Virtual Journal club

Digital health technology derived measures: Biomarkers or clinical outcome assessments?

Thursday. August 24, 2023 11:00am ET
But first, housekeeping

• Please note: today’s session is being recorded
• To ask a question for discussion during Q&A, please:
  • Raise your virtual-hand; the moderator will ask you to unmute yourself
  • Type your question into the chat box
• Slides and recording will be available after today’s session
Why This Topic?

Digital health technology derived measures: Biomarkers or clinical outcome assessments?

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# Definitions

## Biomarker
- Indicator of normal biological processes, pathogenic processes, or biological responses to an exposure or intervention, including therapeutic interventions.
- May include molecular, histologic, radiographic, or physiologic characteristics.
- Not a measure of how an individual feels, functions, or survives.

## Digital Health Technologies
- Uses computing platforms, connectivity, software, and sensors for healthcare and related uses.
- Wide range of uses, from applications in general wellness to applications as a medical device.
- Technologies intended for use as a medical product, in a medical product, or as an adjunct to other medical products.
- May be used to develop or study medical products.

## Clinical Outcome Assessment
- Describes or reflects how an individual feels, functions, or survives.
- Can be made through report by:
  - Clinician
  - Patient
  - Non-clinician observer
  - Performance-based assessment
Biomarker or Clinical Outcome Assessment?

**COA**
- **What is measured:** how patient feels, functions, or survives; must include an aspect of health meaningful to patients
- **How it is measured:** by means of patient, clinician, observer rating, or performing a defined task
- **How it is validated:** establishing content validity, test-retest reliability, sensitivity to change, usability

**Biomarker**
- **What is measured:** normal physiology, pathology or response to intervention
- **How it is measured:** by means of laboratory techniques, electrophysiology methods or imaging
- **How it is validated:** establishing method performance characteristics and a relationship with an outcome of interest

**DHT-derived measure**
- **What is measured:** physiology, symptoms, function, physical activity, or response to intervention
- **How it is measured:** objectively by means of sensors and data processing algorithms
- **How it is validated:** establishing method performance characteristics, content validity, test-retest reliability, sensitivity to change, usability, and relationship with an outcome of interest
## What Is Confusing?

<table>
<thead>
<tr>
<th>DHT-derived measures can be classified as either biomarkers or CAOs</th>
<th>Example: Reduction in mobility in congestive heart failure predictive of mortality</th>
<th>Digital measures are sometimes categorized as COAs BUT may not be feasible to establish meaningfulness to patients</th>
<th>Uncertainty for drug developers on regulatory strategy</th>
<th>Terminology varies across geography</th>
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</thead>
<tbody>
<tr>
<td>Biomarkers: blood oxygen saturation by pulse oximetry</td>
<td>Biomarker supporting surrogate endpoint OR COA assessing patient capacity</td>
<td>Analogie: Other imaging and blood-based biomarkers are used to support surrogate endpoints and yet carry little meaning to patients</td>
<td>Uncertain requirements for evidentiary submission packages Validation studies for biomarker vs COA differs</td>
<td>Challenging for global studies Digital mobility outcome measures considered as biomarkers by EMA but COAs for FDA</td>
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</table>
## Examples

### Finger tapping in Parkinson's disease

- Measuring variability of finger tapping to assess bradykinesia in Parkinson's disease
  
  **Biomarker:** measuring variability of finger tapping to assess bradykinesia in Parkinson’s disease

  **COA:** tasking a study participant to complete a structured finger tapping exercise on the smartphone to assess hand function

### Nocturnal scratch in patients with clinician diagnosed atopic dermatitis

- **Biomarker:**
  - Digital biomarker measuring the change in selected disease component - scratching - as a response to therapeutic intervention
  - Used as pharmacodynamics endpoint, baseline screening tool, patient phenotyping, pathophysiology evaluation, etc.

- **COA:**
  - A digital health technology (DHT) clinical outcome assessment (COA)
  - Used as an efficacy endpoint in drug development clinical trials of new medical products, supporting label claims of new treatments

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[https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8956713/](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8956713/)  
Call for Action

- Recognize unique opportunities offered by DHTs in drug development and identify the differences of DHT-derived measures that will require adjusting existing definitions.

- Create definitions for DHT-derived tools and derived measures with specific examples of how these tools can be leveraged in drug development.

- Define specific requirements for evidentiary criteria to declare DHT-based tools to be fit for purpose according to defined categories.
Q&A
Navigating Reimbursement for Virtual First Care (V1C)

Wednesday, September 6, 2023 | 12pm-1pm ET

Abby Sugg | Moderator
Program Lead
Digital Medicine Society (DiMe)

Dr. Zeke Silva
Radiologist & Chair of the American Medical Association Speciality Relative Value Scale Update Committee (RUC)
American Medical Association

Lucia Savage
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Don Jones
IMPACT Co-founder & Chair of Cardiff Ocean Group
Digital Medicine Society (DiMe)
Virtual Journal Club

Nocturnal scratch: A study bringing patient input into development of novel digital measures

September 20, 2023, 11 am ET
THANK YOU