Advancing the Appropriate Use of Mobile Clinical Trials: The Clinical Trials Transformation Initiative

Jennifer Goldsack, MChem, MA, MBA, CPHQ
Clinical Project Manager, CTTI
Agenda

- Introduction to CTTI
- CTTI Mobile Clinical Trials Program Overview
- CTTI Mobile Clinical Trials Projects
  - Use of Mobile Devices
  - Novel Endpoints
  - Legal and Regulatory Issues
  - Stakeholder Perceptions
Introduction to CTTI
CTTI Overview

To develop and drive adoption of practices that will increase the quality and efficiency of clinical trials

Public-Private Partnership
Co-Founded by FDA and Duke
involving all stakeholders
80+ members
<table>
<thead>
<tr>
<th>Project Portfolio</th>
<th>Systematic approach to evidence generation including use of non-traditional CT data sources &amp; technical innovations</th>
<th>Patients as equal partners across the R&amp;D continuum</th>
<th>CTs designed with a focus on efficiency &amp; quality</th>
<th>Trials that address emerging public health concerns</th>
<th>Safe &amp; ethical trials that are streamlined</th>
</tr>
</thead>
<tbody>
<tr>
<td>Project Recommendations/Findings Complete</td>
<td>Large simple trials</td>
<td>GCP training Monitoring Quality by Design Recruitment Site metrics</td>
<td>Antibiotic Drug Development (ABDD): Streamlining HABP/VABP trials Opioid</td>
<td>Central IRB (2) DMCs Informed Consent Safety reporting (3)</td>
<td></td>
</tr>
<tr>
<td>Active Projects</td>
<td>Registries State of clinical trials Mobile in Clinical Trials Program: Mobile Devices Legal &amp; Reg Novel endpoints Stakeholders</td>
<td>Patient Groups &amp; Clinical Trials Investigator turnover GCP follow-on (Qualified investigators)</td>
<td>ABDD: Pediatric clinical trials Pilot studies Unmet need</td>
<td>Pregnancy Testing</td>
<td></td>
</tr>
<tr>
<td>Completed Collaborations</td>
<td>Uses of electronic healthcare data</td>
<td>Clinical trial survey CV endpoints Investigator training course Patient engagement survey</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Active Collaborations</td>
<td>Supporting IMPACT-AFib</td>
<td></td>
<td></td>
<td>ABDD PTN</td>
<td></td>
</tr>
</tbody>
</table>
Mobile Clinical Trials Program Overview
Mobile Clinical Trials (MCT) Program

PURPOSE:
Develop evidence-based recommendations that affect the widespread adoption and use of mobile technology in clinical trials

ANTICIPATED IMPACT:
Increase the number of clinical trials appropriately leveraging mobile technology

4 PROJECTS

- Legal & Regulatory Issues
- Novel Endpoints
- Mobile Devices
- Stakeholder Perceptions

*Scope: FDA-regulated clinical trials after the time of initial research volunteer consent*
Scientific and Technological Issues Surrounding the Use of Mobile Devices in Clinical Trials
# Project Team

<table>
<thead>
<tr>
<th>Team Leaders</th>
<th>Team Members</th>
<th>Project Manager</th>
</tr>
</thead>
<tbody>
<tr>
<td>Marissa Bolognese (The Life Raft Group)</td>
<td>Aiden Doherty (University of Oxford)</td>
<td>Jen Goldsack (CTTI)</td>
</tr>
<tr>
<td>Phil Coran (Medidata)</td>
<td>Ashish Naryan (Northwell Health)</td>
<td></td>
</tr>
<tr>
<td>Ray Dorsey (URMC)</td>
<td>Jonathan Helfgott (Stage 2 Innovations)</td>
<td></td>
</tr>
<tr>
<td>Cheryl Grandinetti (FDA)</td>
<td>Jane Shen (PMG Research)</td>
<td></td>
</tr>
<tr>
<td>Seleen Ong (Pfizer)</td>
<td>Matt Kirchoff (NIH)</td>
<td></td>
</tr>
<tr>
<td>Kaveeta Vasisht (FDA)</td>
<td>Chris Miller (AstraZeneca)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Tom Switzer (Genentech)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Adam Amdur (Sleep Apnea Assoc)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Dharmesh Patel (FDA)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Phillip Kronstein (FDA)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Barry Peterson (Philips)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Drew Schiller (Validic)</td>
<td></td>
</tr>
</tbody>
</table>
**Project Purpose:**
- Propose recommendations that address the **scientific and technological challenges** related to applying mobile devices in clinical trials.

