

Health Management for Addiction Recovery

Team #7 - Landscape

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Society is Facing a Growing Problem



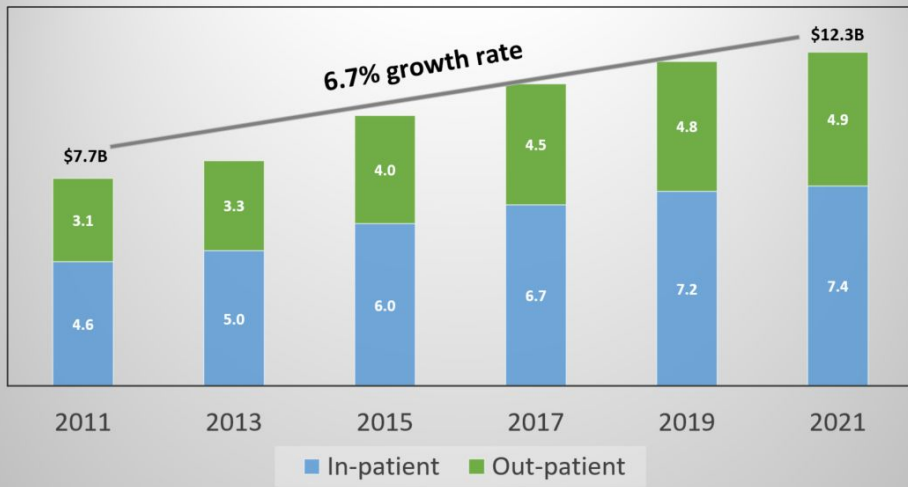
Substance abuse in the US affects **21.7 million** people

That's **1 in 8**,

And is growing **6.7%** each year

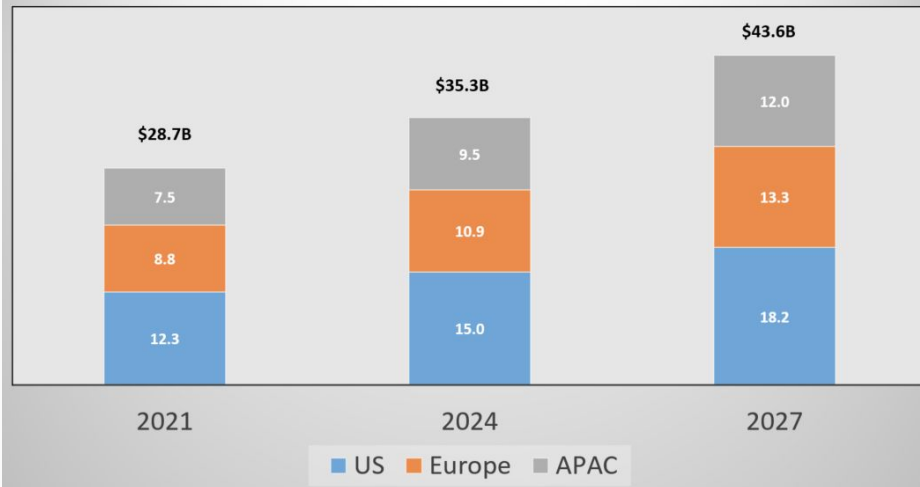
Drug Rehab. Market is Large... and Growing!

US Market Size (in \$ Billion)



