

Biodesign Finland

Programme presentation

"Biodesign Finland is a **need-driven medical technology innovation and training program**, which produces experts in health technology, solutions to healthcare, and new business.

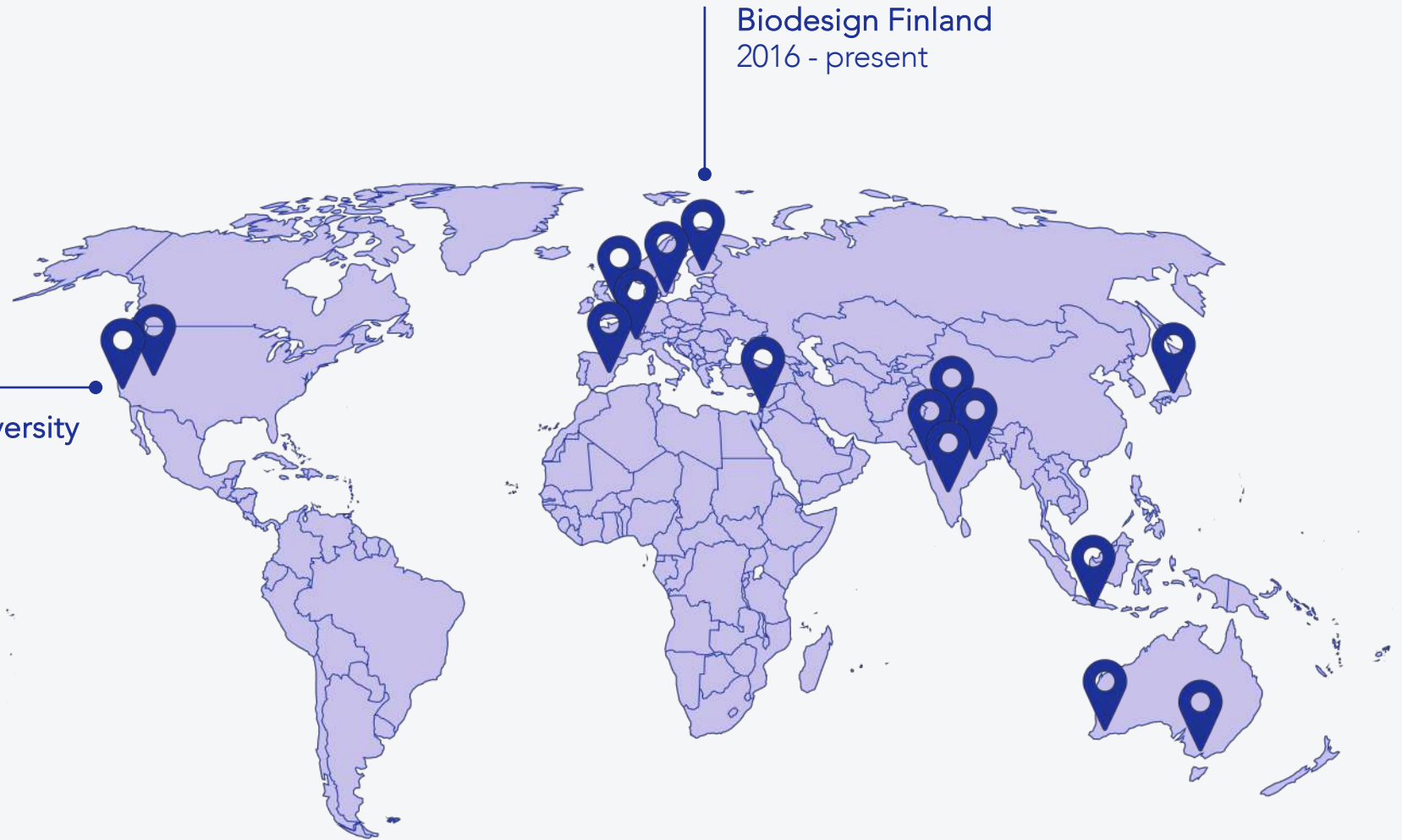
Biodesign aims to offer the **best starting point for creating medical technology** for the benefit of the patient globally.

Biodesign Program

- Biodesign is a need-based innovation program developed at Stanford University that has spread around the world

Stanford University
California

Biodesign Finland
2016 - present



The Biodesign difference?

