

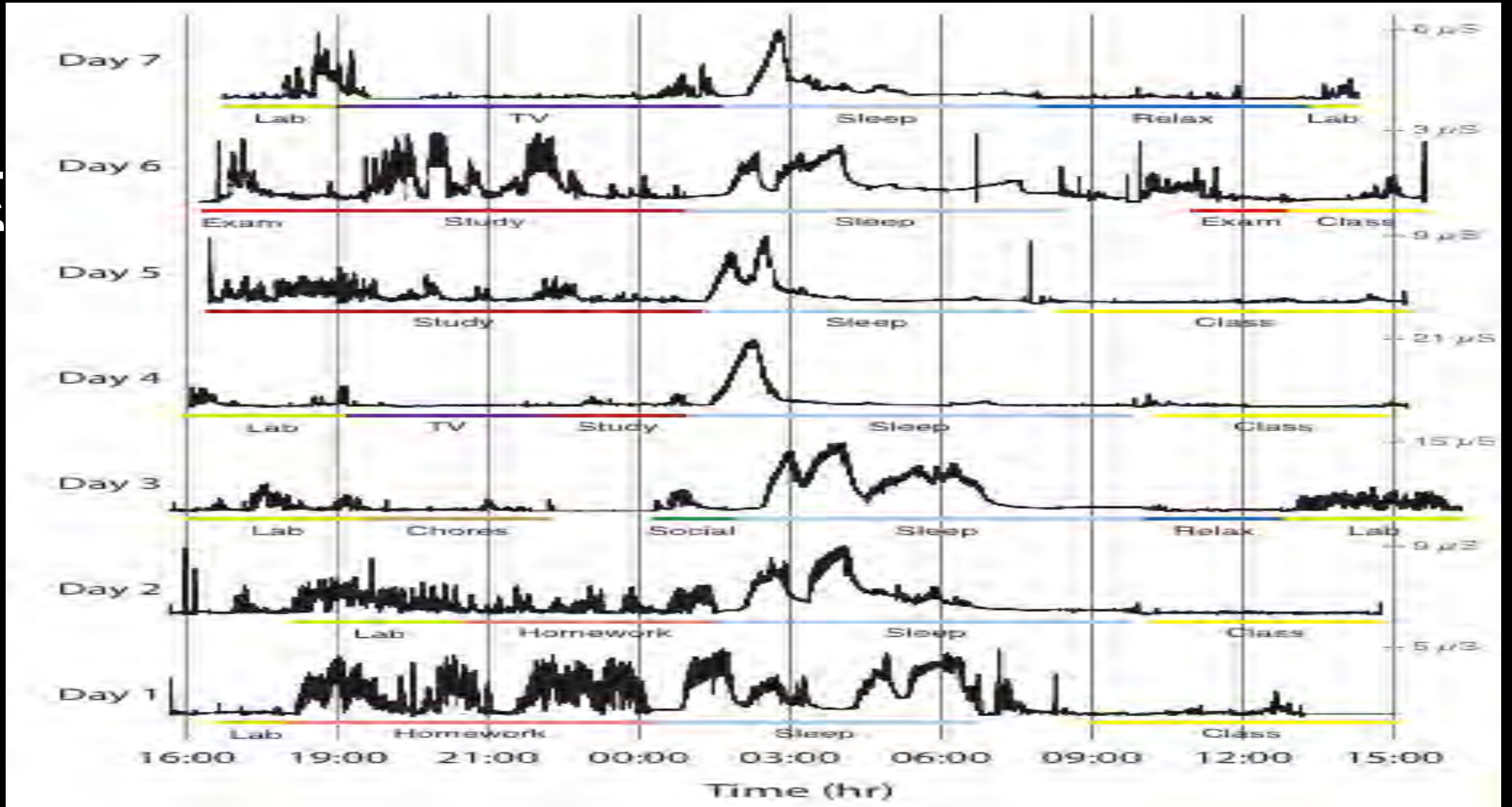
empathica 

Rosalind Picard, Co-Founder & Chief Scientist

Matteo Lai, Co-Founder & CEO

MIT Student, 7 days, 24 hours/day

Electrodermal Activity, μS



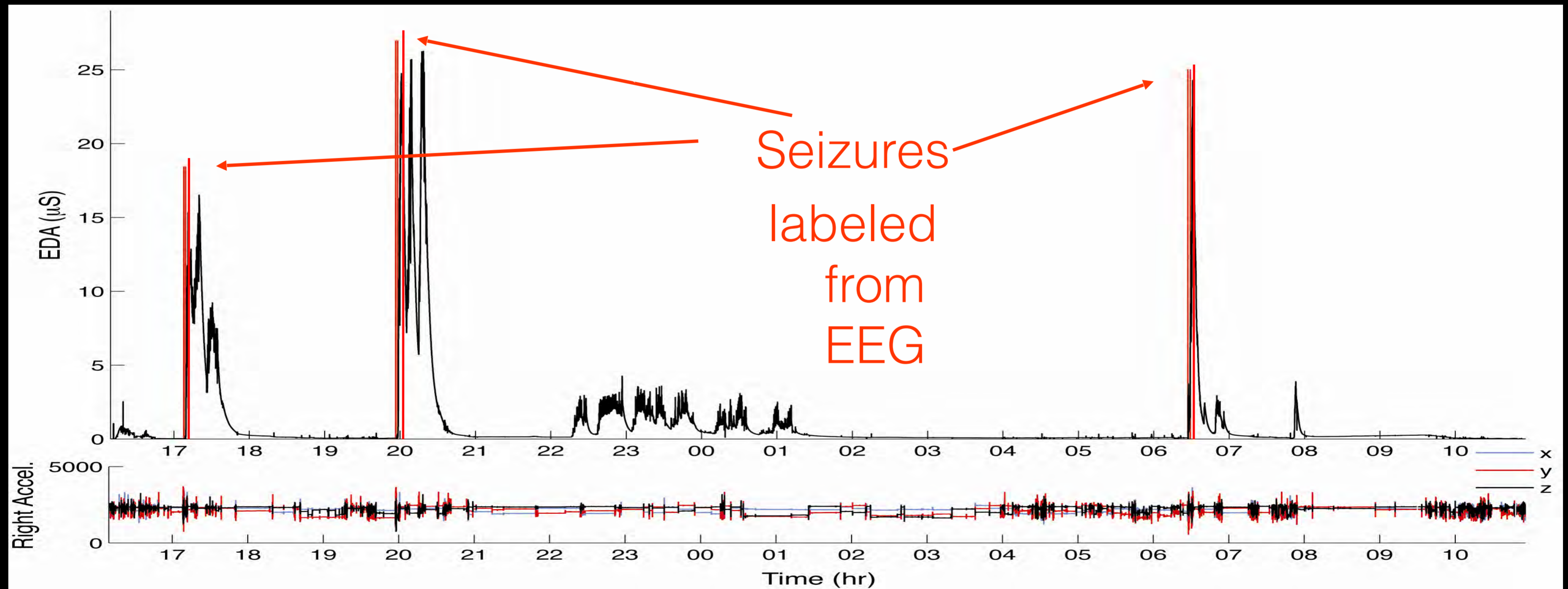
“Can I borrow a sensor to see what is causing stress for my little brother who has autism?”