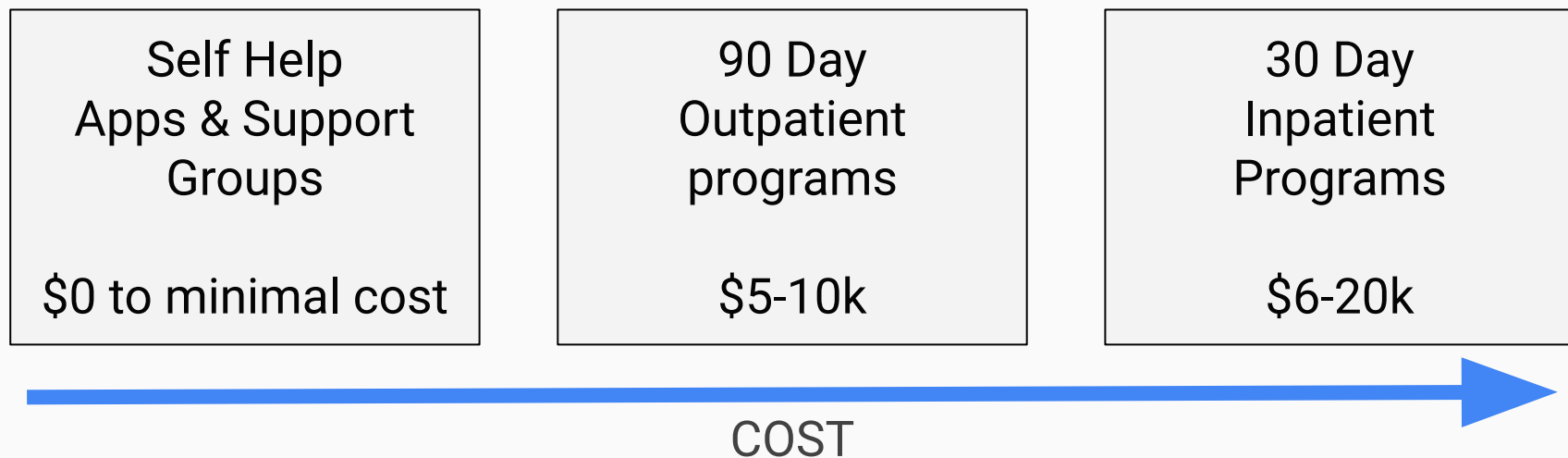
- \$12.3B US Market Size in 2021 (60% inpatient + 40% outpatient)

Worldwide Market Size (in \$ Billion)



- \$28.7B Worldwide Market Size in 2021
- US/EU/APAC growth rate:
 - 6.7%/7.1%/8.2%

Incumbent Support Programs



Relapsing

40-60% of individuals relapse within...
30 days of completing...
inpatient drug and alcohol treatment center.

85% relapse within the first year

Why?

Mental Health

Withdrawal

**Boredom &
Isolation**

**Emotions
& Stress**

**People,
Places,
Things**

Developing Solutions

Software



Hardware



Healthcare



Software for Rehabilitation

FDA Approving **Software-as-Medical-Device** in 2017

<https://www.fda.gov/news-events/press-announcements/fda-permits-marketing-mobile-medical-application-substance-use-disorder>

Pear Therapeutics Case Study

Patient App



Clinician UI

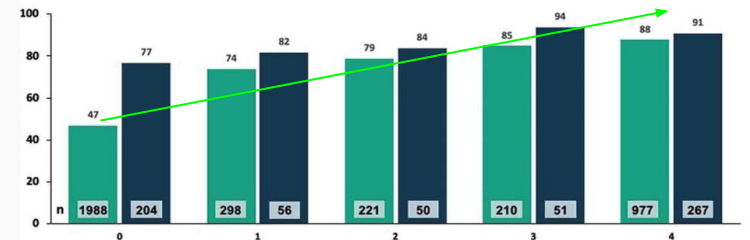


Manual Data Entry

Triggers
Cravings
Relapse

Lessons & Coaching

Prevented drug relapse by **>20%**



<https://www.tandfonline.com/doi/full/10.1080/21548331.2021.1974243>

Hardware for Rehabilitation

Successful Clinical Case Studies:

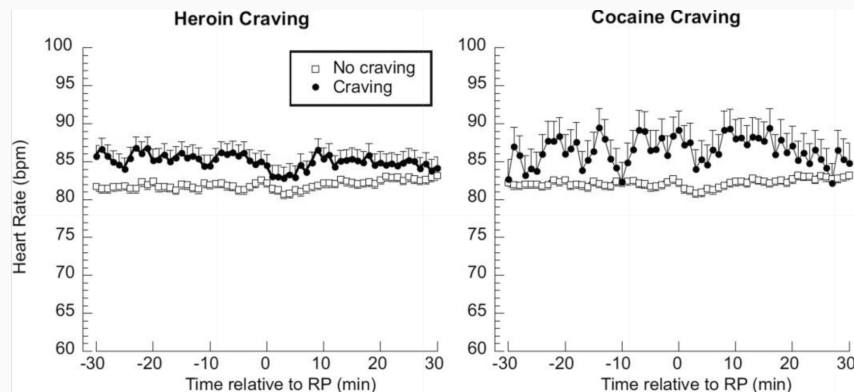
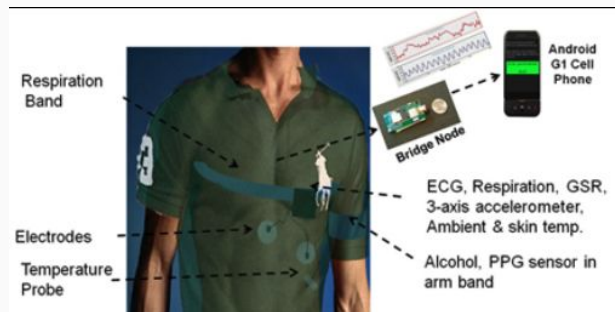
Empatica E4: Wrist mount multi-sensor