Idea or research led innovation starts with an idea or a research finding first, then searches for a specific use case and potential users

Need-driven innovation approach starts with the need first (typically for a specific use case for a specific user group).

And Biodesign starts with need finding

THE BIODESIGN PROCESS

IDENTIFY

INVENT

IMPLEMENT



NEED
FINDING



NEED
SCREENING



CONCEPT
GENERATION



CONCEPT
SCREENING

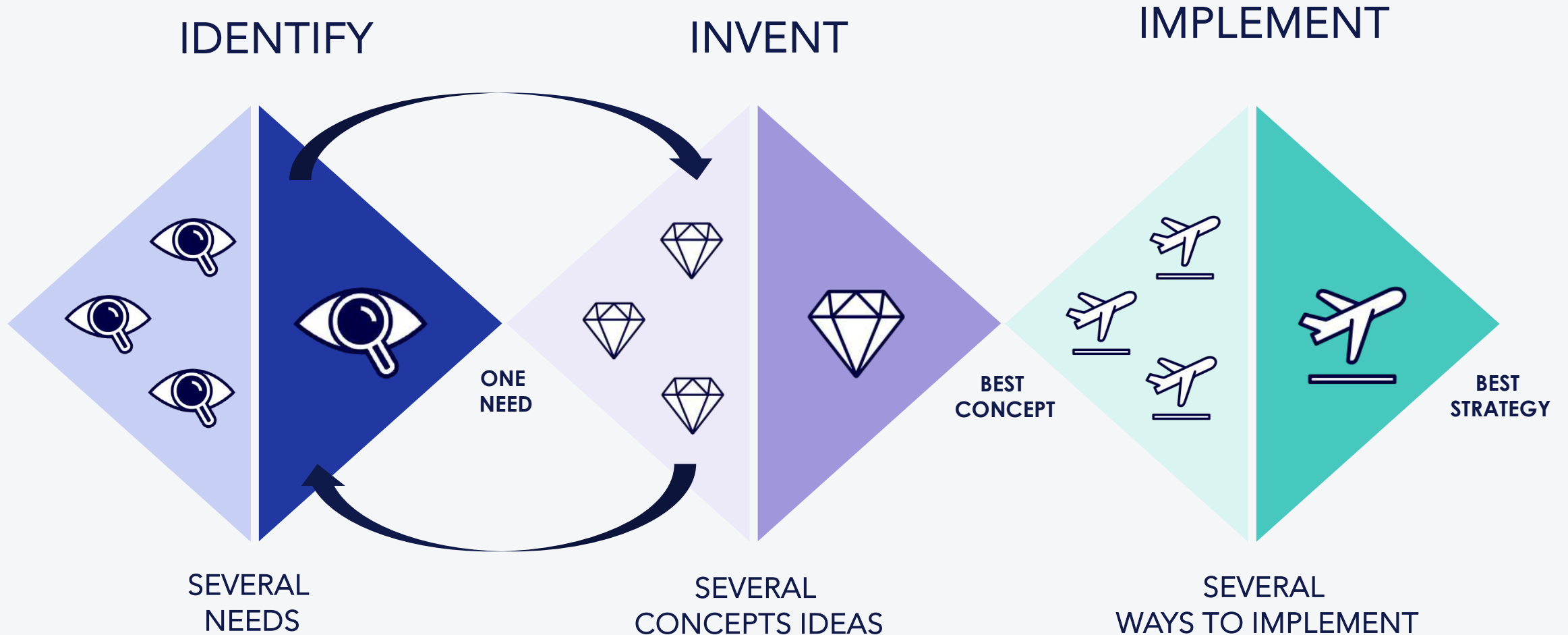


STRATEGY
DEVELOPMENT



BUSINESS
PLANNING

Biodesign is an application of design thinking to healthcare



The program is centered around immersion clinics.