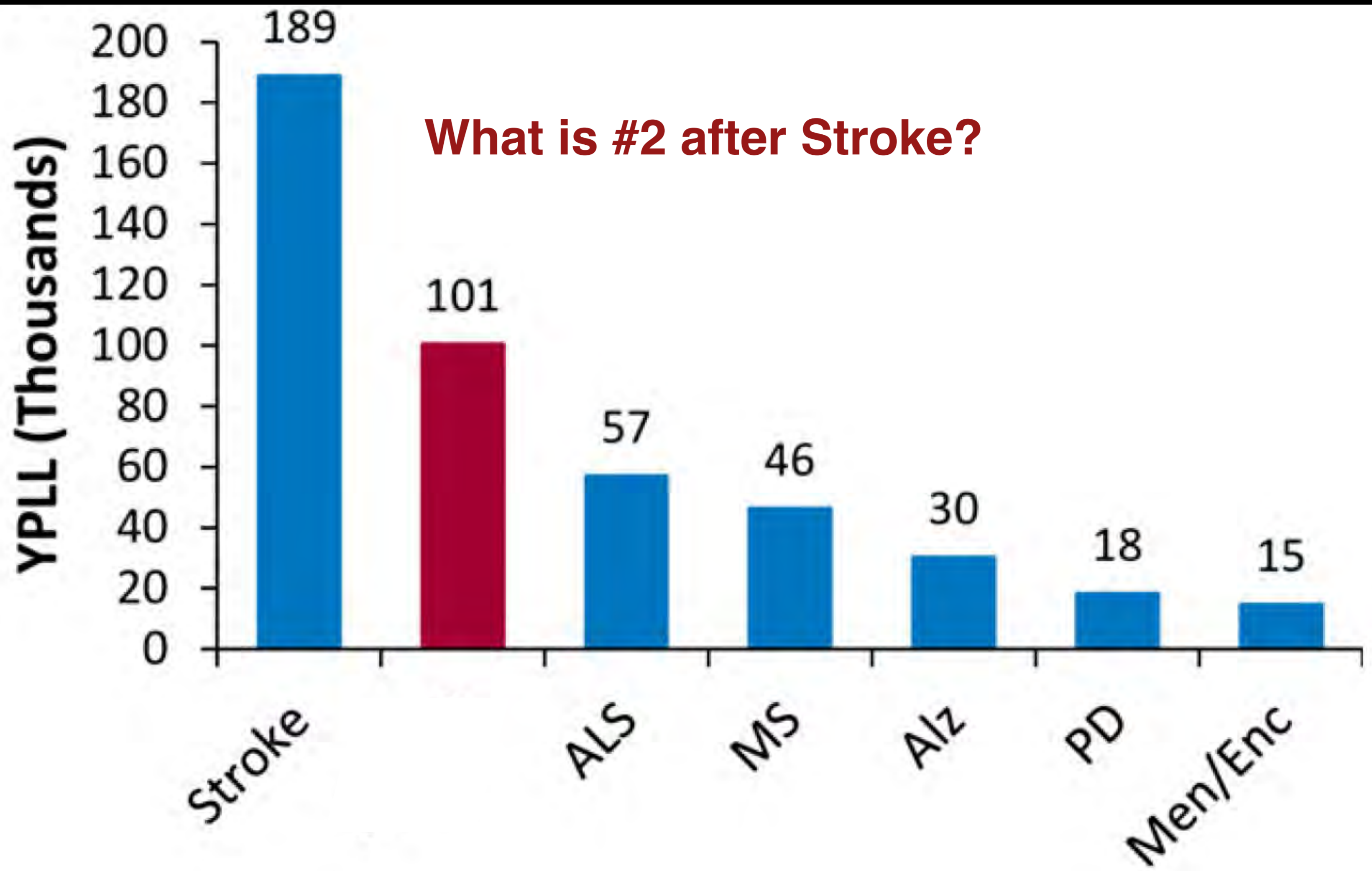




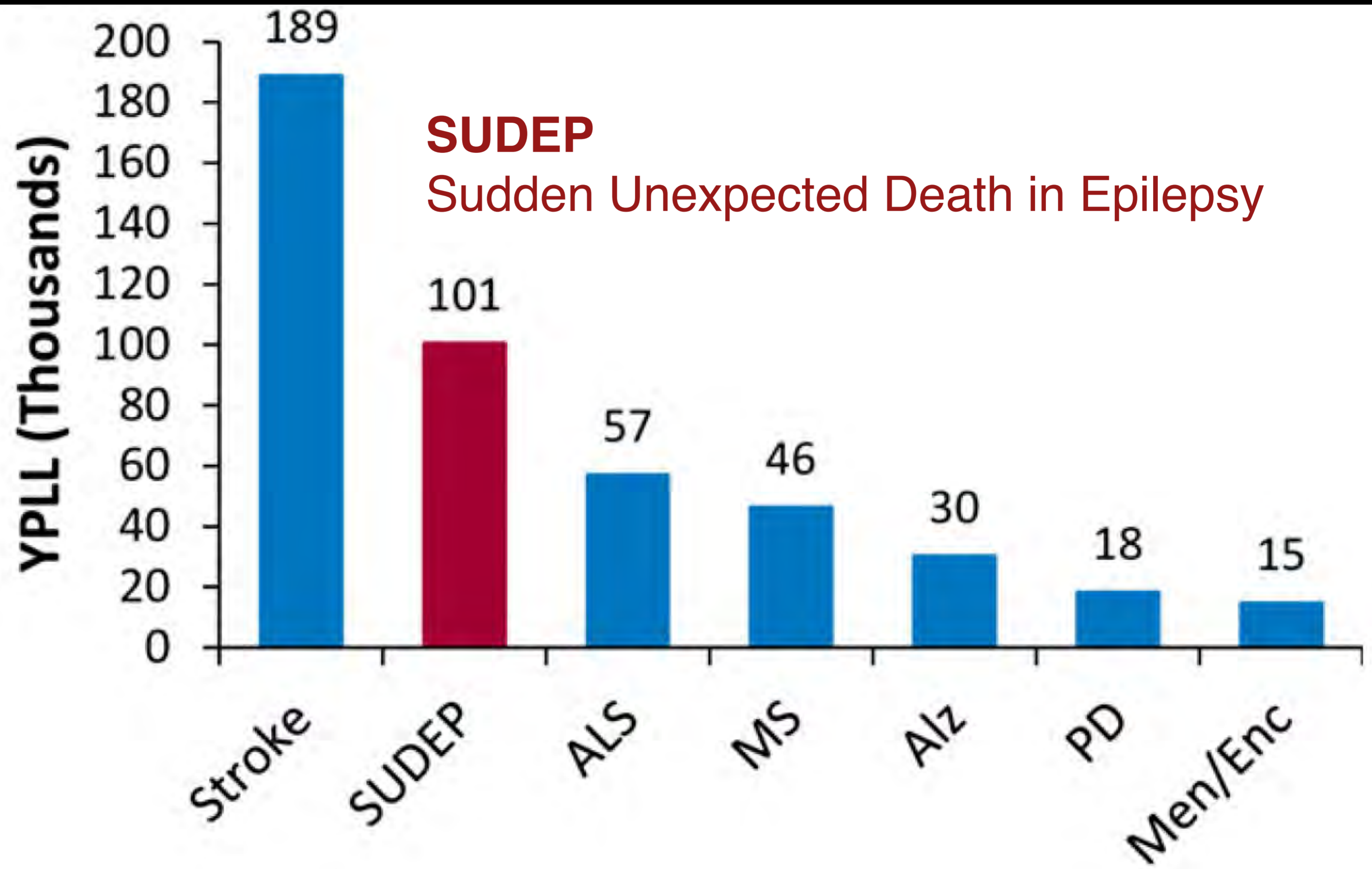
94% accurate convulsive seizure detection using a wrist-worn electrodermal activity and accelerometry biosensor.

Poh et al (2012), *Epilepsia*.





