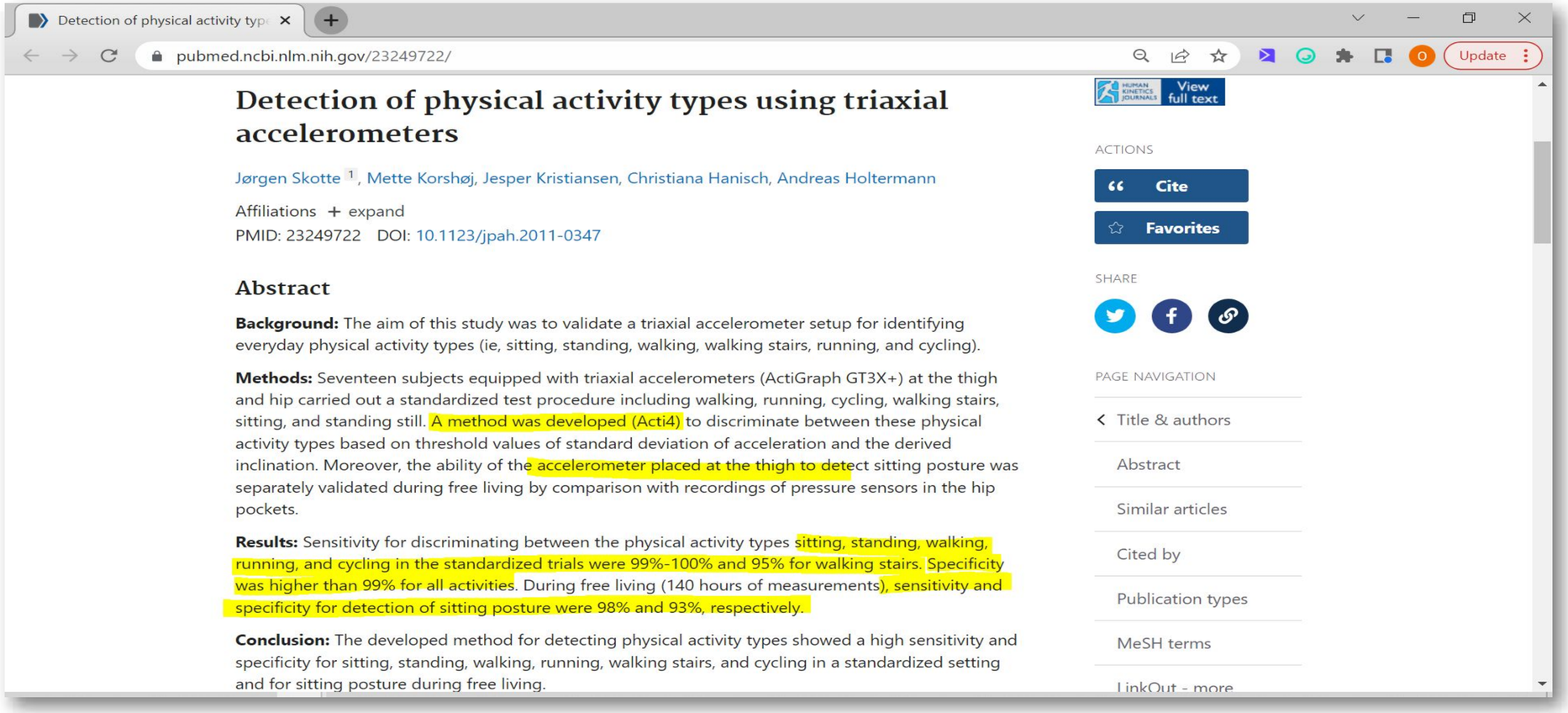
- Although SENS was not included in Crowley et al. (2019), the study suggests that it would produce similar results when analyzed using the same methodology.
- The study demonstrated that different thigh-worn accelerometers provide comparable data, supporting the idea that Fibion SENS aligns with this standard.
- Conclusion: **SENS can be used interchangeably with other thigh-worn accelerometers.**
  Note: Some of the authors are involved in the SurPASS project.



Source:
https://link.springer.com/article/10.1186/s12966-019-0835-0

ACTI4 Algorithms Integration

- **Validated methods in SENS**: validated methods from this study are being integrated into SENS cloud in collaboration with the authors of the publication, making them available for all users.



Source: https://pubmed.ncbi.nlm.nih.gov/23249722/

Validation and Ongoing Studies Using Fibion SENS*

Ongoing Validation Studies

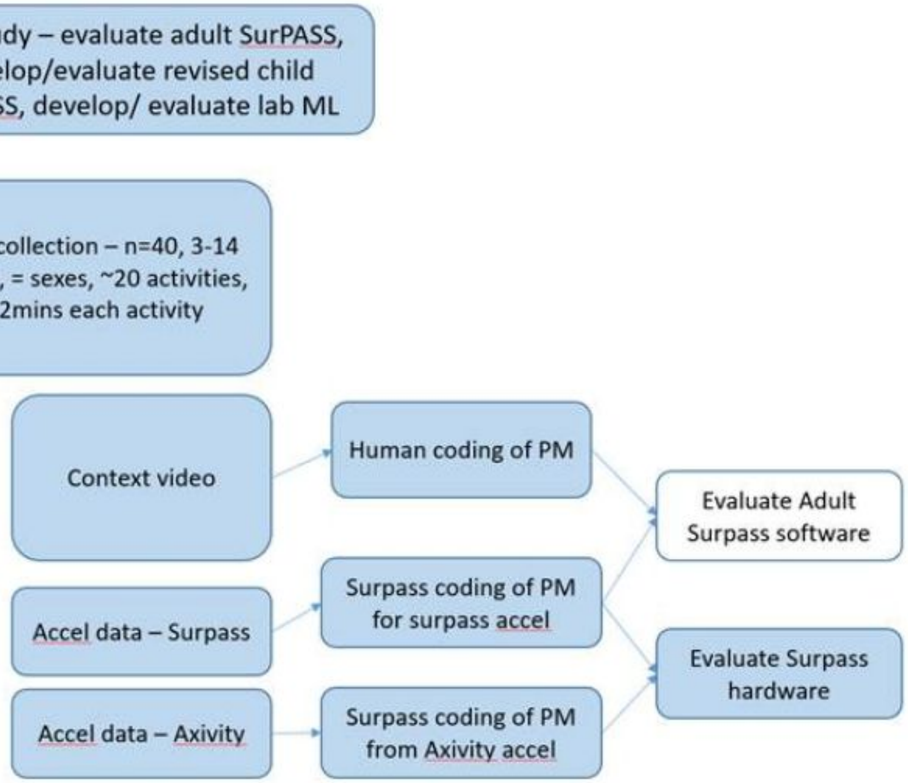
1. **University of Science and Technology, Norway** – Comparing Acti4 and SENS algorithms.
2. **Australia & Denmark collaboration** – Acti4 validation with 50–100 children (3–14 years), data collection ongoing.
3. **West Lake University, China** – Lab validation; ActiGraph vs. Fibion SENS in free-living conditions.
4. **Copenhagen Study** – Validating SENS algorithms in children (6–15 years) with video-based criteria.
5. **Karolinska Institute** – Study details in progress.

More Studies Using Fibion SENS

1. **Karolinska Institute, Sweden** – SB & PA assessment in 600 children and youth.
2. **Occupational Health Research Center, Finland** – Workplace SB study with 40 adults.
3. **Malmö University** – SB and mental health research in 200 adults.
4. **Karlstadt University** – SB & PA measurements with 40 SENS devices.
5. **Århus University, Denmark** – Psychiatric study with 520 children (age 11).

Validation and Ongoing Studies Using Fibion SENS**

1st study mentioned is done in Australia in a collaboration with NFA (Andreas Holtermann



Professor Leon Straker
John Curtin Distinguished Professor

School of Allied Health & enAble Institute
Faculty of Health Science
Curtin University

fibion

Summary of Validity and Reliability

1. SENS device has been shown to have better validity and relative reliability than ActivPAL (Pedersen et al. 2022)

2. SENS provides raw data (12.5 Hz), so any algorithms for thigh-worn accelerometry can be used (validated Acti4 integrated to cloud)

3. SENS shows strong validity in children and adolescents (Milther et al. 2023).

4. SENS reliably measures gait in knee osteoarthritis patients (Ghaffari et al. 2022).

5. SENS accurately classifies activity types and postures in free-living conditions (Lendt et al. 2024).

6. Studies show raw data identical between brands (Crowley et al. 2019): always safe bet as raw data always accessible

   Several ongoing high-profile projects using SENS as their primary measurement

7.

Testimonial

“Large amount of high-quality data is crucial for successful research. Fibion SENS Motion provides unique features that makes data collection, analyses, harmonization and feedback to participants easier - and with less burden – both for participants and researchers.”