2023	Pulmonary Unit/ Medical Transport
2022	Ear, nose, and throat diseases / Maternity and child health clinics
2021	Emergency Department / Alcohol Confusion Ward
2020	Acute Psychiatry
2019	Gynecology and Obstetrics / Cardiac Unit
2018	Neurocenter
2017	Emergency Imaging
2016	Children's Hospital

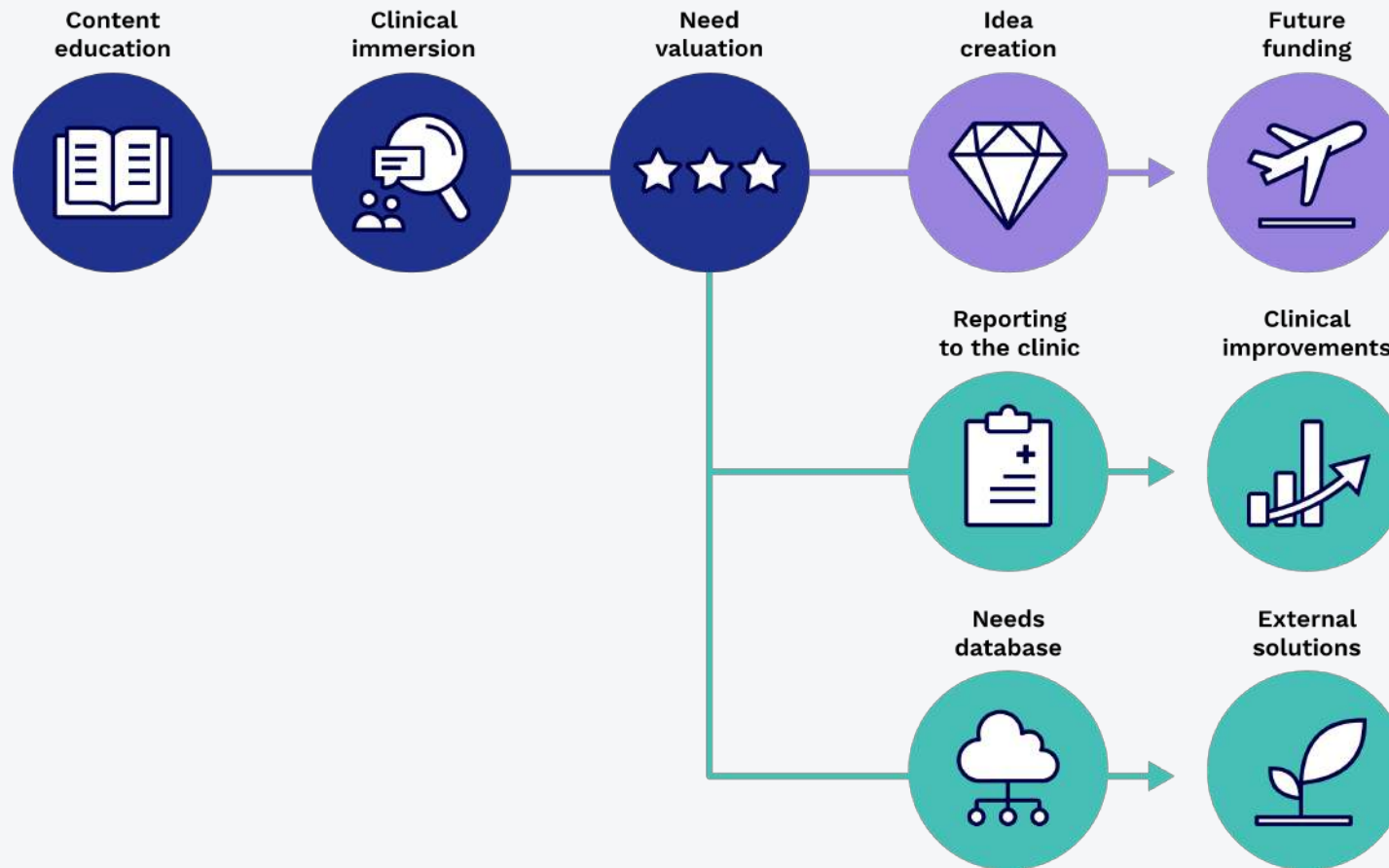


Annual Year

Biodesign Finland annual clock



Program Pathway and Outcomes



Impact from Biodesign Projects

Our impact



~1M Treatments delivered



5 Companies founded



10 R2B projects funded



30 Fellows trained



16M Funding raised



4K Needs identified



Companies from Biodesign

Biodesign Finland

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Koite

Oral bacterial
management



Sakari Nikinmaa
Tommi Pätilä
(Biodesign 2016)

koitehealth.com



Making heart
surgery safer



Kalle Kotilahti
Tommi Pätilä
(Biodesign 2017)