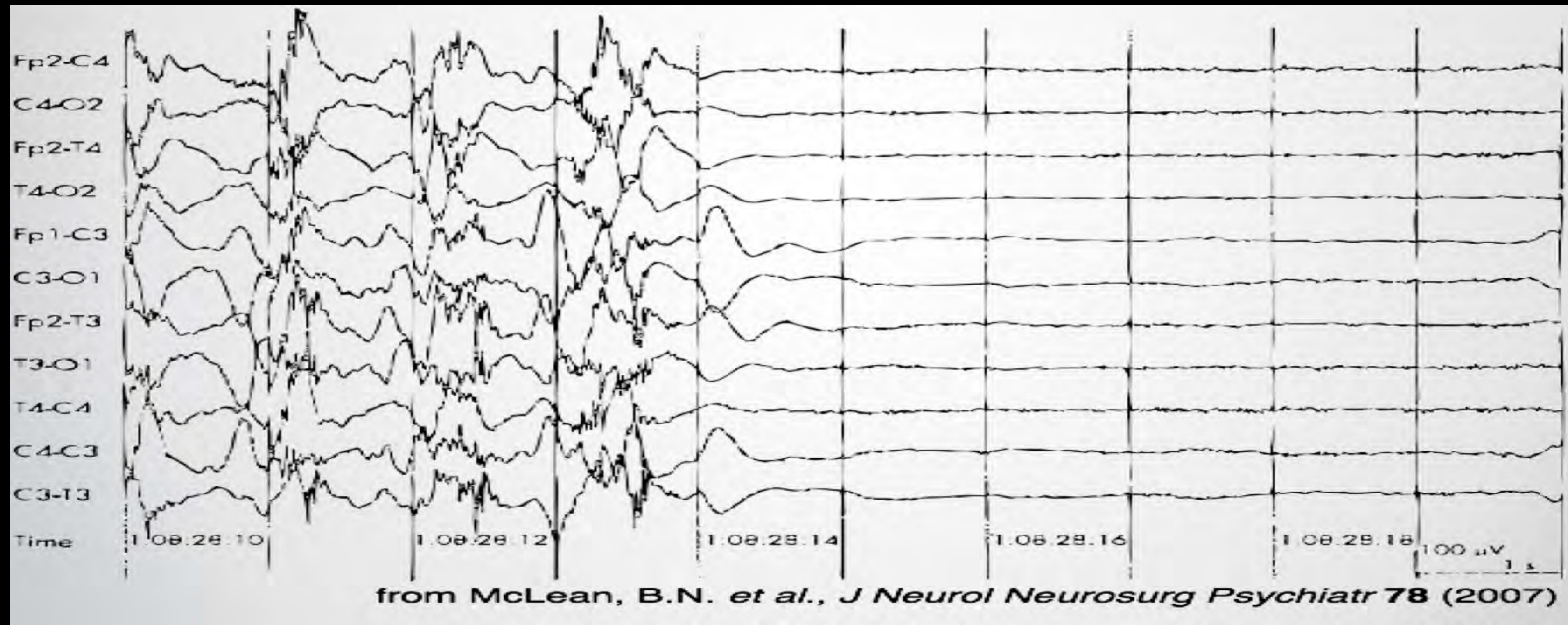
Neurologic diseases that cause death



Neurologic diseases that cause death

Thurman et al. *Epilepsia* 2014

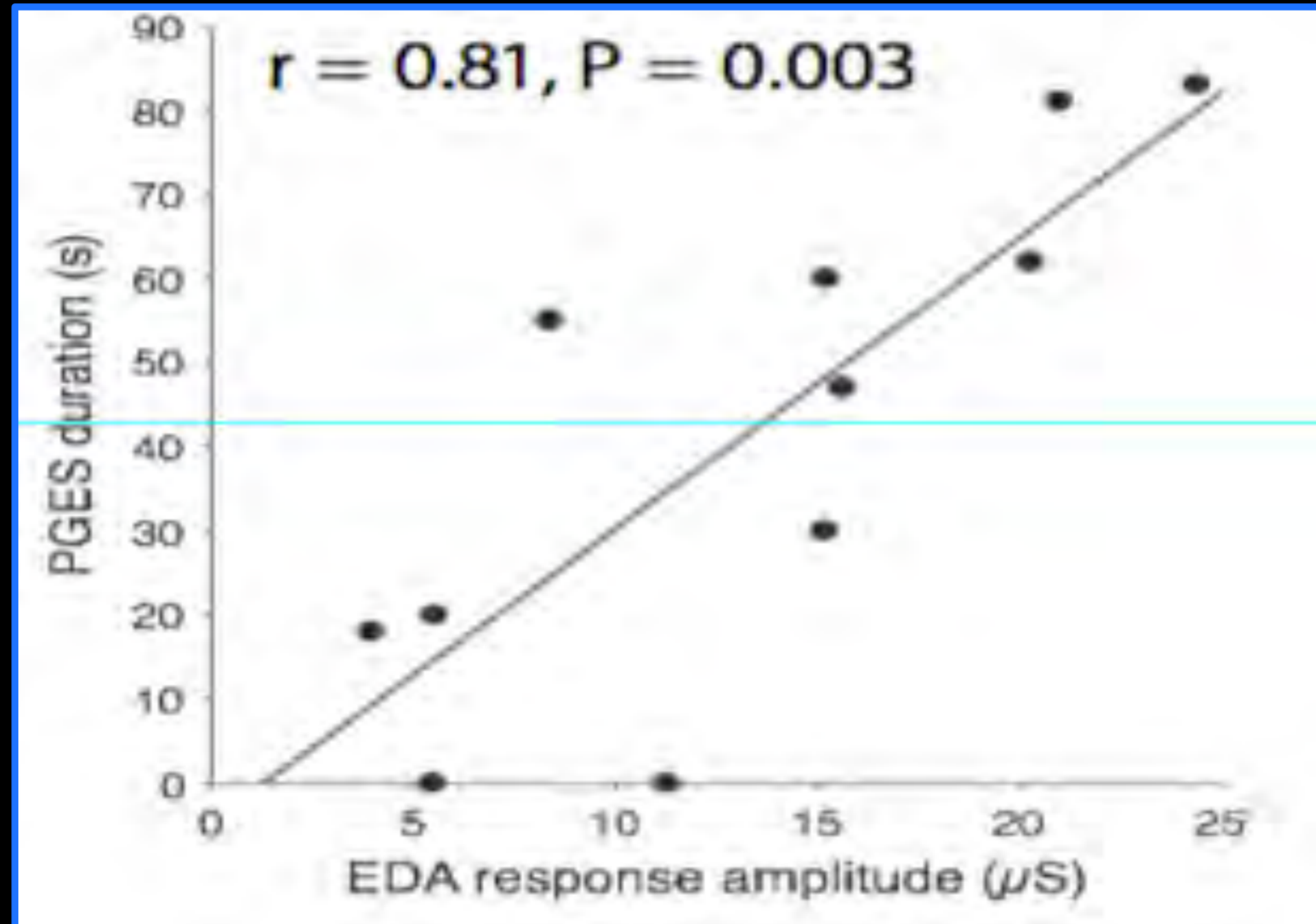
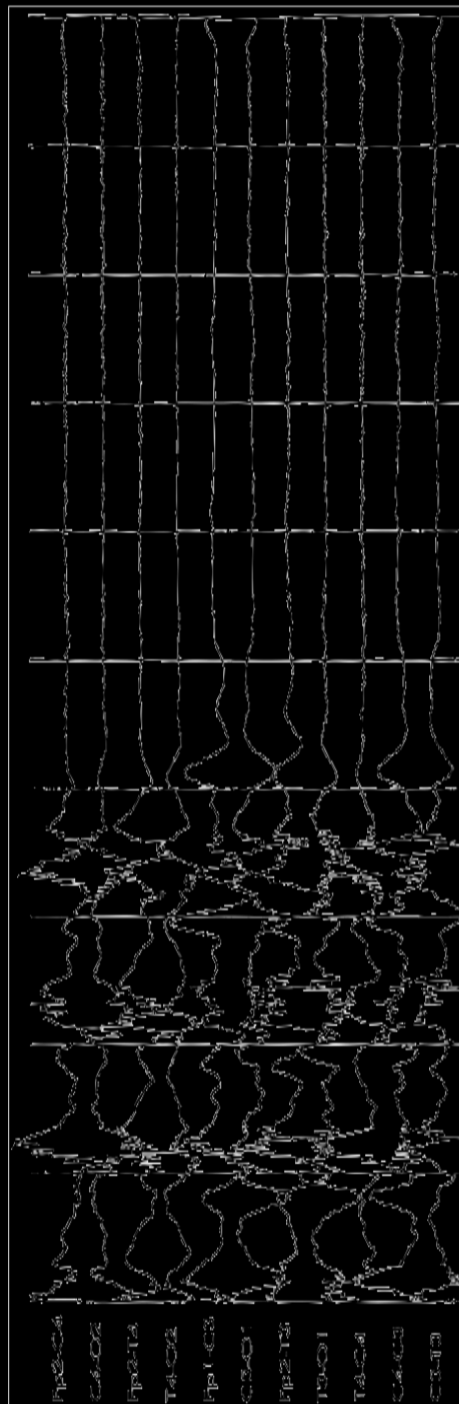
Post-ictal generalized EEG suppression (PGES) was found in 100% of monitored cases of SUDEP. *MORTEMUS* study by Ryvlin et al., Lancet Neurology 2013.



