# Innovative uses of technology for measuring outcomes in clinical trials
# Panel Comments

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# Background considerations

## What are some of the digital biomarker considerations with regards to validation and potential for product labeling?

- Like any measure, basic psychometrics and testing considerations such as
  - **Reliability**
  - **Validity**
  - **Practicality**
- **Data analytics, extraction,** and **integrity** processes
- Is the device measuring the construct that you think it is measuring?
- Consider translational (does it fit with animal models?)
- Validation and Certification of measures will be necessary for Regulators / Payers
  - EMA could request to issue a qualification opinion and then use your biomarker to enrich a population
  - These surrogate and secondary endpoint measures should be linked with primary or co-primary

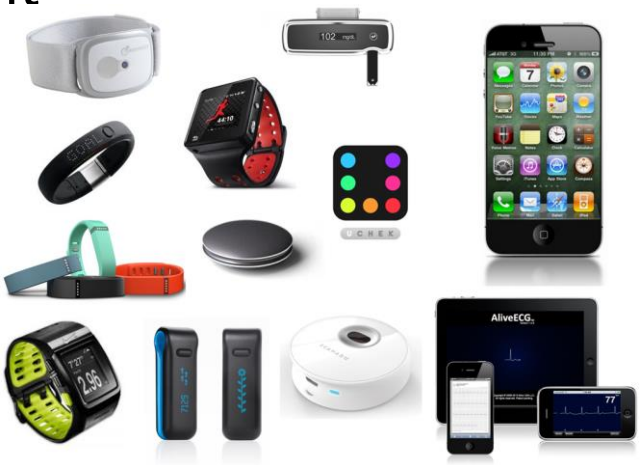
## Product Labeling Consideration

- Potential to replace Phase IV studies with patient centered outcomes (see regulatory / payer considerations above)
  - Example-Improves social activity in people with depression



# Digital Biomarkers Regulatory Comments (1 of 3)

Selecting the right device for the right endpoint




- Starts with the science
- Device Features
  - Form factor/Durability/Battery
- Connectivity
  - Wifi/Bluetooth
- Data and Metrics
  - Sensitive, Reliable, Clinical Relevance, Accuracy
- Scalability
  - Deployment ease across large populations and different countries
- Patient Experience
  - Usefulness/Burden/Adherence and technology bias

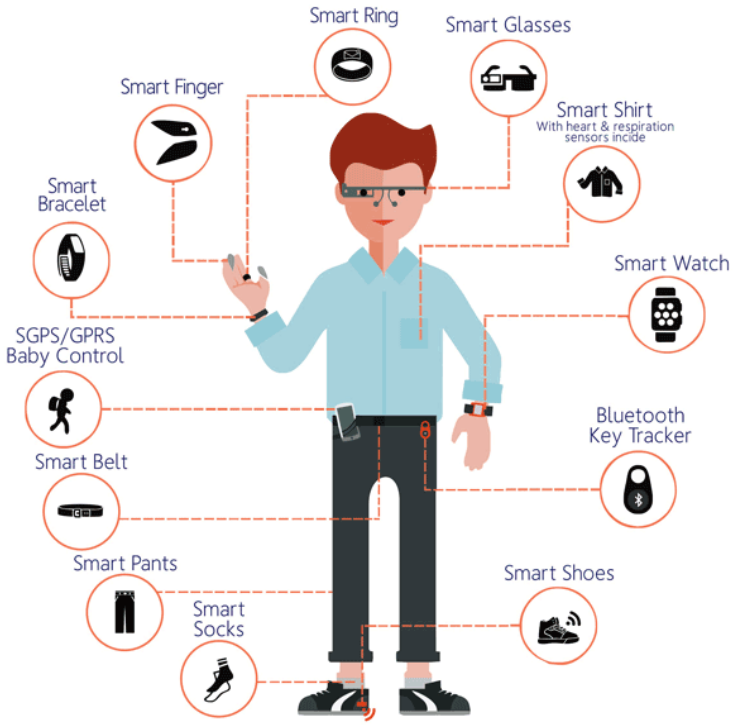
# Digital Biomarkers Regulatory Comments (2 of 3)

## Regulators and sponsors looking for:

- Better data capture
- Enhanced patient experience (automation)
- Efficient-Data structured for submission
- Real time transparency