hapekasmedical.fi



Cardiac micro-graft
therapy



Kai Kronström
(Biodesign 2019)

epiheart.fi



Smart stethoscope
with AI



Alexis Kouros
Aki Laakso
(Biodesign 2019)

vitasigns.fi



Surgical
phantoms for ENT



Medical
Devices



Tuomas Klockars
(Biodesign 2018)

cupofent.com
sibbomedicaldevices.com

Companies found during the Biodesign programme

Companies found after Biodesign

Other companies from biodesigners



Catching plastic
from rivers



Anssi Mikola
(Biodesign 2016)

riverrecycle.com



Geographic data
for architects



Tuomas Hyytiä
(Biodesign 2018)

cetopo.fi



Industrial &
concept design



Mikko Seppänen
(Biodesign 2020)

volum.fi

Launched Biodesign originated products

Lumoral

Light-activated solution
for oral health.

Launched in June 2019



ammoral.
HAMMASLÄÄKETIEDEEN
LÄPIMURTOKEKSINTÖ

ai.
ETEEEN
SINTÖ

Paraskin hammasharja poistaa vain 65% plakkia.
Siksi suun ongelmat jatkuvat. Lumoral nostaa
suunterveyden täysin uudelle tasolle.

Sano hyvästit ☑ hammaskivelle
☑ ientulehdukselle ☑ reikiintymisiin

Kokeilemalla tiedät: saatavilla apteekeista ja lumoral.fi

Kokeilemalla tiedät: saatavilla apteekeista ja luma-

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Lumoral.

PERUSTETTU  VUONNA 1889

HELSINGIN SANOMAT

Perjantaina 21. lokakuuta 2022 Viikko 42, N:o 285 (44388) Irttonumero 4 50 E, kotiin tilattuna alk. 147 €/pv (12 kk:n jatkuva tilaus)

88 sivua

MAINOS

Lumoral.

Paraskin hammasharja poistaa vain 65% plakista.
Siksi suun ongelmat jatkuvat.





Tommi Pätälä
Sydänkirurgi, tutkija

Uusin tutkimus vahvistaa: Lumoral nostaa suunhoidon täysin uudelle tasolle

European suurin tentulehdustukimys väittää, että Lumoral piristää merkittävästi inenasekaisen hoitotulosta. Lumoral-säiliön säännöllinen käyttö kotona parantaa tentulehdusta ja suhygienistä moninkertaistaa hoidon tefon. Tukokset ovat ingassa luhaisen Lumoralin käyttöä ja haimasääntöiden kotimästen kanssa.

Nyt suomalaiset tukijat ovat kehittäneet markkinoille tehokkaimman antibiootterien hoidon pilan haittausta. Tehokas jäännöspakin hallinta ehkäisee rekintymistä, hammassikam muodostumista ja tentulehdusta.

Hanki

Siinänsälinen harjaus ja hammasvälien puhdistus ovat suun hoidon kulmakivi. Parashin hammasharja on kuitenkin vain 65 % plakkista jättäen jälkeensä puolet kulkuvälikivistä.

1. Pääsinen S, Saarelä R, Vähänen H, Hekkinnen A, Kerkkälä E, Noponen M, Alappi H, Tervahauta T, Räsänen LT, Sorsa T, Pääs T. A Randomized Trial of Home-Applied Dual-Light Photodynamic Therapy in Stable Chronic Periodontitis—Three-Month Interim Results. *Photodiagnosis Photodynamic Therapy*. 2022;102944 [https://doi.org/10.1016/j.pdp.2022.102944].

2. Nikkari S, Alappi H, Auvunen P, Vuori M, Hännälä J, et al. (2020) Dual-light photodynamic therapy administered daily provides a sustained antibacterial effect on biofilm and prevents *Streptococcus mutans* adaptation. *PLoS ONE* 15(5): e0232775. <https://doi.org/10.1371/journal.pone.0232775>

3. Nikkari S, Auvunen P, Miettinen M, Sorsa T, Rontala J, Alappi H, Kotiranta A, Auvunen P, Kerkkälä E, Meurman JH, Pääs T. Indocyanine Green-Assisted and LED-Light-Activated Antibacterial Photodynamic Therapy in Stable Chronic Periodontitis—Three-Month Interim Results. *Photodiagnosis Photodynamic Therapy*. 2022;102944 [https://doi.org/10.1016/j.pdp.2022.102944].