Professor Andreas Holtermann, MSO, MSc, PhD

The National Research Centre for the Working Environment, Copenhagen, Denmark

Working group member at ProPASS

Project Management with Fibion SENS Made Easy

Key features that make data collection, analysis and reporting easier and faster:

1. **Pre-charged devices** – Ready to use out of the box, no charging needed.
2. **Over 22 weeks of measurement time** – Long battery life for extended studies.
3. **Remote control** – Adjust settings and manage devices remotely.
4. **Automatic data upload** – Data is uploaded without manual intervention.
5. **Remote access from anywhere** – Monitor participants and access data online.
6. **GDPR compliant** – Ensures secure and privacy-compliant data handling.
7. **Automatically calculated variables** – Saves time by processing raw data automatically.
8. **Automatic participant reports** – Generates reports for easy data interpretation.

FIBION SENS

"Impressive Overall Performance Coupled With Unrivalled Ease Of Use."

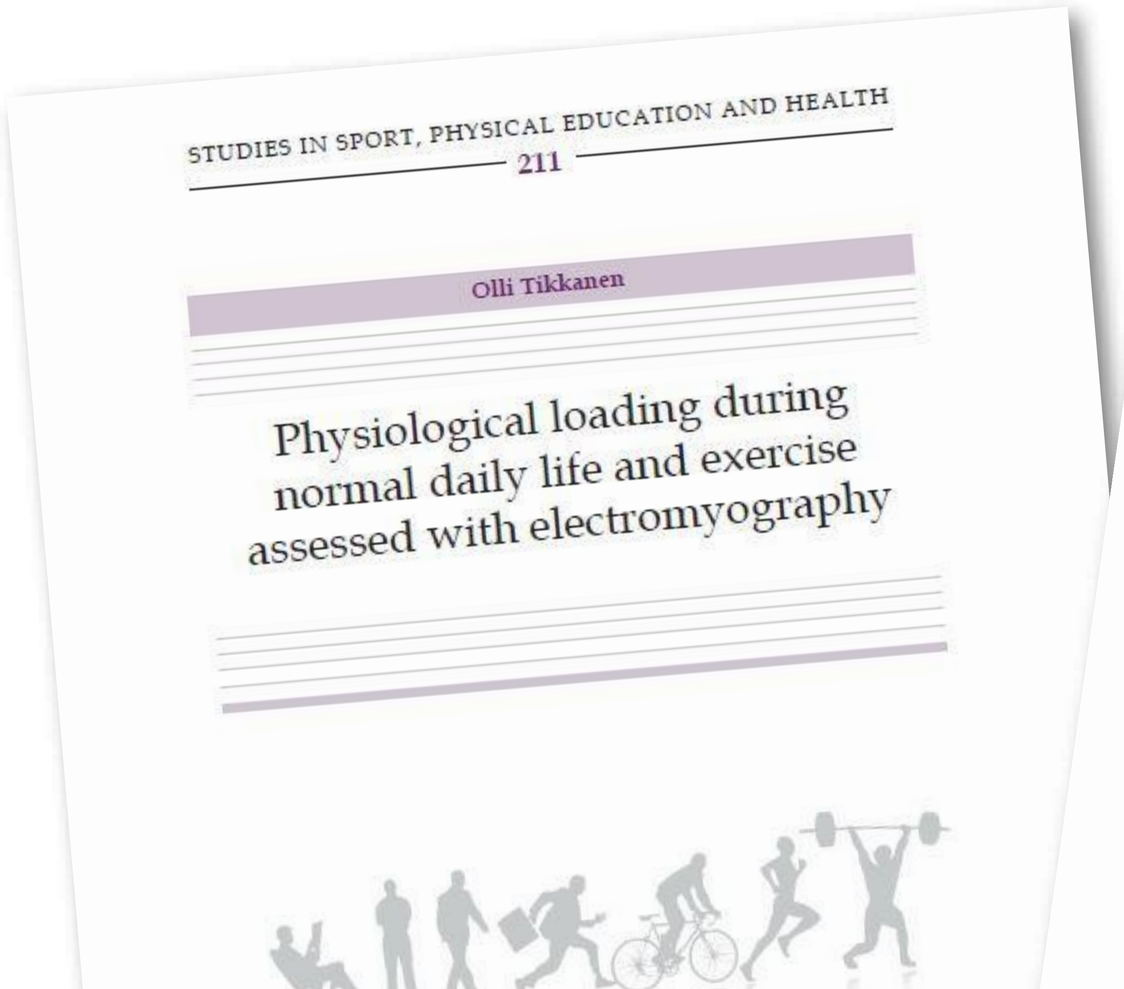
The Beginning

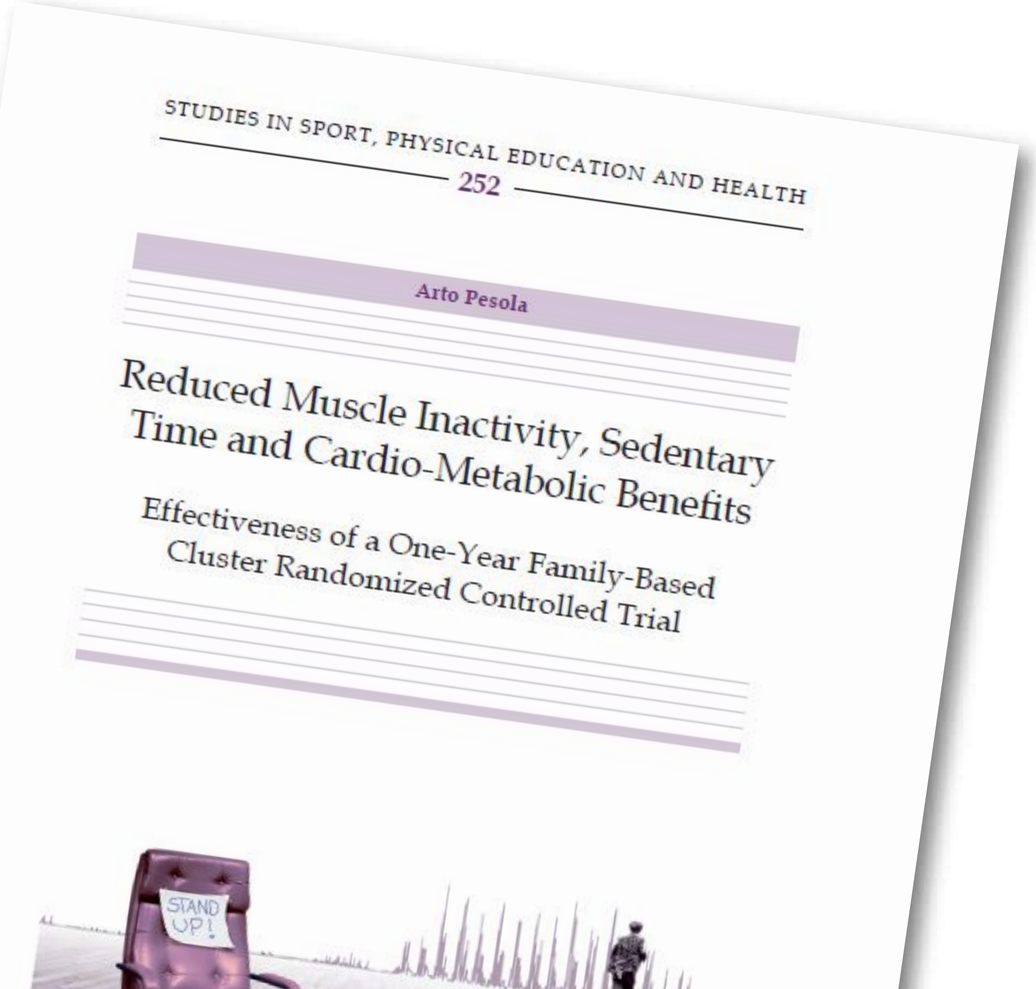
- University spin-off
- Fibion was established 2014

UNIVERSITY OF JYVÄSKYLÄ

Olli Tikkanen

Arto Pesola





Fibion

Fibion Product Development Team

Olli Tikkanen, PhD in Sport Sciences

Arto Pesola, PhD in Exercise Physiology

Tommo Reti, DSc in Internet Media Technology and Business

Peer Production

Specialists who have a broad knowledge of their respective fields and various talents share these qualities with each other and create something new together.

Ari Peltoniemi, MSc in Computer Sciences and Information Systems

Marko Havu, Biomedical Engineer, MSc Biomechanics, PhD candidate in Neuroscience and Biomedical Engineering

Fibion


Fibion
web.fibion.com

Features that Make Data Collection a Breeze

The simplest way to get data remotely.

Participant only need to attach the device (no tech skills needed).

