FDA MyStudies App

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Disclosure and Disclaimer

• David Martin received funding from the Patient Centered Outcomes Research Trust Fund to develop the FDA My Studies Mobile App
• No conflicts of interest to disclose
• The views expressed are those of the author and should not be construed as FDA’s views or policies
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Overview

• Opportunities for Mobile Technology
• Description of FDA My Studies system
• FDA Guidance related to informed consent, authenticity, integrity, and confidentiality
• Implications of the FDA My Studies pilot
• Access to FDA My Studies documentation and code
• Next steps
Two big opportunities

• **Patient-Centric Interaction**
  – Direct capture of the patient perspective
  – 24 hour convenience
  – Electronic transmission enables data to be captured from geographically dispersed patients

• **Unobtrusive measurement**
  – Biosensors can be worn or attached to patient
  – Continuous monitoring for rare events (e.g., seizures, arrhythmias)
  – Capture real life situations (stress, sleep, exercise, eating)
Commitments to Evaluate RWE

21st Century Cures

“FDA shall establish a program to evaluate the potential use of real world evidence (RWE) to support:

• A new indication for an approved drug
• Post-approval study requirements

- **Real-World Data (RWD)** are data relating to patient health status and/or the delivery of health care routinely collected from a variety of sources
- **Real-World Evidence (RWE)** is the clinical evidence regarding the usage and potential benefits or risks of a medical product derived from analysis of RWD

RWD include data derived from *electronic health records (EHRs)*, *claims and billing data*, data from product and disease *registries*, *patient-generated data* including in home-use settings, and data gathered from other sources that can inform on health status, such as mobile devices.
## Endpoints in FDA Registrational trials 2007-2015

<table>
<thead>
<tr>
<th>Type of Endpoint</th>
<th>% of NDA</th>
<th>Examples of Endpoints Measured</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chemistry data</td>
<td>11</td>
<td>HBA1c, pregnancy test, GFR</td>
</tr>
<tr>
<td>Hematology</td>
<td>6</td>
<td>Severe neutropenia</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Apheresis yield &gt; 5 million CD34+ cells/kg</td>
</tr>
<tr>
<td>Pathology</td>
<td>2</td>
<td>Increase/decrease of parabasal cells; biopsy proven acute rejection, clearing of anterior chamber cells</td>
</tr>
<tr>
<td>Microbiology</td>
<td>6</td>
<td>Sustained virological response, plasma viral load, conversion to negative sputum</td>
</tr>
<tr>
<td>Imaging +/- (survival, clinical signs)</td>
<td>17</td>
<td>Bone mineral density; vertebral fractures, spleen volume, progression free survival</td>
</tr>
<tr>
<td>Physiological/functional measurement</td>
<td>9</td>
<td>6 minute walk, normal sinus rhythm, FEV1, sleep studies</td>
</tr>
<tr>
<td>Clinical event/clinical sign</td>
<td>19</td>
<td>Death, hospitalization, MACE, MS relapse, Lice free head</td>
</tr>
<tr>
<td>CRO/PRO</td>
<td>30</td>
<td>Toronto western spasmodic torticollis rating scale, Hamilton depression rating scale, Rheumatology scale ankylosing spondylitis scale, psoriasis severity index, seizures, sleep, prostate symptom score</td>
</tr>
</tbody>
</table>
FDA My Studies

- **Mobile App**
  - Standard frameworks - ResearchKit (iOS), ResearchStack (Android)
  - Gateway capability
- **Web-based configuration portal**
- **Secure Storage Environment**
  - FISMA complaint
  - Partitioned for distributed research
  - Responses can be downloaded in broadly compatible formats (e.g., for use in SAS, Excel, etc.)
Reusable Infrastructure

- Configure Study Elements (including questions and active tasks)
  - Custom recurrence and frequency
  - Logical branching
- Create and Manage Resources and Notifications
  - Flexible notifications
  - Study Dashboards
  - Create patient enrollment tokens
Informed Consent

- Can be obtained from patient remotely
- Method needed to ensure the person signing the consent is the person in the study
- May use audio visual presentation
- Must have a process to address patient’s questions
- Must provide a suitable record to patient
- FDA needs to be able to inspect it
Enrollment and Consent

- Pre-select a cohort from electronic health data
- Recruit and distribute enrollment tokens for pre-selected cohorts
- Participants download the app in iOS or Android app stores
- Participants review eligibility information and provide informed consent through the app

www.fda.gov
Engagement

- Participants respond when they choose within the study schedule
- Responses are securely transmitted to the Response Server
- Dashboard displays progress
- Configurable notifications
21 CFR Part 11 and Mobile Technology

- **Goals:** Ensure authenticity, integrity, and confidentiality
- **Refers to:** Portable electronic technology used in clinical investigations that allows for off-site and remote data capture from study participants
  - Includes mobile platforms, mobile applications, wearable biosensors and other remote and ingestible sensors, and other portable and implantable electronic devices
- **The recommendations apply to:** Technology that is provided by the sponsor or owned by the study participant
Audit Trails

• The mobile technology should record the date and time that the data are captured and this information should be transmitted or recorded in the durable database.