MAINOS

Launched Biodesign originated products

Sartar Therapeutics
revolutionizing soft-
tissue sarcoma therapy



Launched Biodesign originated products

EpiHeart

achieves a major milestone: first clinical use in August 2022.



Launched Biodesign originated products

Biodesign Finland

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SPECTROCOR

novel monitoring of
cardiac oxygenation



Launched Biodesign originated products

VITAL SIGNS

Rethinking Physical Examinations

Saving time - Performing multiple examination simultaneously

Better Diagnosis - AI based data analysis and decision support

Everywhere - Empowering nurses and caregivers

Improving productivity of healthcare



Bring



Current Biodesign-based R2B projects at Aalto

WE ARE GOING TO CHANGE THIS FOR EVER!

Our invention will replace the stethoscope with a smart, multifunctional connected device, which not only detects, records, analyzes, and documents body sounds, but also performs all other necessary examinations simultaneously. Our device takes the temperature, blood oxygen saturation, ECG, pulse, respiratory phase and rate, blood pressure and heart rate variability among others, all during the same time and process of using a stethoscope, almost exactly as doctors have used it so far.

PATENT PENDING: FI20217164

WILKINSON 2021 | SOURCE FROM INVENTORS

hentoTouch
FUTURE OF ALCOHOL USE DISORDER TREATMENT

PROBLEM: AUD IS A RELAPSING BRAIN DISEASE
260 million patients receive no treatment 85% relapse despite the treatment
Economic burden 1+ Trillion €

SOLUTION: DISCREET AND WEARABLE DEVICE TO PREVENT RELAPSES
Noninvasive neuromodulation
Less relapses, improved QoL
Savings through workplace productivity and wellbeing

BUSINESS: NEW SEGMENT IN AUD CARE
hentoTouch Medical device
Future standard of care
AUD pharma market size 0.8B € ASL CAGR
Huge market gap considering economic burden

COMPETITION: FIRST IN MARKET
No existing medical device interventions targeting AUD.
Closest competitor through IP space
Apex Neuro Inc.

Jukka Planman
+358 50 309 9887
jukka.planman@aalto.fi

Urisens Intelligent Diaper System

Need: Indical pradio, measuring urine parameters are important
30% of men 70% of women > age 60 Urinary incontinence

Approach: Novel method to measure important parameters of urine wirelessly, using a low cost printed sensorsystem

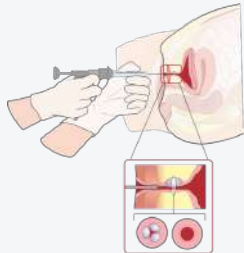
Benefits: For patients, increased quality of life. For caregivers, reduced work and diagnostic information. For health service providers, reduce costs in treatments.

Partners: BIODESIGN FINLAND, A! INNOVATION, SPARK FINLAND

Oguz Taner, PhD More information please contact: oguz.taner@aalto.fi

Solving the Mesh

Submucosal injection of the nanocellulose to support the urethra



2020-2022
Jani Kuula
Eija Raussi-Lehto

NOSORE
No more bedsores

Over 80% of pressure ulcer are avoidable

Nosore is a smart bedsheets that assess pressure ulcer (PU) risk and assist nurses in their PU prevention