Wearable Device

- Stick-and-Play patch
- Lightweight and waterproof
- Over 5 months 24/7 measurement time
- Over 2 years of standby time
- Automatic data transmission
- Hotspot upload™

Accurate Data

- XYZ acceleration data
- Analysed sitting time, activity types and intensity
- Real-time remote data
- 2 weeks of data logging

Smart Management

- Data management platform
- Cloud server
- Smartphone app
- Manage all sensors remotely
- Fibion online and PDF participant reports

Fibion

Disposable Patch

- The patch should be replaced after 14 days
- The patch typically loosens itself after 10-17 days.
- If redness or irritation occurs during use, remove the patch immediately
- 3M, Medical approved, ISO 10993-10

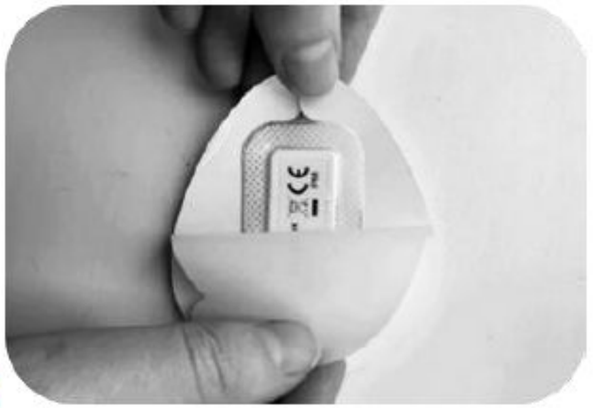
Fibion

Attaching the Patch and Device

1

Clean the skin where the patch is meant to be placed.

2



Remove the back side.

3

Place the patch on the outer side of the thigh.

4

Remove the white edge.

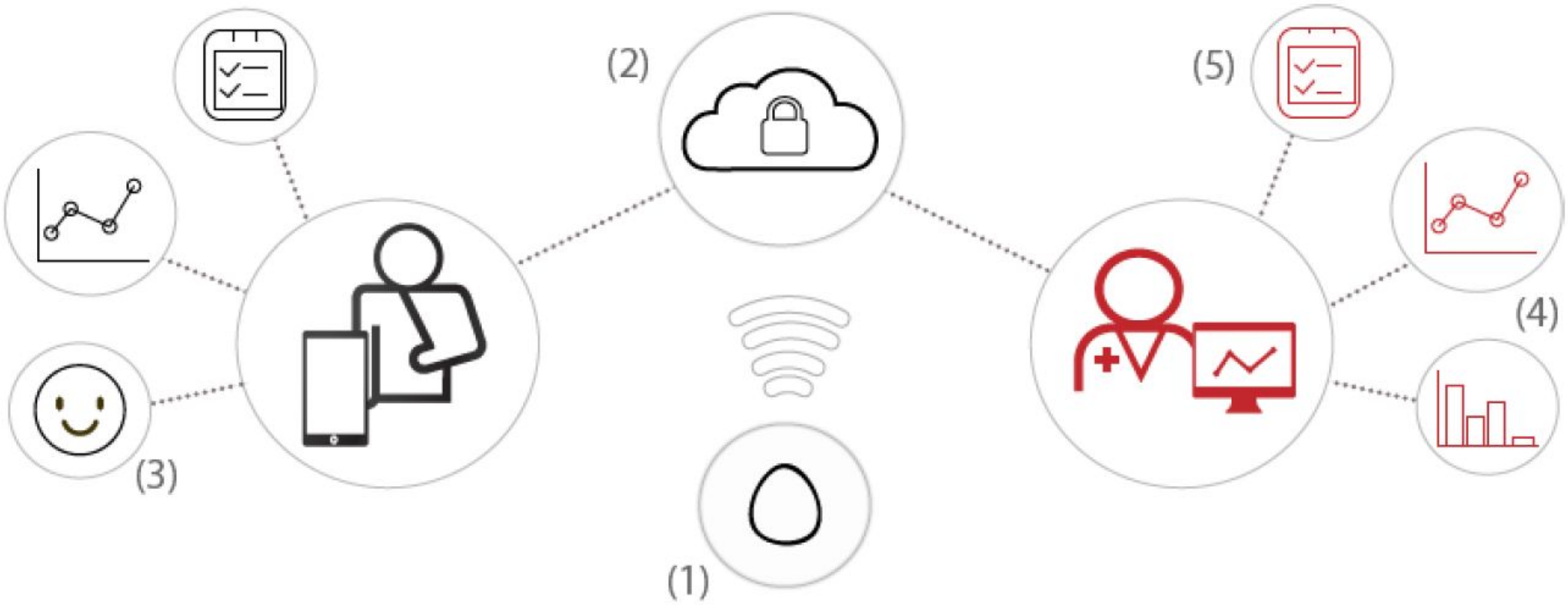
Fibion

New innovations

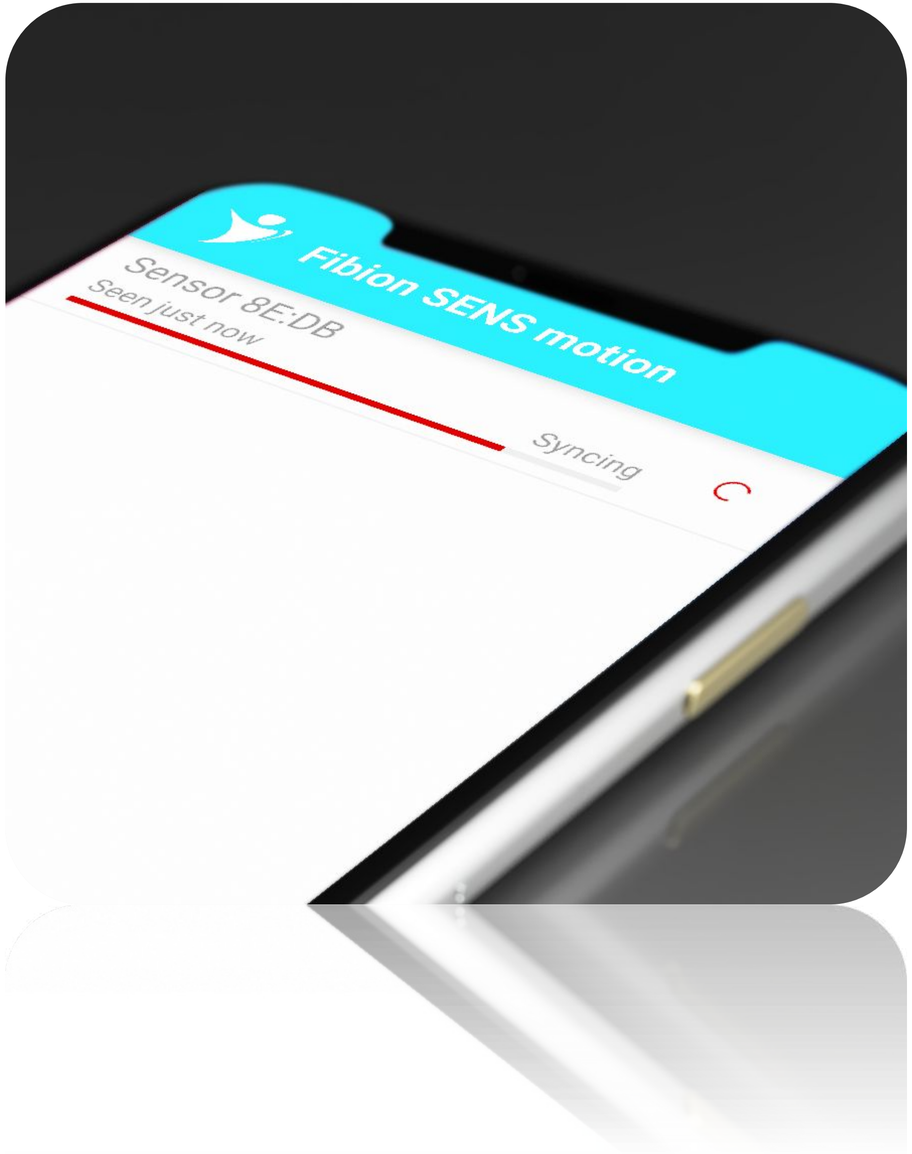
With our revolutionary Data-Management-as-a-Service (D-MAS™) and Hotspot Upload™ you can concentrate making world class research as you don't need to worry about GDPR regulations, sensor charging, data downloads, data storage, data backups, participant feedback reports etc.