Autonomic changes with seizures correlate with postictal EEG suppression

M.-Z. Poh, PhD, T. Loddenkemper, MD, C. Reinsberger, MD, PhD, N.C. Swenson, S. Goyal, J.R. Madsen, MD and R.W. Picard, ScD

PGES =
Post-ictal
Generalized
EEG
Suppression



The longer the brain waves are suppressed, the bigger the signal on the wrist!



Could an alert prevent most seizure deaths?

**Seizures are like little electrical fires in your brain
There are more deaths from seizures than from house fires
(more than 1 death every 10 mins)**

Physical Activity

Sleep

Time

Temperature

Autonomic Stress

Alerts

Water-resistant

API

\$199

empathica 







Nominated for Alexander Fleming Award

<http://bit.ly/VoteEmpatica>

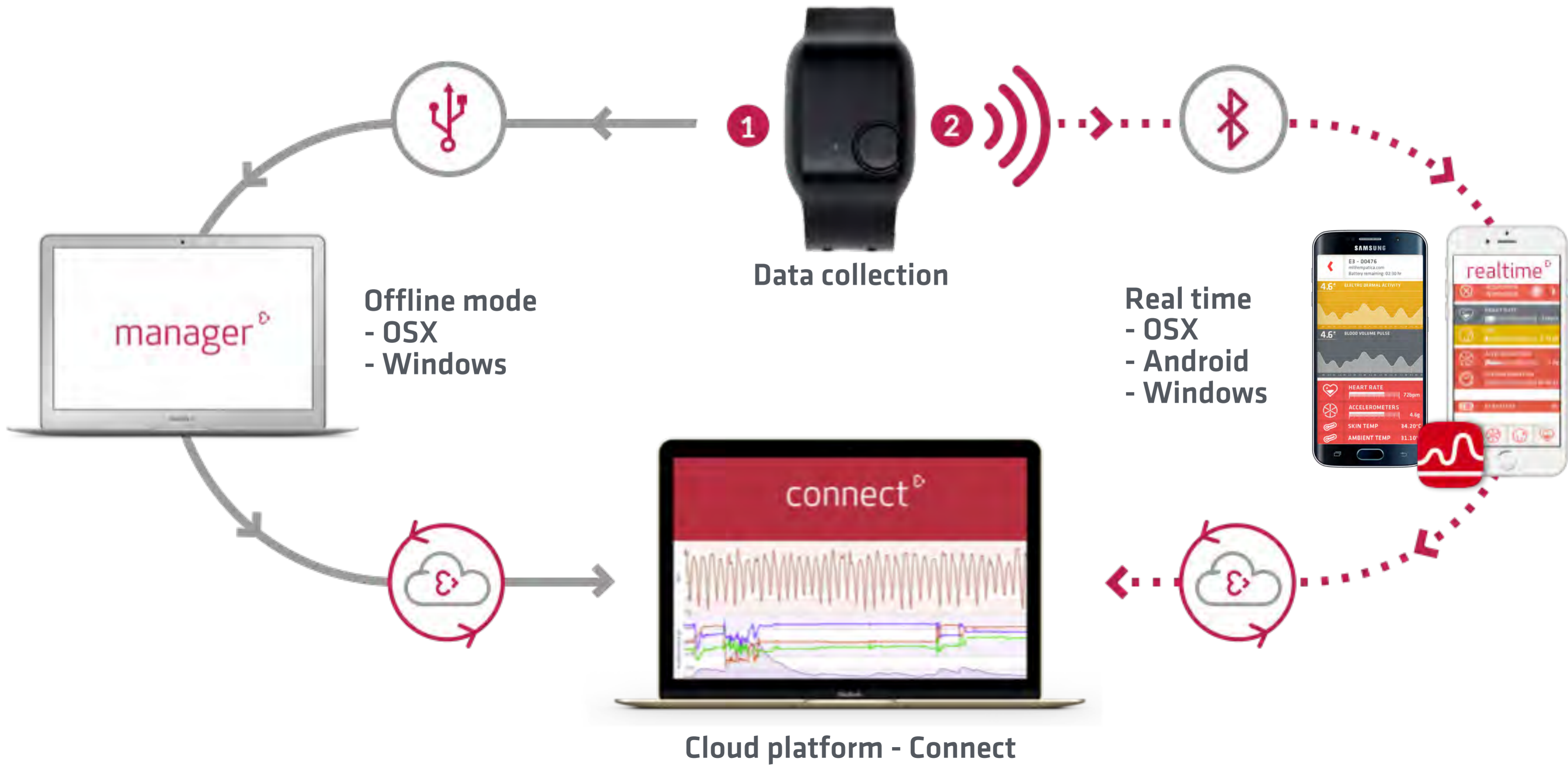
E4 wristband

Access signals from sympathetic and parasympathetic branches of the autonomic nervous system in a compact wearable.

CE Medical Certified



E4 ecosystem: device, apps, algorithms



Some of the projects we support

- Sleep disorders and insomnia
- Addiction
- Hypoglycemia
- Affect dysregulation
- Alcoholism
- Oppositional defiant disorder
- Alzheimer's
- Pain management
- Anesthesia
- Parkinson's disease
- Anxiety disorder
- Phobias (and desensitization)
- Autism spectrum disorders
- Psychiatric counseling
- Bipolar disorder
- Quadriplegia (or paraplegia)
- Schizophrenia
- Dementia
- Sensory processing & modulation
- Depression
- Sexual dysfunction
- Dysthymia
- Post-traumatic stress disorder
- Attention deficit hyperactivity disorder
- Dermatology (e.g. Eczema)
- Sociopathy
- Diabetes
- Stroke
- Dialysis
- Temporary paralysis
- Drug trials
- Thyroid dysfunctions
- Endocrine disorders
- Epilepsy
- Hot flashes
- Cystic fibrosis

**Building the world's best, and largest,
platform for monitoring and treatment of
neurological chronic diseases. Our first use
case is Epilepsy.**