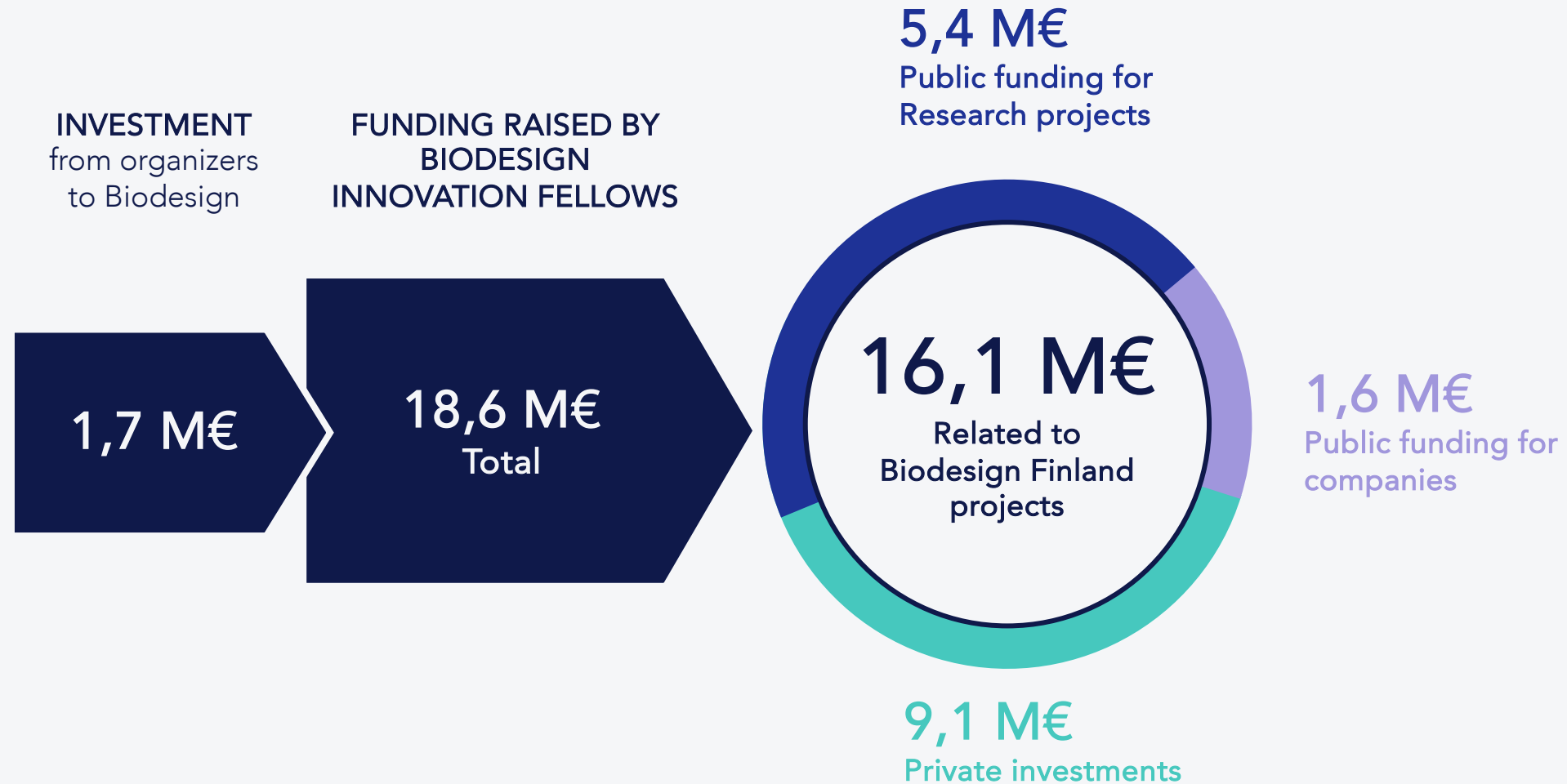
Facts:
\$20,000 - \$150,000 Per patient in USA
4-10 days longer hospital stays
\$26.8B Cost of burden to healthcare in USA

Benefits:
Improved QoL
Effective workflow
Cost reduction, shorter LOS
Improved cost efficiency

Partners: BIODESIGN FINLAND, A! INNOVATION, SPARK FINLAND, BUSINESS FINLAND

Nuno Nobre

Funding raised by Biodesign teams and Innovation Fellows



Impact at immersion clinics

Observations and Needs reports to the Clinics



Renewal of roof terrace of HUS/Psychiatry

Biodesign Finland

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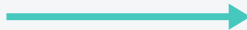
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Biodesign 2020