Fibion

System Architecture



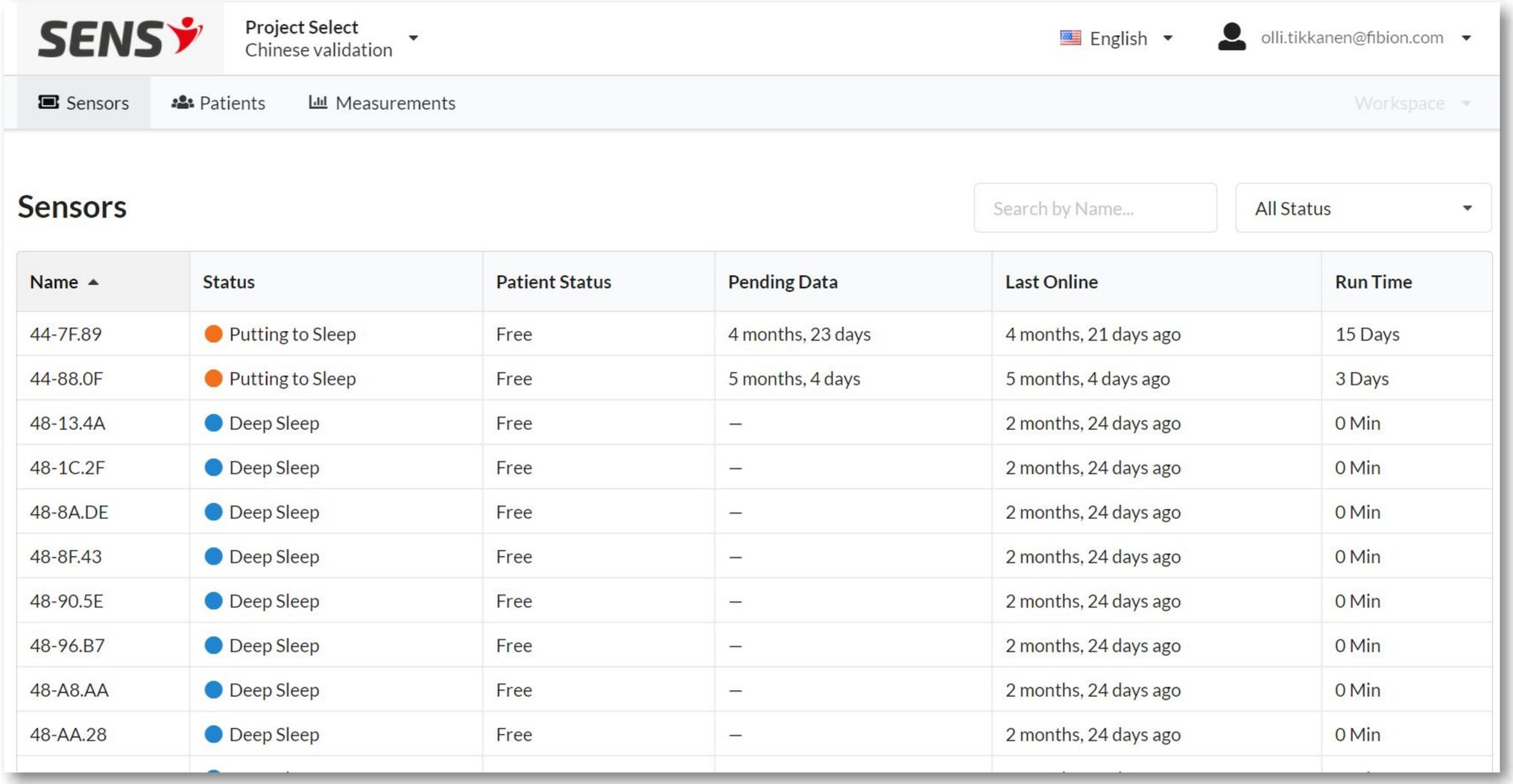
Smartphone App



1. iOS and Android
2. Bluetooth
3. Andoid: automatic data upload
4. iOS: need to tap to allow