Classification Case	Accuracy
Stress vs. No-Stress	81.30%
Craving vs. No-Craving	82.10%
Craving vs. Stress	80.70%
Craving vs. Stress vs. No-Stress	66.90%

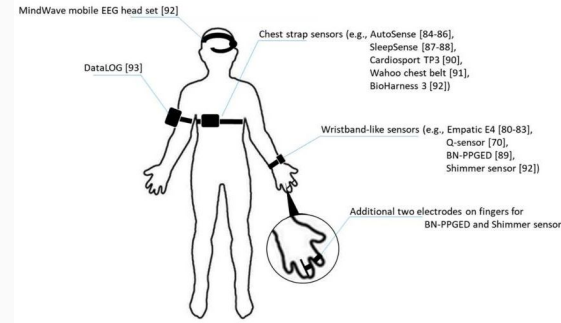
<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7197459/>

Autosense: Chest Mount Multi-sensor



<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4447529/#R10>

Tracking is the New Norm



Market	Market Size - 2020 in USD Bn	Annual Growth Rate
Wearable Fitness Technology Market	9.63	13.7%
Wearable Healthcare Devices Market	18.34	20.5%
Wearable Computing Market	34.61	20.7%
Electronic Sensor Market	21.23	12.26%
Wearable Artificial Intelligence(AI) Market	19.41	29.75%

Detecting Relapse

WHY?

Mental Health

Withdrawal

Boredom &
Isolation

Emotions
& Stress

People,
Places, Things

HOW?

Electrodermal,
Heart Rate,
GPS,
Accelerometer,
Microphone

Electrodermal,
Heart Rate,
Blood Pressure,
Temperature

Heart Rate,
Blood Pressure,
Temperature,
GPS,
Accelerometer

Electrodermal,
Heart Rate,
Blood Pressure,
Temperature,
Accelerometer

GPS,
Microphone

<https://doi.org/10.3389/fdgth.2021.662811>

<https://doi.org/10.1016/j.smhl.2018.09.002>

WHO?



Microsoft \$2.5tril



\$2.6tril



fitbit

\$1.9tril

empatica

\$7.8mil

senti

\$6.4mil

:) Affectiva

\$62.6mil



\$1.6bil

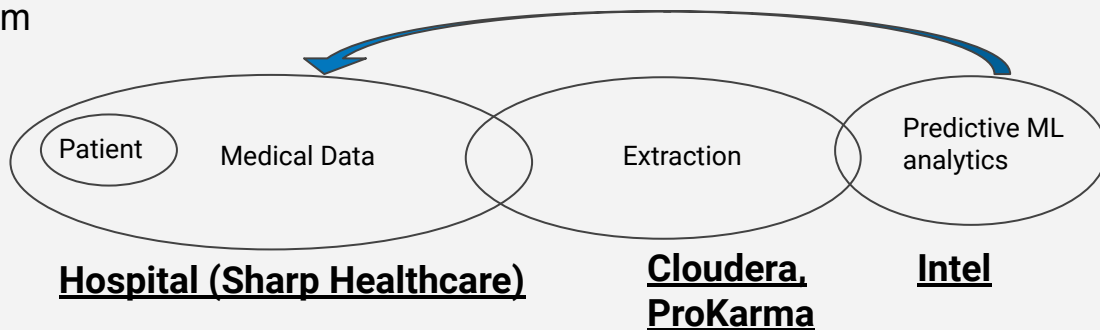
Healthcare: Big Data/ML

Improved patient outcome through intervention

Sharp Healthcare

PoC System

Rapid Response Healthcare Intervention



Results:

Pre-Fatality Detection

Accuracy: 80%

Detection: <1hour

Penn Medicine

Penn Signals

(based on Trusted Analytics Platform)