**We create groundbreaking technology that is
friendly, caring and more human.**

How we improve life for people with Epilepsy



sensors

Design medical quality sensors that are comfortable to wear



Epilepsia

human data analytics

Develop seizure detection algorithms that are reliable in daily life



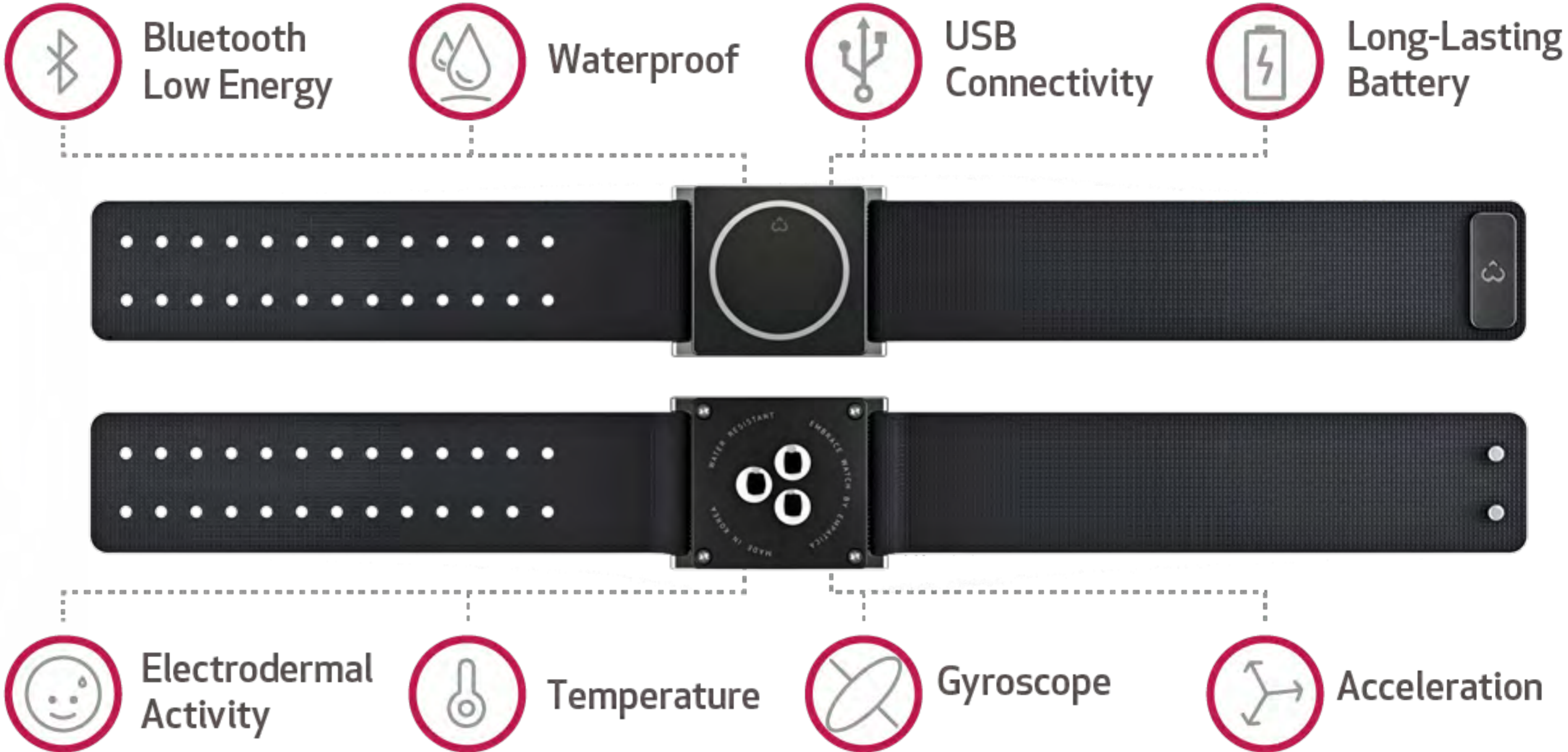
help

Provide insights and alerts to reduce seizure frequency and SUDEP

EMBRACE WATCH