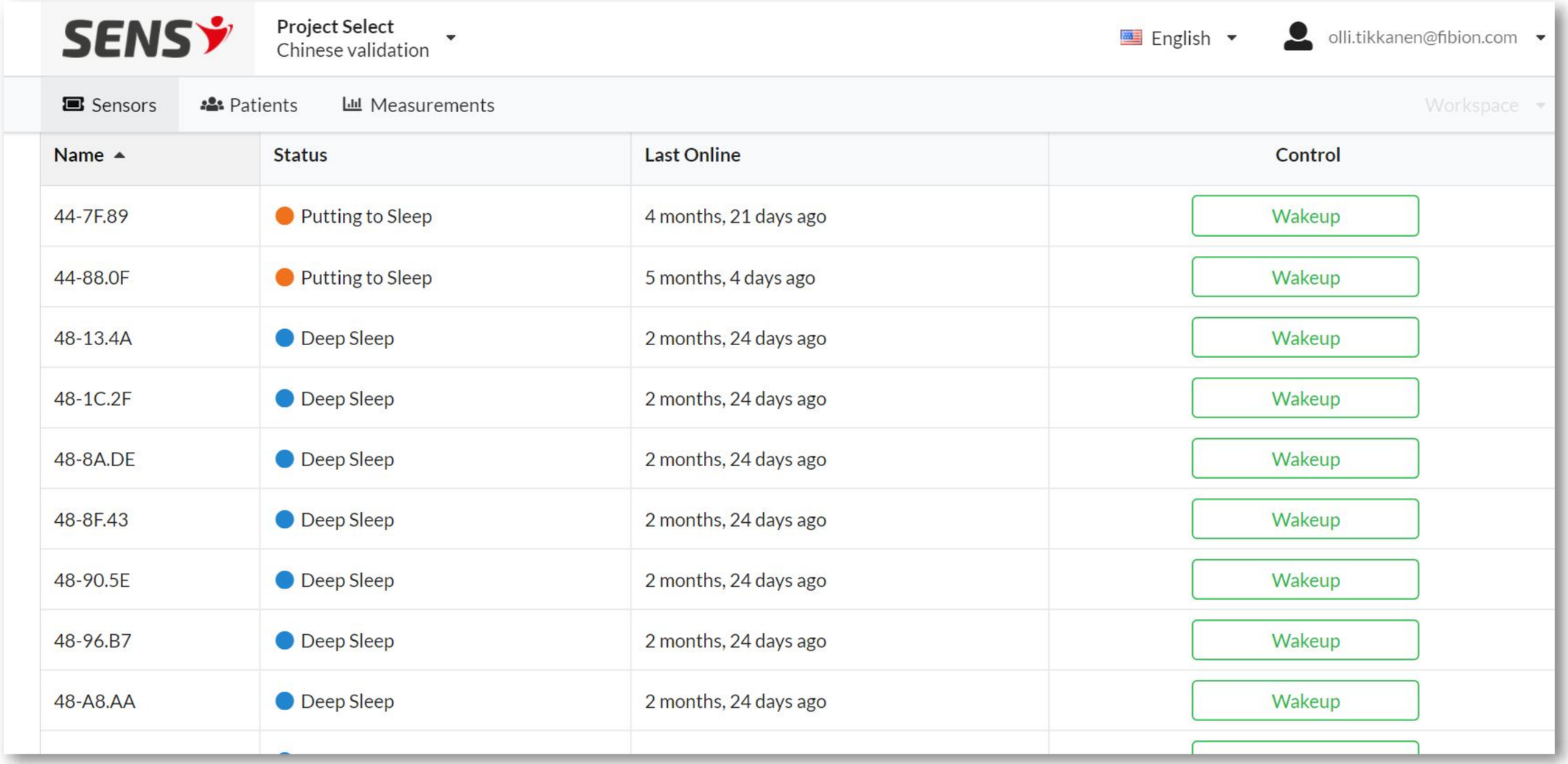
Fibion

Web Portal



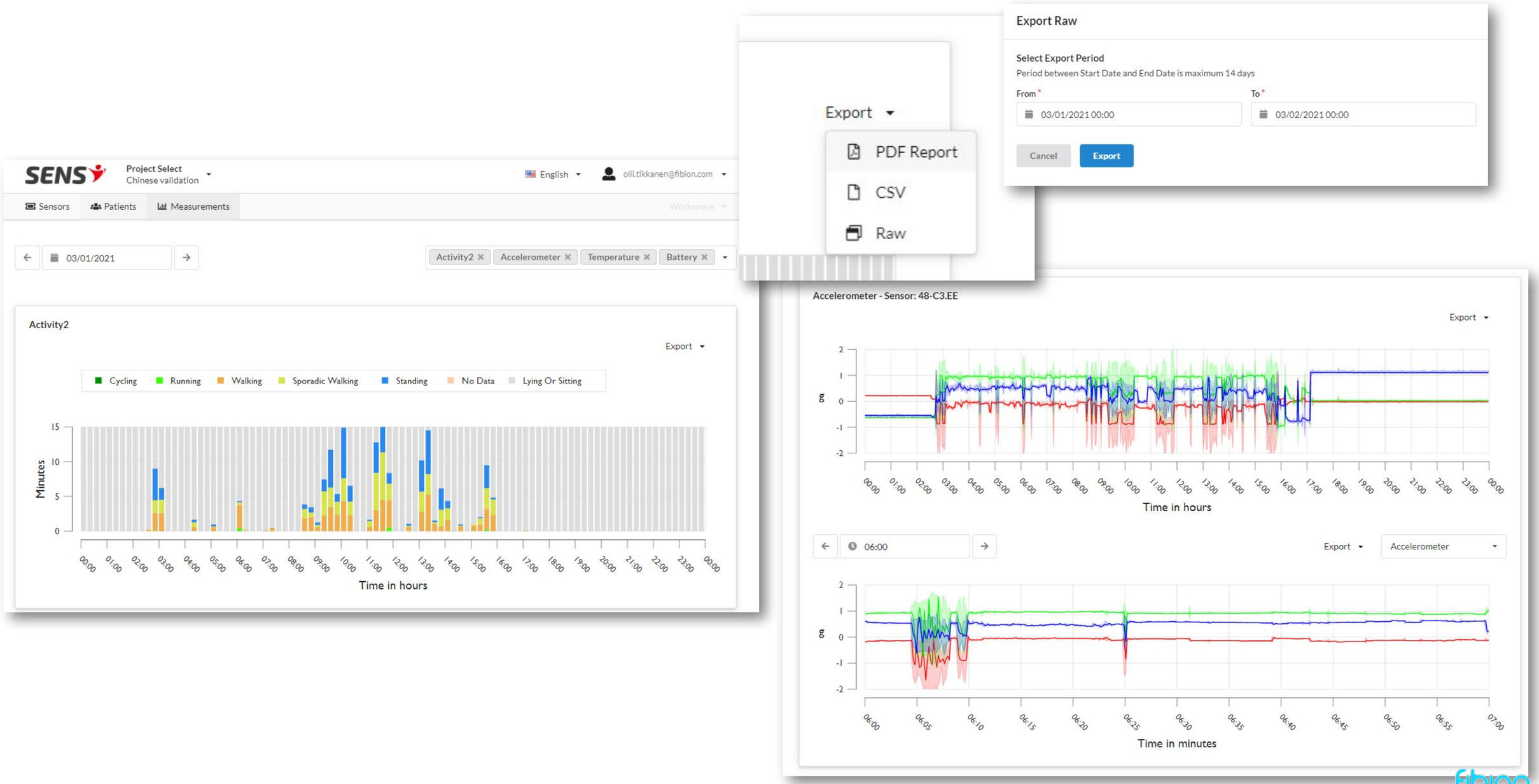
Name ▲	Status	Patient Status	Pending Data	Last Online	Run Time
44-7F.89	Putting to Sleep	Free	4 months, 23 days	4 months, 21 days ago	15 Days
44-88.0F	Putting to Sleep	Free	5 months, 4 days	5 months, 4 days ago	3 Days
48-13.4A	Deep Sleep	Free	–	2 months, 24 days ago	0 Min
48-1C.2F	Deep Sleep	Free	–	2 months, 24 days ago	0 Min
48-8A.DE	Deep Sleep	Free	–	2 months, 24 days ago	0 Min
48-8F.43	Deep Sleep	Free	–	2 months, 24 days ago	0 Min
48-90.5E	Deep Sleep	Free	–	2 months, 24 days ago	0 Min
48-96.B7	Deep Sleep	Free	–	2 months, 24 days ago	0 Min
48-A8.AA	Deep Sleep	Free	–	2 months, 24 days ago	0 Min
48-AA.28	Deep Sleep	Free	–	2 months, 24 days ago	0 Min

Remote Control



Name	Status	Last Online	Control
44-7F.89	Putting to Sleep	4 months, 21 days ago	Wakeup
44-88.0F	Putting to Sleep	5 months, 4 days ago	Wakeup
48-13.4A	Deep Sleep	2 months, 24 days ago	Wakeup
48-1C.2F	Deep Sleep	2 months, 24 days ago	Wakeup
48-8A.DE	Deep Sleep	2 months, 24 days ago	Wakeup
48-8F.43	Deep Sleep	2 months, 24 days ago	Wakeup
48-90.5E	Deep Sleep	2 months, 24 days ago	Wakeup
48-96.B7	Deep Sleep	2 months, 24 days ago	Wakeup
48-A8.AA	Deep Sleep	2 months, 24 days ago	Wakeup

Web Portal


SENS
Project Select
Chinese validation
English
olli.tikkanen@fibion.com
Sensors
Patients
Measurements
Workspace
03/01/2021
Activity2
Accelerometer
Temperature
Battery
Activity2
Export
Cycling
Running
Walking
Sporadic Walking
Standing
No Data
Lying Or Sitting
Minutes
Time in hours
Export
PDF Report
CSV
Raw
Export Raw
Select Export Period
Period between Start Date and End Date is maximum 14 days
From *
03/01/2021 00:00
To *
03/02/2021 00:00
Cancel
Export
Accelerometer - Sensor: 48-C3.EE
Export
g
Time in hours
06:00
Export
Accelerometer
g
Time in minutes

Participant Feedback Reports

1. Automatically produced reports
   a. PDF text report
   b. Interactive online report

2. Can be shared as a simple web link

3. Interactive goal setting tools

4. Different language options

5. Group reports can be created easily

6. API available

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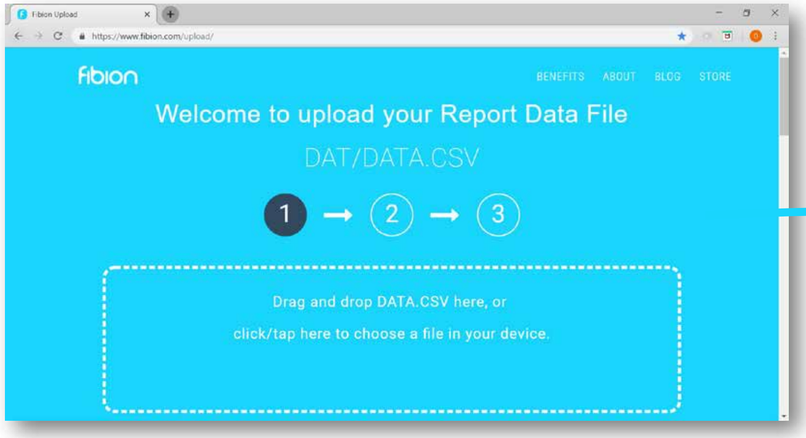
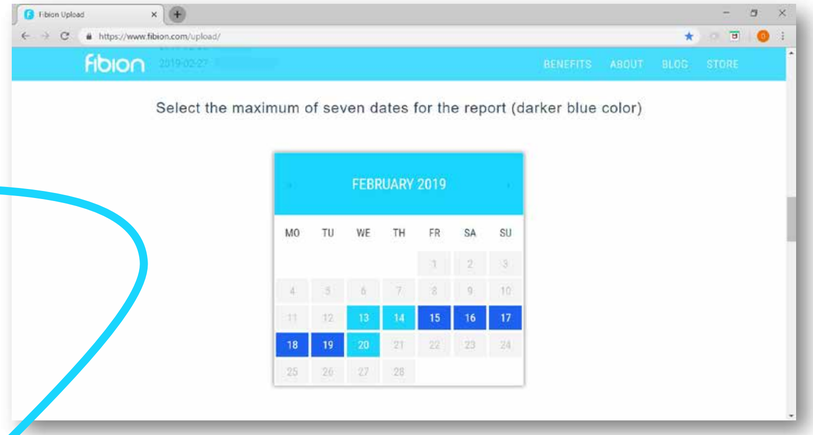
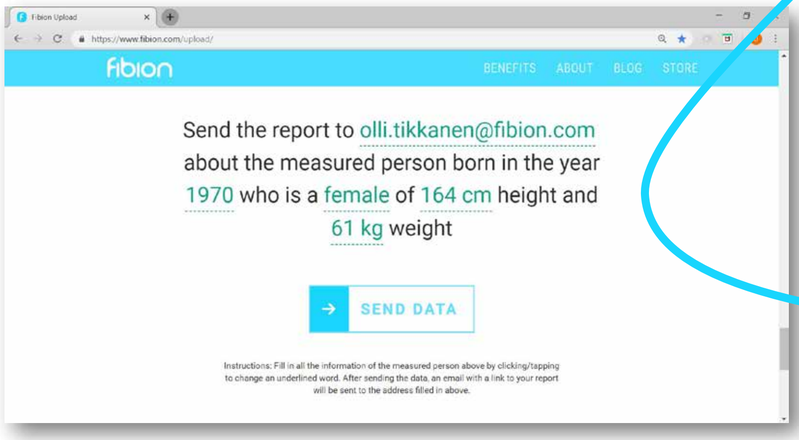
Report Creation and Examples