• The first durable database should capture:
  – Date and time that the data enter the durable database
  – Data originator for each data element
    • Patient
    • Mobile Technology (e.g., biosensor)
    • EHR

• An audit trail should track modifications to the data and include data element identifiers that reflect the date, time, and data originator and the reason for the change:
  – Modified or corrected data should not obscure previous entries.
Pilot Study

• Kaiser Permanente Washington
  – About 680,000 members and 6,000 births per year
  – Participant in Sentinel and PCORnet

• 1,070 randomly selected pregnant women (based on electronic health record data) received an invitation letter with the participant enrollment token
  – 64 consented to participate in the study
    • 4% response for mail-only group and 8% response for phone call follow-up group
    • Compares to 1% “activation rate” noted in another Sentinel Initiative (FDA-Catalyst) study involving mailings from data partners and no financial incentives

• Patients contributed to questionnaire design
FDA My Studies Pilot: 24 hour Engagement Pattern
Implications of My Studies

• Mobile technology can expand the depth and diversity of pharmacoepidemiology data
  • Women provided sensitive information including continued alcohol, smoking, and illicit drug use during pregnancy
  • Aggregate use reported through app vs. secondary electronic health data
    • OTC: 13x
    • Rx: 60%
    • Women provided reasons for discontinuation
• Patient-centric interaction can present challenges
  • One erroneous free text medication input
  • Four live births not reported
Implications of My Studies

• Mobile Technology can operate successfully within a distributed clinical research environment
  • Linking data from mobile technology to distributed pharmacoepidemiology data or trial data is feasible
  • My Studies App and data storage environment can support a 21 CFR Part 11 compliant study
  • Institutional review boards willing to review
• Recruitment strategies and incentives remain important
• Patients should be involved in application development as well as questionnaire design
• Open source and reusable infrastructure reduces “up front” investment but may impose constraints
FDA MyStudies: now open source

https://www.fda.gov/NewsEvents/Newsroom/FDAInBrief/ucm625228.htm
https://www.fda.gov/Drugs/ScienceResearch/ucm624785.htm
https://github.com/PopMedNet-Team/FDA-My-Studies-Mobile-Application-System
Links to technical documents

MyStudies App Technical Documents

- Open Source Code and Technical Documentation for the FDA MyStudies App on GitHub
- MyStudies Mobile App Quick Overview for Research
- The FDA MyStudies App: A Patient Centered Outcomes Research Trust Fund Enabler For Distributed Clinical Trials And Real World Evidence Studies
- Appendices

Upcoming Releases

Additional open source code built on the Apple ResearchKit (iOS) framework and the ResearchStack framework for Google’s Android operating system will be released over the next several calendar quarters. These enhancements will simplify configuration for researchers and improve the experience for participants. Additional details can be found in the Mobile App Quick Overview for Research document. Please see the Sentinel website for more information on the “FDA-Catalyst MyStudies App Alignment with Pragmatic Trials and/or Registries” project.
Quick overview and report

Mobile App Quick Overview for Research

Architecture

- Mobile App
  - Standard frameworks - ResearchKit (iOS), ResearchStack (Android)
  - Optional gateway capability

- Web-based configuration portal
  - Configure Study Elements (including questions and active tasks)
    - Custom recurrence and frequency
    - Logical branching
  - Create and Manage Resources and Notifications
    - Flexible notifications
    - Study Dashboards
  - Create patient enrolment tokens

THE FDA MYSTUDIES APP: PATIENT CENTERED OUTCOMES RESEARCH TRUST FUND ENABLER FOR DISTRIBUTED CLINICAL TRIALS AND REAL WORLD EVIDENCE STUDIES

COLLECTION OF PATIENT-PROVIDED INFORMATION THROUGH A MOBILE DEVICE APPLICATION FOR USE IN COMPARATIVE EFFECTIVENESS AND DRUG SAFETY RESEARCH

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The Sentinel System is sponsored by the U.S. Food and Drug Administration (FDA) to proactively monitor the safety of FDA-regulated medical products and complements other existing FDA safety surveillance capabilities. The Sentinel System is one piece of FDA’s Sentinel Initiative, a long-term, multi-faceted effort to develop a national electronic system. Sentinel Collaborators include Data and Academic Partners that provide access to healthcare data and ongoing scientific, technical, methodological, and organizational expertise. The Sentinel Coordinating Center is funded by the FDA through the Department of Health and Human Services (HHS) Contract number HHSF2232014000030. This project was funded by the Office of the Secretary PCORI under Interagency Agreement #750115PE060034 with the FDA.
GitHub repository

This repository contains all the necessary code and documentation for running the FDA My Studies mobile application, web configuration portal, and storage environment.
Next Steps

• Learn from experience supporting a registry and clinical trial
• Public meeting or webinar oriented at end users and developers
• Updates to open source FDA MyStudies app
Questions/ Comments

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