Embrace, a gorgeous watch designed to save lives



Ecosystem



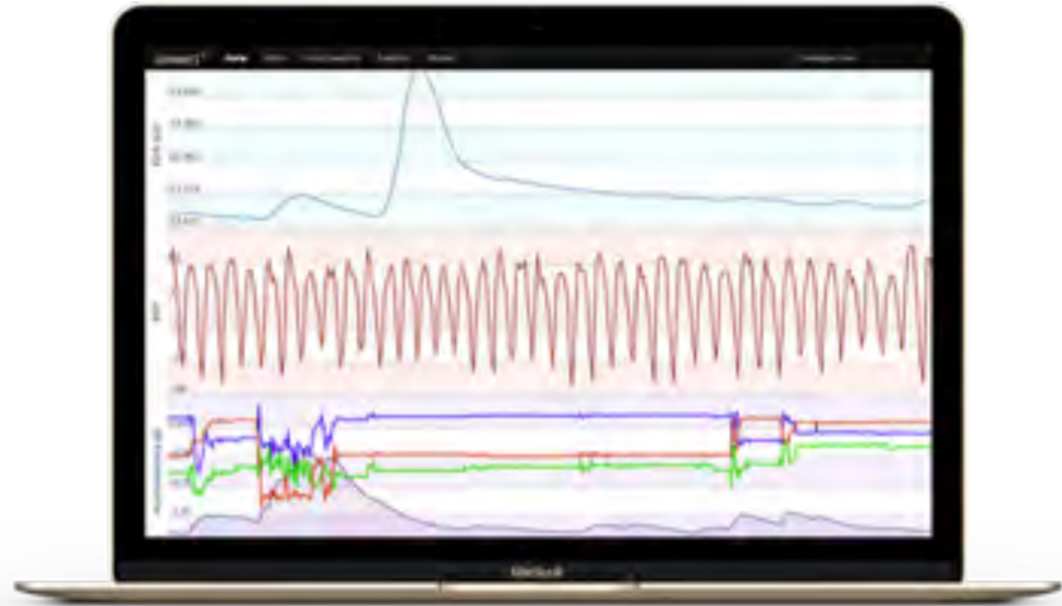
Embrace Watch



Mate App

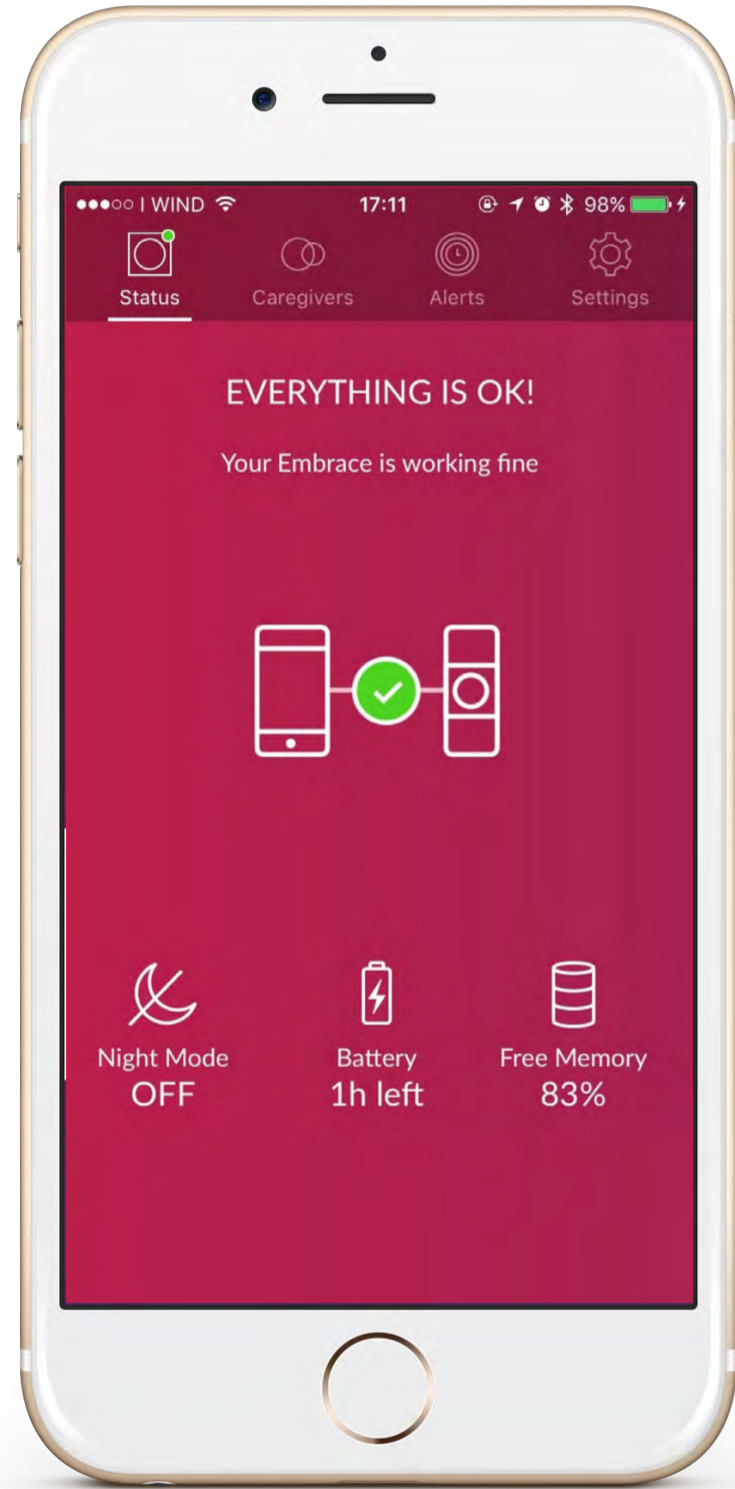


Alert App

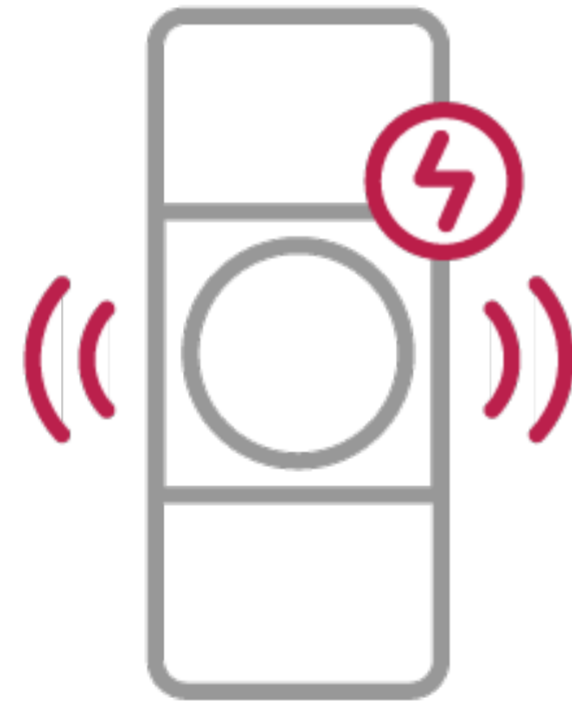


Data services
- researcher
- physician

Get help quickly



Event Detection



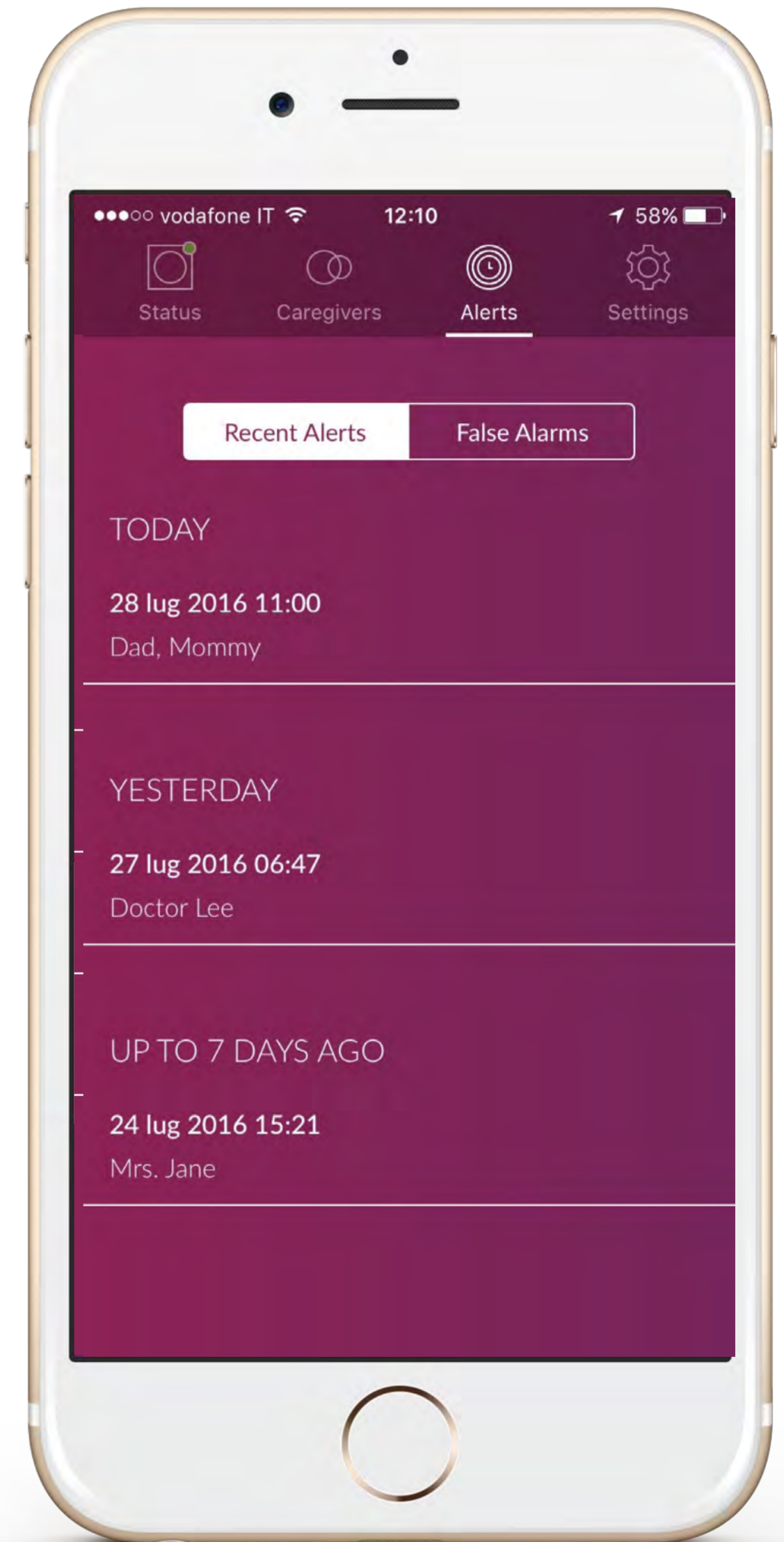
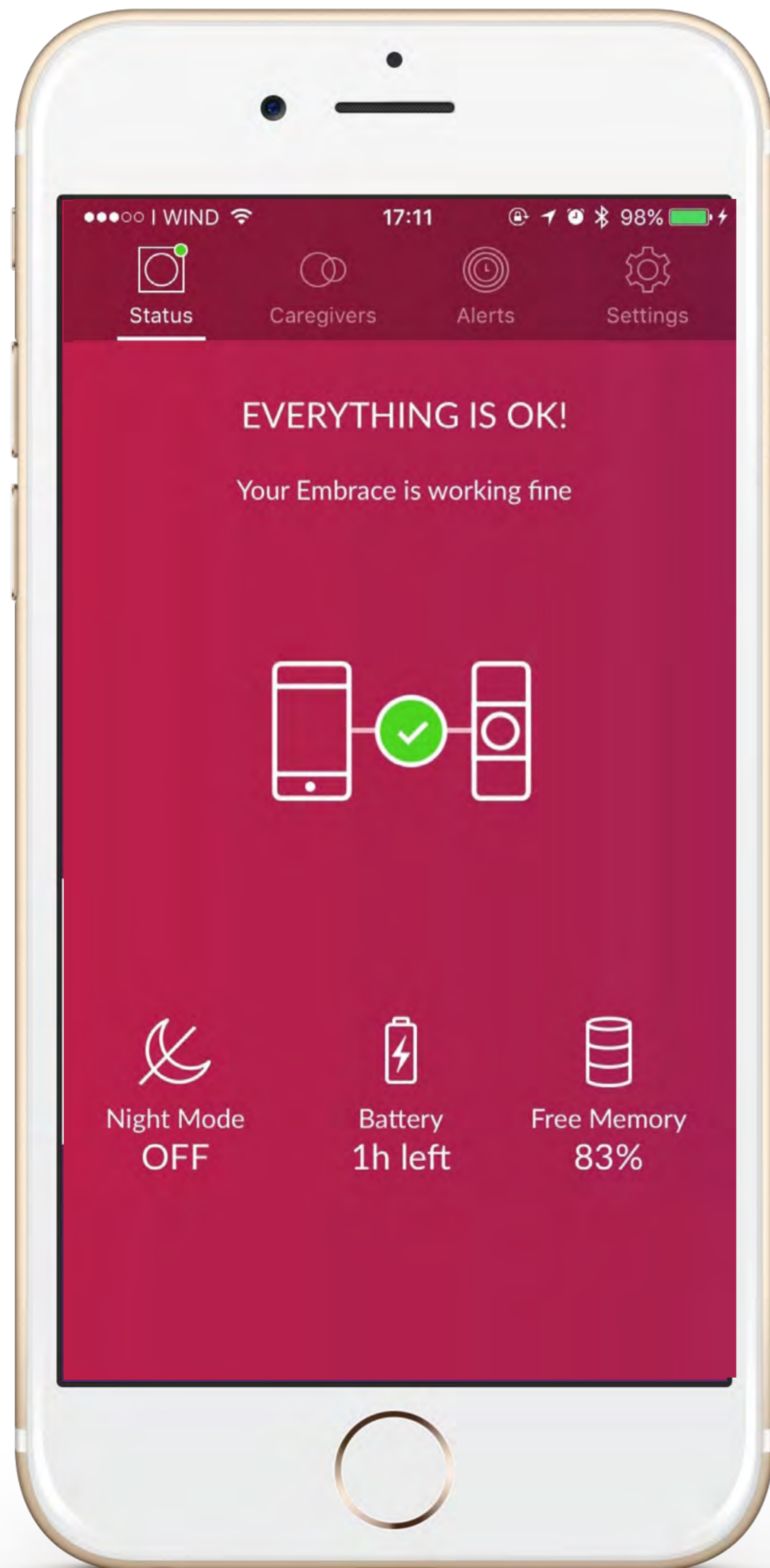
Share Alert with Caregivers