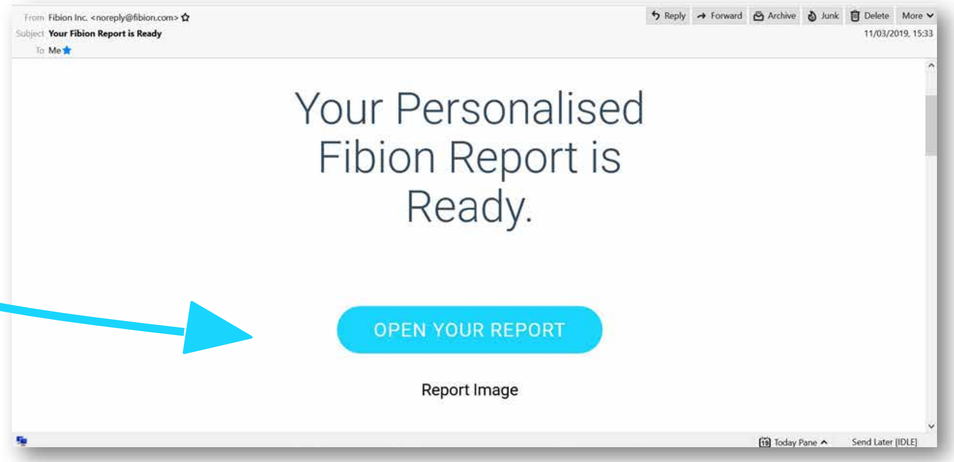


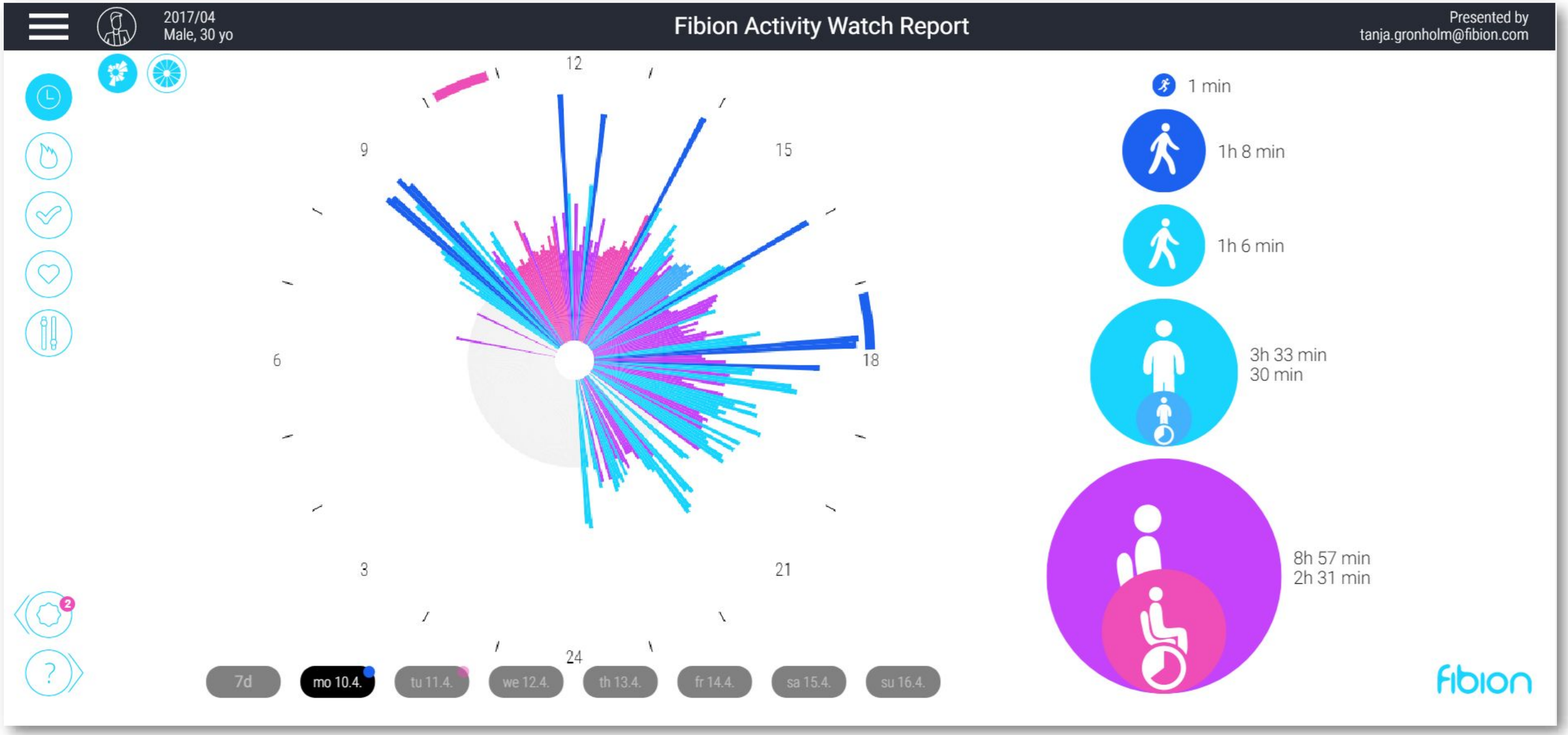


https://www.fibion.com/upload/

Fibion code: rnd6845







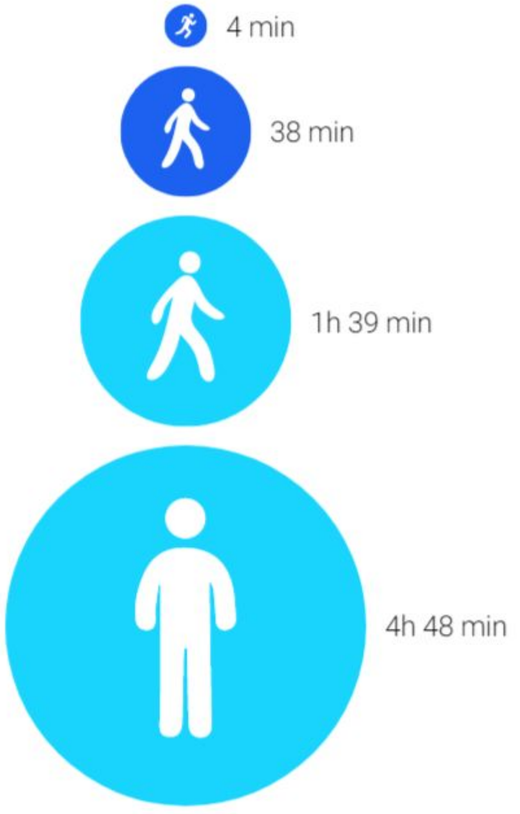
Example (in Swedish): https://beta.fibion.com/report/fd99tG73UJFG/sv