Sepsis Detection

Accuracy: 50% → 80%

Detection: 2hrs → 30hrs

Heart Failure Detection

Accuracy: 70-80% → 100%

Privacy Concerns

Headwind: No comprehensive privacy law in US

- **No singular law that covers the privacy of all types of data in US**

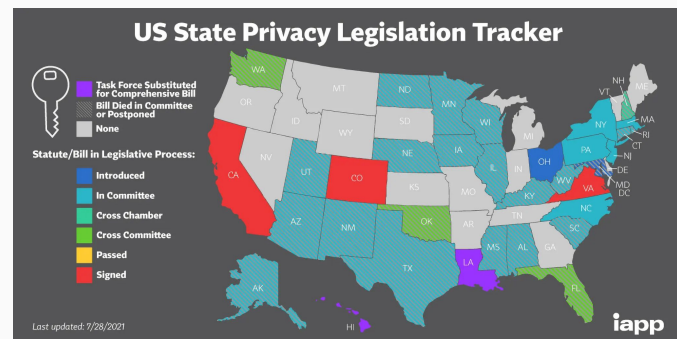
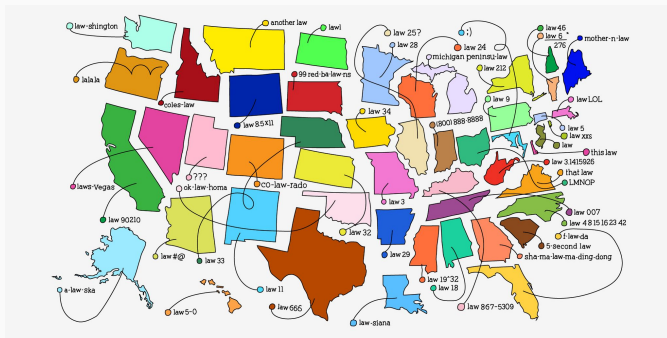
- HIPAA - The Health Insurance Portability and Accountability Act
- ECPA - Electronic Communications Privacy Act
- FCRA - Fair Credit Reporting Act
- FERPA - Family Educational Rights and Privacy Act
- GINA - The Genetic Information Nondiscrimination Act
- CMIA - Confidentiality of Medical Information Act
- COPPA - Children's Online Privacy Protection Rule

- **Only 3 states have comprehensive privacy laws**

- CCPA - California Consumer Privacy Act
- VCDPA - Virginia Consumer Data Protection Act
- ColoPA - Colorado Privacy Act

- **EU's comprehensive privacy law**

- GDPR - General Data Protection Regulation



Summary

Healthcare & Insurance:

Product: In-patient & out-patient care

Goals: Outcomes ↑, Costs ↓



KAISER PERMANENTE.

Software:

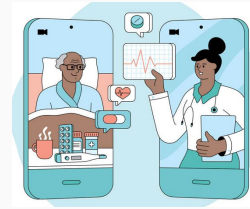
Product: Patient Logging & Behavior Management



FDA is authorizing
Apps as SaMD



App Makers are marketing
Telehealth & Analytics to
healthcare providers & insurance



Hardware:

Product: Medical wearable sensors

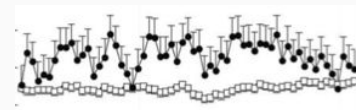
Growth: Overall wearable market & quality is rapidly improving



FDA approving
wearable sensors for
medical applications

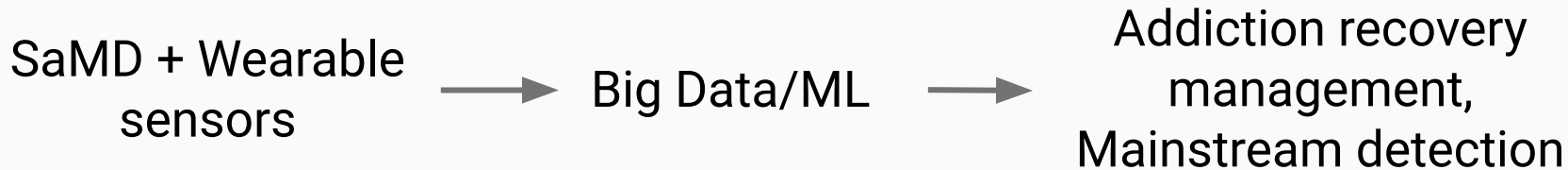


Device Makers developing & marketing **sensor data analytics services** to healthcare providers



What next?

Prediction



Opportunities:

- Healthcare providers (e.g. Kaiser) to acquire or partner with companies analyzing data to provide better SaMD to detect pre and post-relapse to reduce costs and reduce deaths
- Big tech such as Apple/Microsoft/Google/Intel to acquire wearable manufacturers/add EDA, temperature technology to better predict causes of substance abuse addiction