Event Notification



Alert App



Smart forecast



Monitoring Daily Activities



Data Analysis

- Electrodermal Activity
- Accelerometers
- Temperature



Clustering Comparison



Visualize Patterns



Mate App: Comprehensive diary

Activity monitoring

Sleep monitoring

Sympathetic stress



Semi-automated Diary:

- Automatic sleep tracking / alarms
- Location/activity
- Medication reminders / logging with “snooze”
- Convulsive Seizures (as part of a clinical trial)

Customized tracking of triggers

- Event marking
- Meal log
- Caffeine
- Alcohol, etc.

Change the life of a child



Strongest recognition of excellence by the epilepsy community



Epilepsy Innovation:
Seal of Excellence



Best new
technologies 2015



Raised \$780000



Crowdfunding
hero 2015



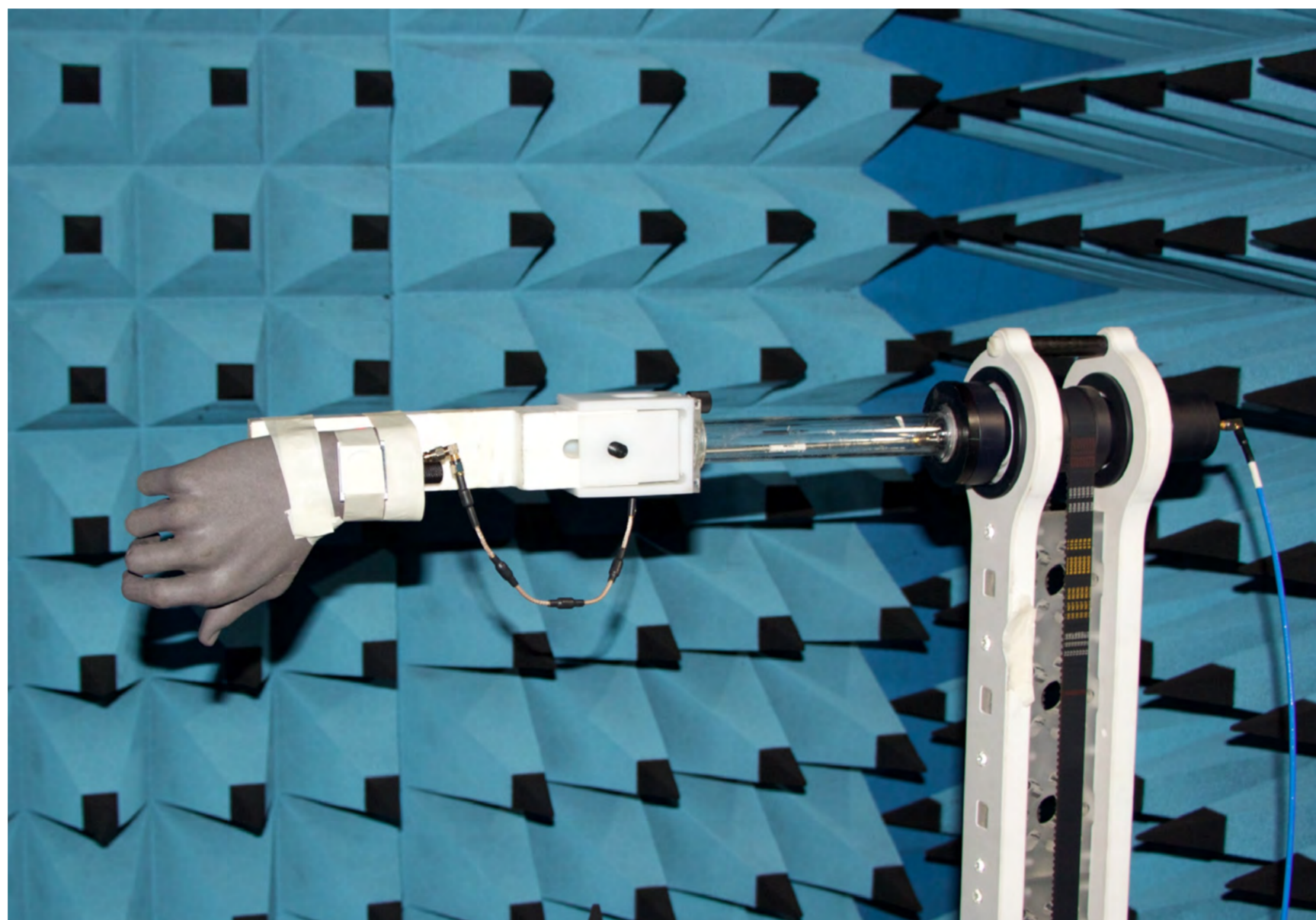
2015 Best Innovation
in Wearables



reddot design award

2016 Red Dot
Product Design Award

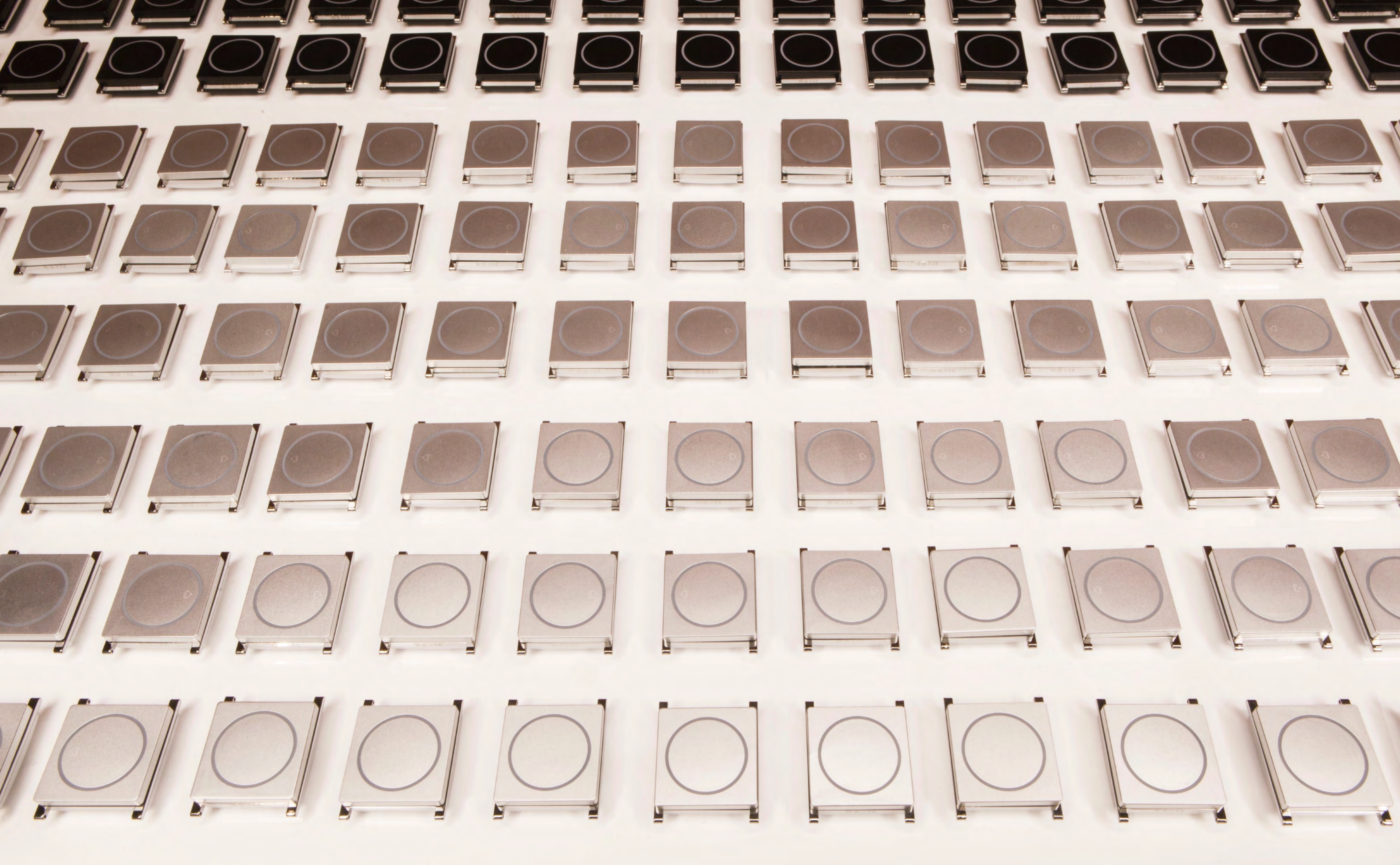
A lot of testing...



...with the help of some tough users



**+ Tumble test, Drop test, Swimming, Steam room,
Sauna, Sports & fitness, etc..**



VERIFICATION+VALIDATION



HARDWARE

- 1
- 2
- 3
- 4
- 5
- 6

SOFTWARE

- 7
- 8
- 9

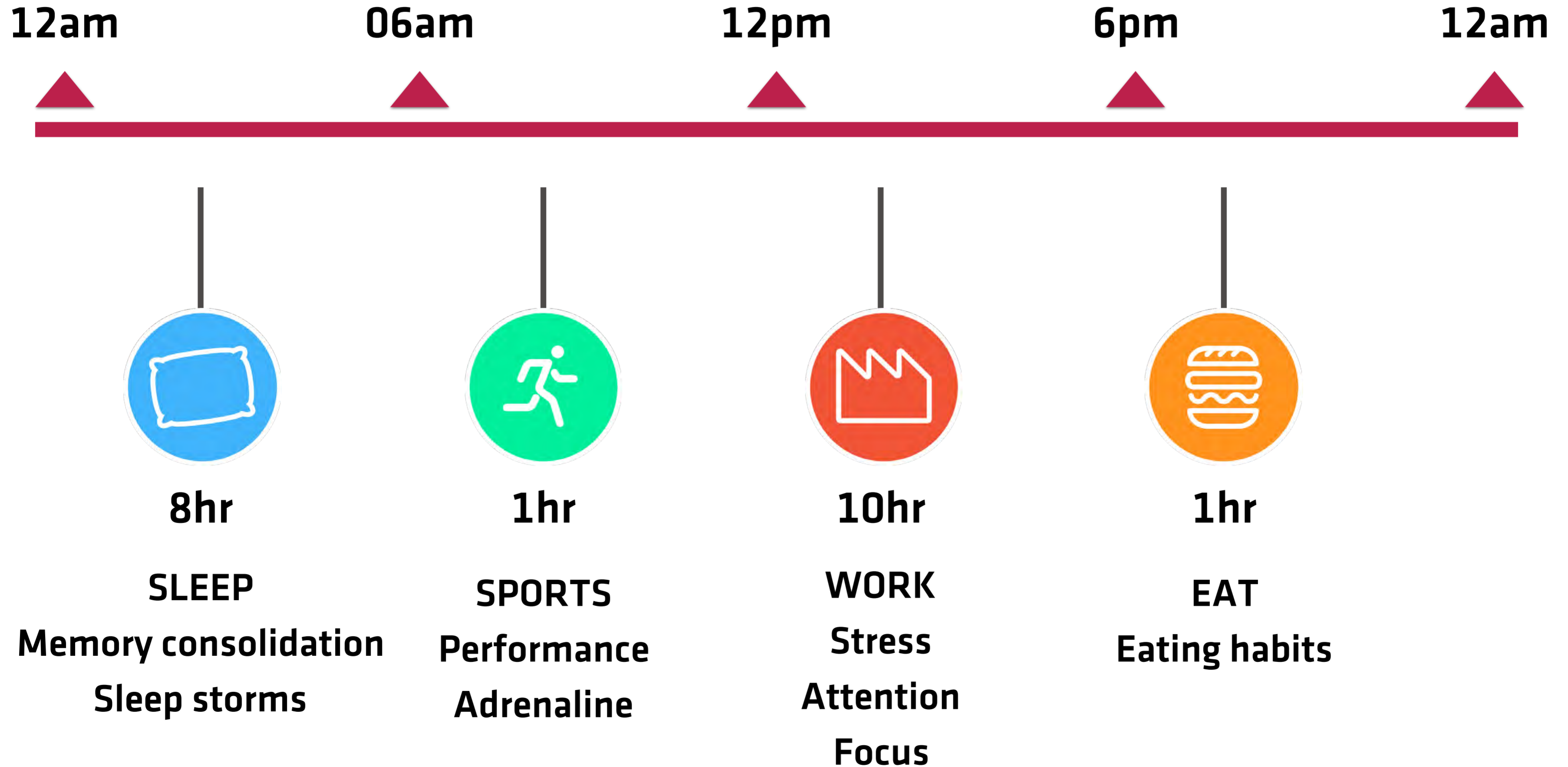
RESEARCH/DATA

- 10
- 11
- 12

INTEGRATION

- 13
- 14
- 15

Studying human behavior




SAMSUNG


Empatica 9:41 AM 100%

15 Tue 16 Wed 17 Thu 18 Fri 19 Sat 20 Sun 21 Mon


TODAY'S HIGHLIGHTS

Sleep 

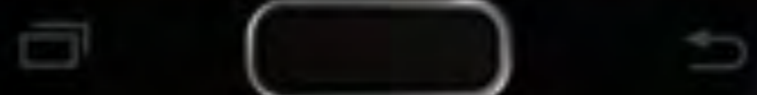
11:22 h

Alerts 

1

Meds 

1/2



thanks!

Matteo Lai

ceo@empatica.com

support@empatica.com