2017/04
Male, 30 yo

kcal kJ

Fibion Activity Energy Report

Presented by
tanja.gronholm@fibion.com

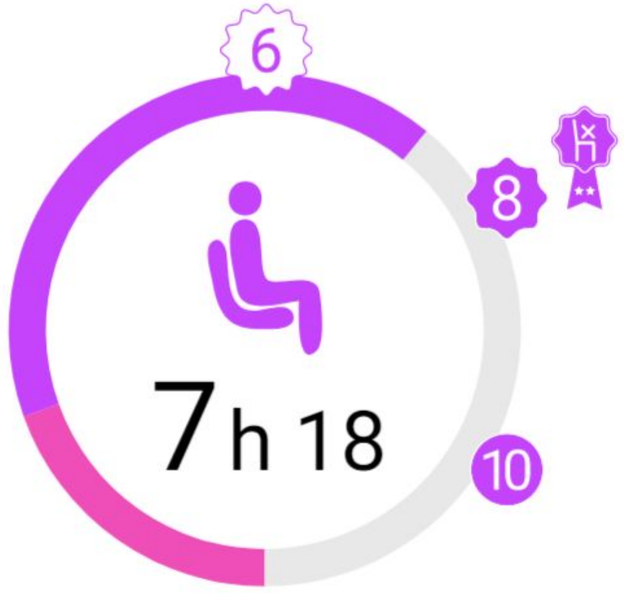


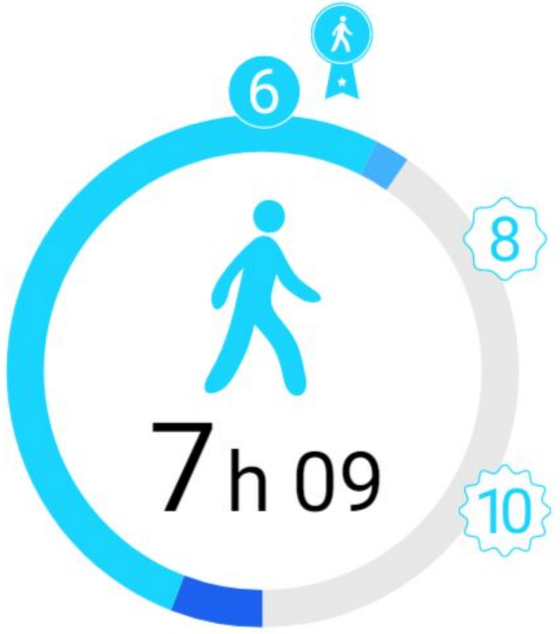
fibion

2017/04
Male, 30 yo

Fibion Activity Recommendation Report

Presented by
tanja.gronholm@fibion.com





3.4 x

0.4 x

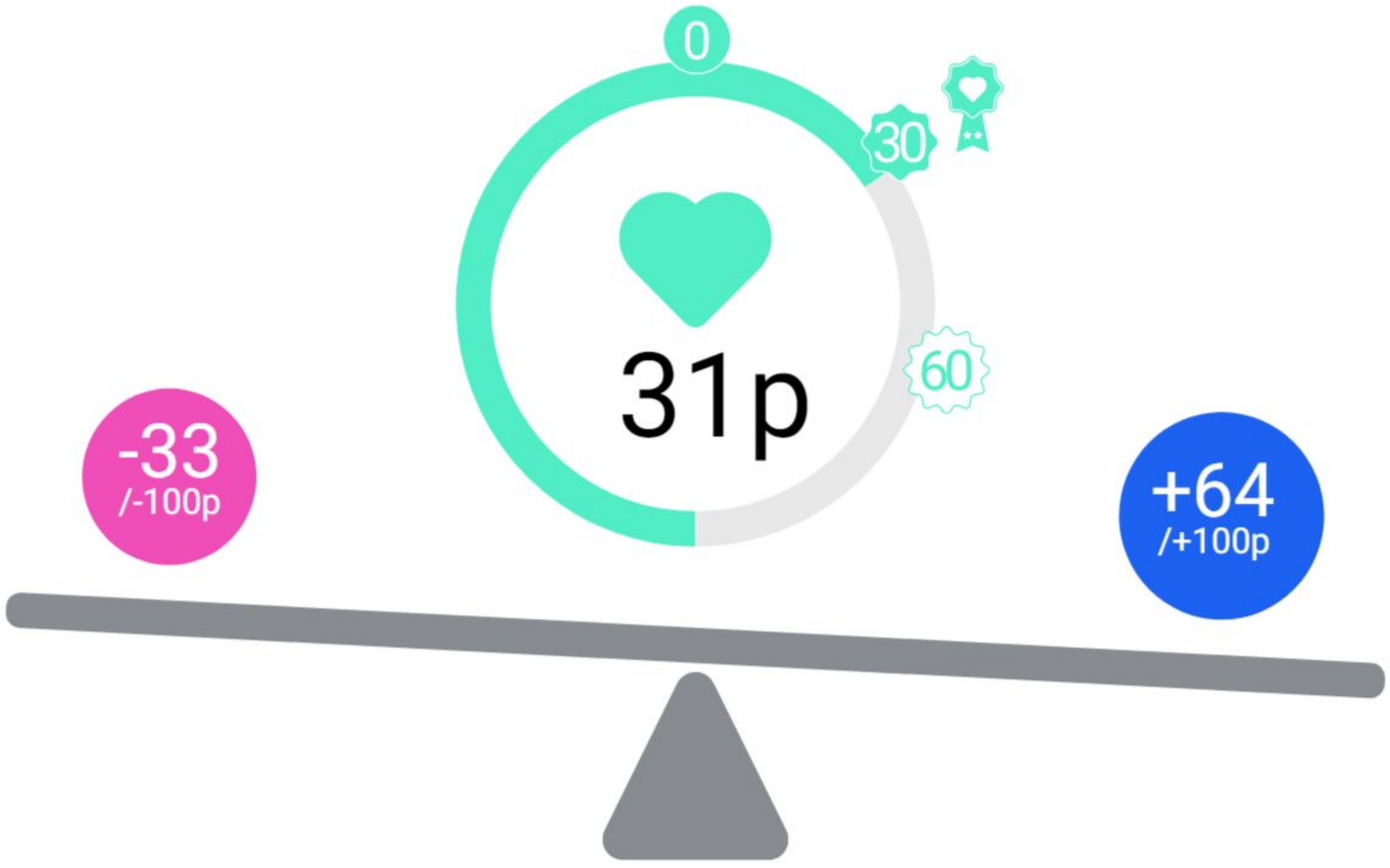
42 min

Fibion

2017/04
Male, 30 yo

Fibion Activity Health Report

Presented by
tanja.gronholm@fibion.com



Fibion

2017/04
Male, 30 yo

Fibion Activity Goal Report

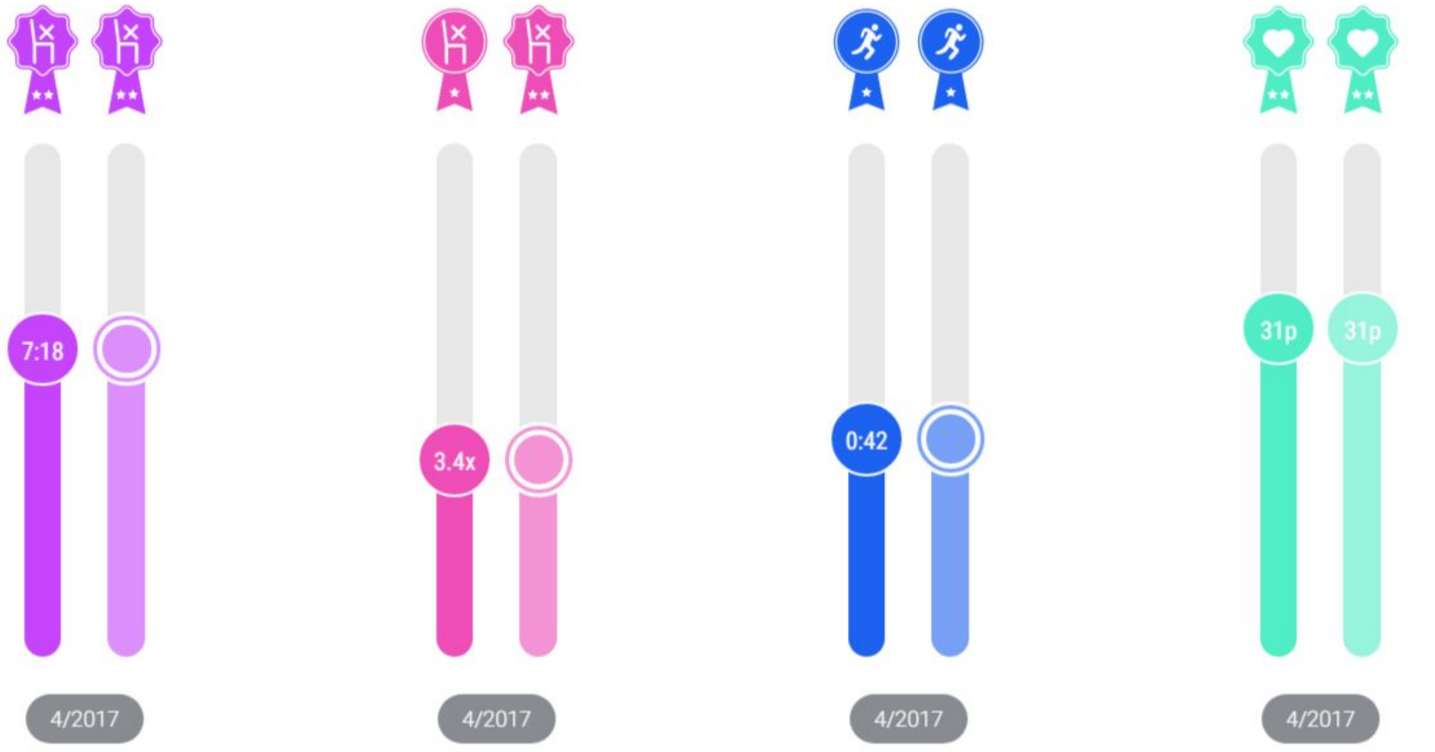
Presented by
tanja.gronholm@fibion.com

7:20h
7:18h ↗

3x
3.4x →

0:42h
0:42h →

31p
31p →



fibion

Fibion GOAL REPORT

11/2016 Male, 35 yo

Presented by olli.tikkanen@fibion.com

7:05h
8:29h ↘

2x
5.8x ↘

1:40h
2:07h ↘

MY GOALS

You set a goal to **reduce sitting time by 1h 24 min per day**. You used to sit 8h 28 min per day and your goal is to sit 7h 5 min per day.

You set a goal to **reduce the number of long sitting periods**. On average, you had 5.8 long sitting periods per day and your goal is 2 long sitting periods per day.

You set a goal to **reduce the duration of moderate-to-vigorous activity.**. On average, you had 2h 7 min moderate-to-vigorous activity per day and your goal is 1h 40 min moderate-to-vigorous atcivity per day.

Your goal sitting and moderate-to-vigorous activity **increases your Fibion Points by 23 points**. You had 45 Fibion Points per day and your goal is 68 Fibion Points per day.

MY ACTIONS

Fibion

FIBION MÅLSÄTTNINGSVERKTYG

4/2017 Man, 30 år

Fibion-rapport presenteras av tanja.gronholm@fibion.com

5:50h

7:19h ↘

2x

3.4x ↘

0:59h

0:42h ↗

MINA MÅL

Du ställde ett mål att **minska tiden du sitter med1h 29 min per dag/. Du brukade sitta 7h 18 min per dag och ditt mål är att sitta 5h 50 min per dag**

Du ställde ett mål att **minska antalet långa perioder av sittande**. I medeltal, hade du 3.4 långa perioder av sittande per dag och ditt mål är 2 långa perioder av sittande per dag.