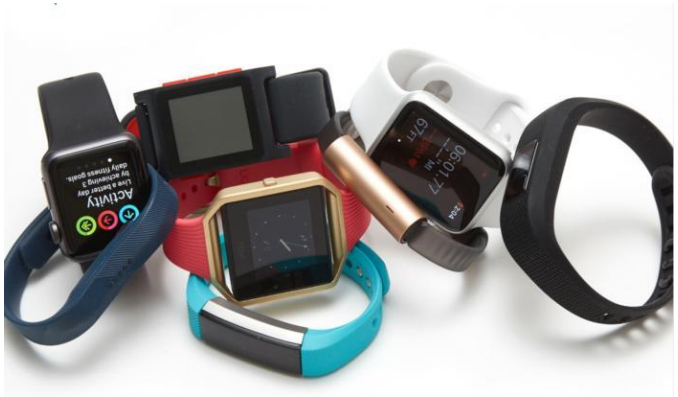
## Data Challenges

- Data volume-Sponsors not equipped to receive more data from one patient actigraphy than previous **entire** studies
- Continuous data-hard to determine a definec variable, or definite endpoint



# Digital Biomarkers Regulatory Comments (3 of 3)

- Biometrical subject authentication
- Management of exponential increase in volume of data collected
- Lack of common data standards
- Consumer and even FDA approved devices could be plagued with many data reliability issues / missing data
- Retention/adherence issues, subjects neglecting to wear/charge
- Subject Device training and correct use monitoring without overburdening the subject
- Support: Need to make sure solutions don't require the site personnel to be "tech people"
- Variability in home environments
- Rate of change in consumer technology
- Privacy, Legal



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# Reconciling Big Data and Privacy in Europe

## How good faith legal safeguards could *de facto* make Europe non competitive

- The new EU General Data Protection Regulation has entered into full force on May 25th, 2018
  - Driven by the principle of data minimisation
  - Privacy by design and default
  - Right to opt out
  - Informed consent
  - Data ownership – personal / public / private
  - Need access to a sufficient amount of "good quality data"



# Reconciling Big Data and Privacy in Europe

## How good faith legal safeguards could *de facto* make Europe non competitive

- The new EU General Data Protection Regulation has entered into full force on May 25th, 2018 but…
  - Driven by the principle of data minimisation (it will preclude machine learning)
  - Privacy by design and default (it will preclude predictive analytics)
  - Right to opt out (but how? )
  - Informed (really informed?) consent (impossible to predict to what I am giving consent to)
  - Data ownership – personal / public / private (issue is not on ownership but on access)
  - Need access to a sufficient amount of "good quality data" (indeed impossible with limits above)

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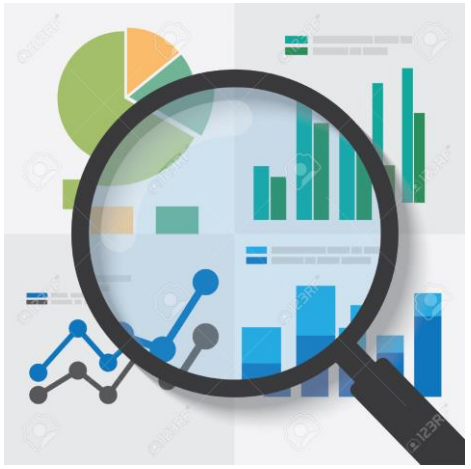
- EU Regulators / Payers will have these additional problems
- Not enough (sometime none) competence with in-house and hands-on skills
- Education of new types of assessors with very broad data science and life science knowledge.
- Inability to certify and validate different data sources to be integrated among them.
- Rule the emerging strong engagement by patients as data generators.



# Future insights and issues



**New Developments**

- Adoption of A.I.
- Machine Learning
- Integration of structured and unstructured data
- Applying an iterative approach
- Use real life certified database for HTA as well

**Potential Pitfalls**

- Junk in / Junk out
- Missing data
- Unrealistic values
- Not preparing the data for submission or clearly defining the objectives

**What we have vs. what is coming**

- Sensors for “activity” monitor (ok for now)
- Pattern recognition (pretty cool)
- Human to machine interface (very cool)