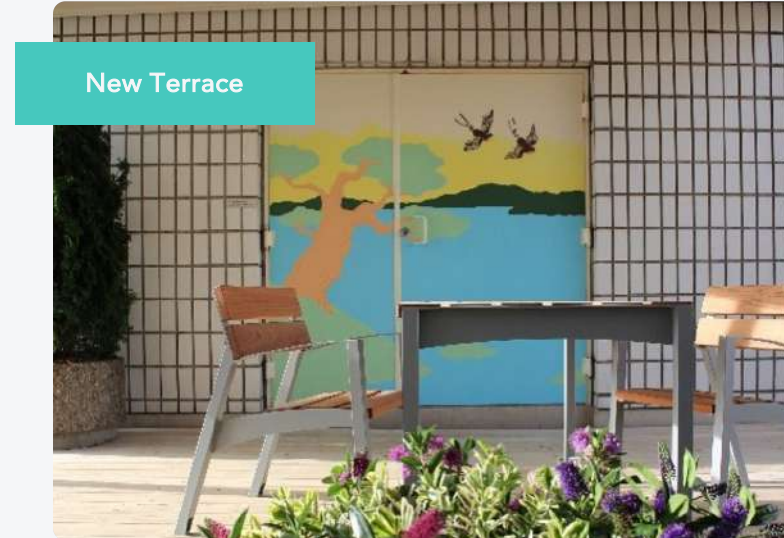
- Impact can also be a collaboration with different organizations where everyone has the goodwill. This project was carried out together with Aalto's landscape architecture students and numerous partners.