Du ställde ett mål att **öka varaktigheten av medel till högintensiv aktivitet./. I medeltal, hade du 42 min medel- till högintensiv aktivitet per dag och ditt mål är 59 min medel- till högintensiv aktivitet per dag.**

Ditt mål för sittande och medel- till högintensiv aktivitet **ökar dina Fibion-poäng med 30 poäng**. Du hade 31 Fibion-poäng per dag och ditt mål är 61 Fibionpoäng per dag.

MINA ÅTGÄRDER


fibion
10/2017 HENKILÖKOHTAINEN ISTUMIS- JA AKTIIVISUUSANALYYSI
RAPORTTI
SUUSKELLO
YHTEENVETO
ISTUMINEN
AKTIIVISUUS
UOSITUKSET
AKTIIVISUUSTASAPAINO
HENKILÖKOHTAISET SUOSITUKSET
TOIMENPITEENI

Data Exports: Activity Data and XYZ Data

```
utc, local, unixts, general/nodata/time, activity/lying+sitting/time, activity/upright_stand/time, activity/upright_sporadic_walk/time, activity/upright_walk/time,
2021-02-22T22:00:00.000000Z, 2021-02-22T23:00:00.000000+01:00, 1614031200000, 60.00, 0.00, 0.00, 0.00, 0.00, 0.00, 0.00, 0.00, 0.00, 0.00
2021-02-22T23:00:00.000000Z, 2021-02-23T00:00:00.000000+01:00, 1614034800000, 60.00, 0.00, 0.00, 0.00, 0.00, 0.00, 0.00, 0.00, 0.00, 0.00
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2021-02-23T01:00:00.000000Z, 2021-02-23T02:00:00.000000+01:00, 1614042000000, 60.00, 0.00, 0.00, 0.00, 0.00, 0.00, 0.00, 0.00, 0.00, 0.00
2021-02-23T02:00:00.000000Z, 2021-02-23T03:00:00.000000+01:00, 1614045600000, 60.00, 0.00, 0.00, 0.00, 0.00, 0.00, 0.00, 0.00, 0.00, 0.00
2021-02-23T03:00:00.000000Z, 2021-02-23T04:00:00.000000+01:00, 1614049200000, 60.00, 0.00, 0.00, 0.00, 0.00, 0.00, 0.00, 0.00, 0.00, 0.00
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2021-02-23T08:00:00.000000Z, 2021-02-23T09:00:00.000000+01:00, 1614067200000, 60.00, 0.00, 0.00, 0.00, 0.00, 0.00, 0.00, 0.00, 0.00, 0.00
2021-02-23T09:00:00.000000Z, 2021-02-23T10:00:00.000000+01:00, 1614070800000, 60.00, 0.00, 0.00, 0.00, 0.00, 0.00, 0.00, 0.00, 0.00, 0.00
2021-02-23T10:00:00.000000Z, 2021-02-23T11:00:00.000000+01:00, 161
2021-02-23T11:00:00.000000Z, 2021-02-23T12:00:00.000000+01:00, 161
2021-02-23T12:00:00.000000Z, 2021-02-23T13:00:00.000000+01:00, 161
2021-02-23T13:00:00.000000Z, 2021-02-23T14:00:00.000000+01:00, 161
2021-02-23T14:00:00.000000Z, 2021-02-23T15:00:00.000000+01:00, 161
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	A	B	C	D	E	F
1	utc	local	unixts	x	y	z
2	2021-02-08T22:00:00.025000Z	2021-02-08T23:00:00.025000+01:00	1.61282E+12	-0.352	-0.216	-0.672
3	2021-02-08T22:00:00.117000Z	2021-02-08T23:00:00.117000+01:00	1.61282E+12	-0.352	-0.216	-0.672
4	2021-02-08T22:00:00.209000Z	2021-02-08T23:00:00.209000+01:00	1.61282E+12	-0.352	-0.216	-0.672
5	2021-02-08T22:00:00.301000Z	2021-02-08T23:00:00.301000+01:00	1.61282E+12	-0.352	-0.216	-0.672
6	2021-02-08T22:00:00.394000Z	2021-02-08T23:00:00.394000+01:00	1.61282E+12	-0.352	-0.216	-0.672
7	2021-02-08T22:00:00.486000Z	2021-02-08T23:00:00.486000+01:00	1.61282E+12	-0.352	-0.216	-0.672
8	2021-02-08T22:00:00.578000Z	2021-02-08T23:00:00.578000+01:00	1.61282E+12	-0.352	-0.216	-0.672
9	2021-02-08T22:00:00.670000Z	2021-02-08T23:00:00.670000+01:00	1.61282E+12	-0.352	-0.216	-0.672
10	2021-02-08T22:00:00.762000Z	2021-02-08T23:00:00.762000+01:00	1.61282E+12	-0.352	-0.216	-0.672
11	2021-02-08T22:00:00.854000Z	2021-02-08T23:00:00.854000+01:00	1.61282E+12	-0.352	-0.216	-0.672
12	2021-02-08T22:00:00.946000Z	2021-02-08T23:00:00.946000+01:00	1.61282E+12	-0.352	-0.216	-0.672
13	2021-02-08T22:00:01.039000Z	2021-02-08T23:00:01.039000+01:00	1.61282E+12	-0.352	-0.216	-0.672
14	2021-02-08T22:00:01.131000Z	2021-02-08T23:00:01.131000+01:00	1.61282E+12	-0.352	-0.216	-0.672
15	2021-02-08T22:00:01.223000Z	2021-02-08T23:00:01.223000+01:00	1.61282E+12	-0.352	-0.216	-0.672
16	2021-02-08T22:00:01.315000Z	2021-02-08T23:00:01.315000+01:00	1.61282E+12	-0.352	-0.216	-0.672

Use of Device

1. Enclosed structure – fully waterproof
2. Battery cannot be changed or charged
3. Operation time:
    i. 2 years stand-by time
    ii. 22 weeks of measurement time

Specifications

- Sensor for movement
- 3D Accelerometer -4G to 4G

- Storage memory: 14 days
- Sensor for temperature
- Battery - In use 22 weeks
- Sampling frequency 11 Hz (22 Hz possible)
- 2.4GHz low energy transfer
- Transfer time for 1 day's data ~5 min

- Length: 47 mm
- Width: 22 mm
- Thickness: 4.5 mm
- Weight:7 grams
- Patch: 3M, Medical approved, ISO 10993-10

General information

CE This product is classified as medical equipment, class 1, in accordance with the directives 2002/96/EC (WEEE), 93/42/EEC, 2014/53/EU (RED), 2014/30/EU (EMC) and 2002/95/EC (ROHS). EN60601-1-Medical Device General Safety. The patch is tested for irritation and skin sensitization (DS/EN ISO 10993-5:2013).

Fibion

Selected Fibion Scientific References

University of Kent

Berkeley
UNIVERSITY OF CALIFORNIA

UNIVERSITY OF JYVÄSKYLÄ

UCA
Universidad de Cádiz

University of the Highlands and Islands
Oilthigh na Gàidhealtachd agus nan Eilean

XAMK
South-Eastern Finland University of Applied Sciences

上海交通大學
SHANGHAI JIAO TONG UNIVERSITY

SeAMK
SEINÄJOKI UNIVERSITY OF APPLIED SCIENCES

NUI Galway
OÉ Gaillimh

University of Worcester

Anglia Ruskin University
Cambridge & Chelmsford

WISCONSIN
UNIVERSITY OF WISCONSIN–MADISON

SLMSR Sylvia Lawry Centre for Multiple Sclerosis Research

ARCADA
University of Applied Sciences

KAMK • University of Applied Sciences

Edge Hill University

ASPETAR
Qatar Orthopaedic and Sports Medicine Hospital
مستشفى جراحة العظام والطب الرياضي قطر

UNIVERSITY OF LEICESTER

Karelia
UNIVERSITY OF APPLIED SCIENCES

UQÀM
Université du Québec à Montréal

Fibion

FIBION WEARABLES

FIBION FLASH

- 9-Axis Motion
- HRV/ECG

FIBION HELIX

- 3-Axis Accelerometer
- HRV/PPG

FIBION G2

- 6-Axis Motion
- Sleep Positions
- Posture Allocation
- Event Marker Button

FIBION VITALS

- 9-Axis Motion
- Temperature
- Respiration
- ECG/HRV
- Sleep Positions
- SPO2

FIBION SENS

- 3-Axis Accelerometer
- Sleep Movement
- Posture Allocation

Fibion

Thanks!

Olli Tikkanen

PhD, CEO, Founder

olli.tikkanen@fibion.com

www.fibion.com