1 month
planning &
organizing



3 weeks
renovation



Color-coded doors in alcohol confusion ward

Biodesign Finland

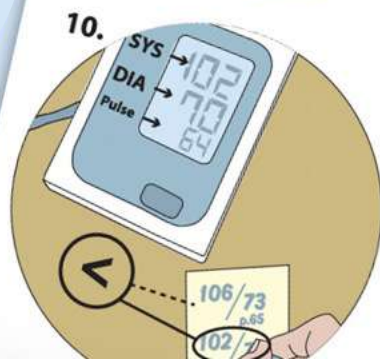
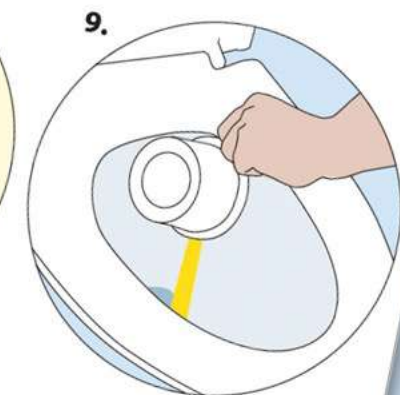
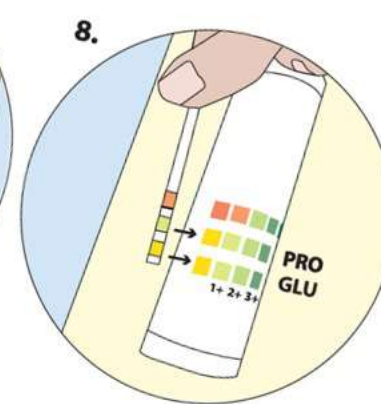
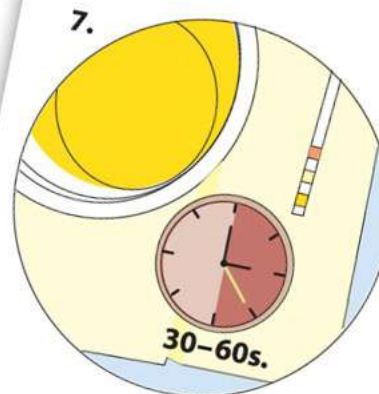
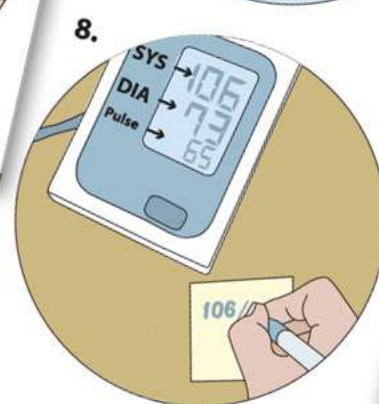
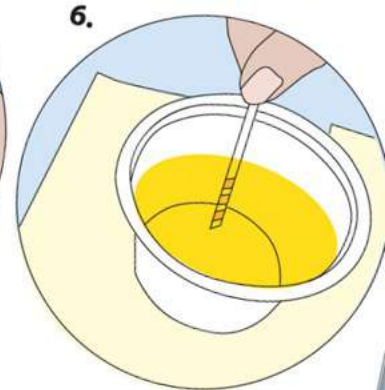
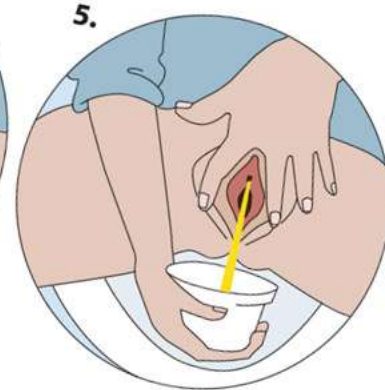
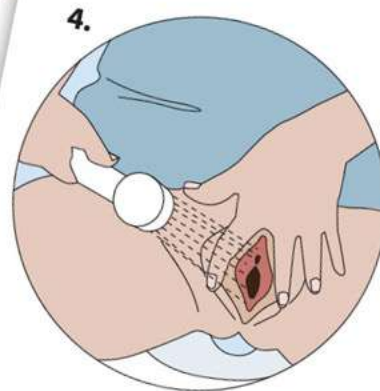
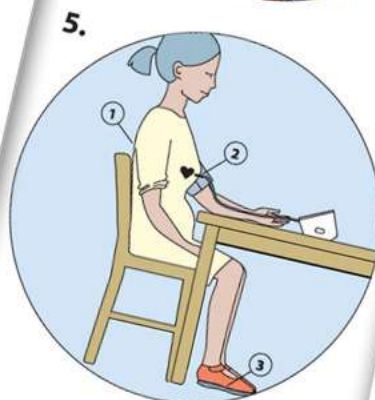
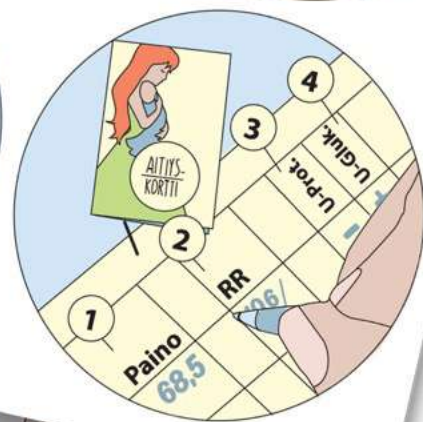
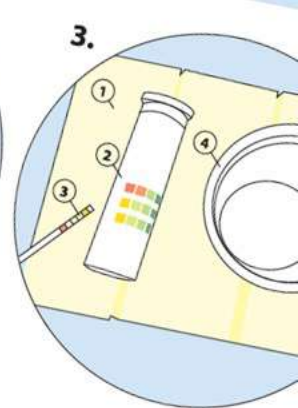
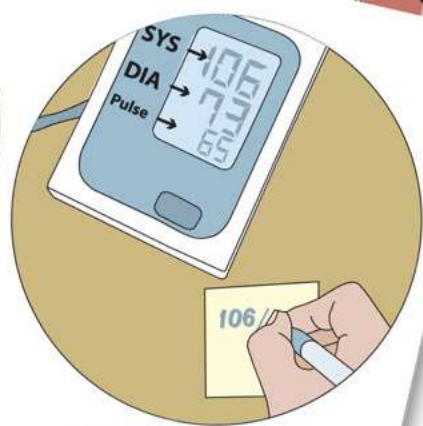
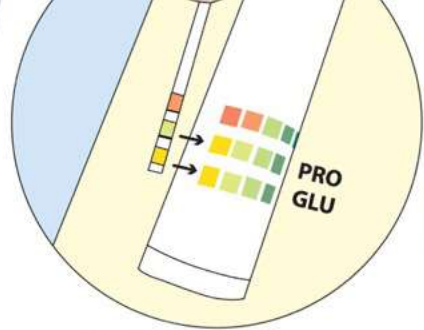
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Biodesign 2021

- Impact can also be a collaboration with different organizations where everyone has the goodwill. This project was carried out together with Aalto's landscape architecture students and numerous partners.





Our team

Steering board



Matti Hämäläinen



Risto Renkonen



Taneli Raivio



Minna Elomaa-Krapu



Håkan Mitts



Johanna Arola



Pekka Kahri



Eija Raussi-Lehto

Program coordination



Heikki Nieminen
Head of Biodesign Finland

-

Head teacher of the programme
Programme expansion and funding



Salla Keränen
Program Manager

-

Process instructor
Team management
Programme development



Otto Olavinen
Impact Coordinator

-

International cooperation
Community and ecosystem communication

Thank you!

Otto Olavinen

Impact Coordinator, Biodesign Finland

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