**Project Objectives:**
- Identify solutions to the **data** challenges associated with using mobile devices in clinical trials.
- Identify and describe the scientific and technological considerations associated with managing mobile devices for use in clinical trials and **develop guiding principles** to promote their inclusion.
Issues are Evidence Based

CTTI Expert Meeting (November 2015)

Analysis of response to FDA public docket on “Using Technologies and Innovative Methods to Conduct FDA-Regulated Clinical Investigations of Investigational Drugs” (December 2015)

Review of pertinent guidance documents (“Old made new”)
- Part 11, Electronic Records; Electronic Signatures — Scope and Application
- General Principles of Software Validation
- eSource Data in Clinical Investigations
- Critical Path Innovation Meetings
- Use of Electronic Informed Consent in Clinical Investigations
- Computerized Systems Used in Clinical Investigations
- Mobile Medical Applications
## Scientific and Technological Issues Surrounding the Use of Mobile Devices in Clinical Trials

### Topics and issues we are addressing in this project

<table>
<thead>
<tr>
<th>Data Challenges</th>
<th>Scientific Considerations</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Data origins &amp; source data</td>
<td>• Providing real-time data to study participants</td>
</tr>
<tr>
<td>• Data integrity</td>
<td>• Monitoring outcomes</td>
</tr>
<tr>
<td>• Data collection</td>
<td>• Real time safety signals</td>
</tr>
<tr>
<td>• Data attribution</td>
<td></td>
</tr>
<tr>
<td>• Study Monitoring</td>
<td></td>
</tr>
<tr>
<td>• Data security</td>
<td></td>
</tr>
<tr>
<td>• Data analysis</td>
<td></td>
</tr>
<tr>
<td>• Data validation</td>
<td></td>
</tr>
<tr>
<td>• Audit trail</td>
<td></td>
</tr>
<tr>
<td>• Data reproducibility</td>
<td></td>
</tr>
</tbody>
</table>

### Technological Considerations

- Device validation
- Calibration
- Device management
- BYOD
- Device failure
- Device reuse
Primary Products

- Specific recommendations on how to effectively use mobile devices in clinical trials
- Tool kits
  - Guidance for selection of appropriate devices
    - Primarily addressing ‘technological considerations’
  - A framework of pros and cons for investigators / sponsors to consider during protocol design when incorporating mobile devices into regulatory trials
    - Primarily addressing ‘scientific considerations’

Secondary Products

- Manuscripts
- Conference Presentations
- Webinars
Timeline of upcoming activities

Complete Phase I evidence gathering – Q4 2016
  ▪ Interviews & analysis

Complete Phase II of evidence gathering – Q1 2017
  ▪ Interviews & analysis

Expert meeting Q2 2017

Finalize recommendations and other products Q3 2017
Developing Novel Endpoints Generated by Mobile Technology for Use in Clinical Trials
## Project Team

<table>
<thead>
<tr>
<th>Team Leaders</th>
<th>Team Members</th>
<th>Project Manager</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lauren Bataille (MJFF)</td>
<td>Stephen Friend (Apple)</td>
<td>Jen Goldsack (CTTI)</td>
</tr>
<tr>
<td>Rob DiCicco (GSK)</td>
<td>Ashish Naryan (Northwell)</td>
<td></td>
</tr>
<tr>
<td>Cheryl Grandinetti (FDA)</td>
<td>Elektra Papodopoulous (FDA)</td>
<td></td>
</tr>
<tr>
<td>Will Herrington (University of Oxford)</td>
<td>Theresa Strong (FPWR)</td>
<td></td>
</tr>
<tr>
<td>Martin Landry (University of Oxford)</td>
<td>Komathi Stem (ReThynk Consulting/Genentech)</td>
<td></td>
</tr>
<tr>
<td>Kaveeta Vasisht (FDA)</td>
<td>Ken Skodacek (FDA)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Nirav 'Rav' Sheth (MC10)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Andrew Trister (Sage Bionetworks)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Marc Walton (Janssen)</td>
<td></td>
</tr>
</tbody>
</table>

CTTI Executive Committee Champion

John Alexander (Duke)
Purpose:
- This project aims to issue recommendations that clarify the pathway for developing novel endpoints*, generated using mobile technology, for use in clinical trials.

Objective:
- Describe best practices for developing novel endpoints, generated using mobile technology, for use in clinical trials.

* We have defined novel endpoints as either 1) new endpoints that are not currently used, or 2) existing endpoints that can now be measured in new and possibly better ways using mobile technology.
Our Approach

Determine Information Needed from Existing Case Studies (Extraction Tool)
Determine Search Terms for Identifying Case Studies
Create a "long list" of possible novel endpoints that we could write use cases for
Determine criteria and weightings to use to select endpoints for use cases

"Quick Search" of case studies to identify which novel endpoints have already been studied to some degree

Systematic Review of Existing Case Studies

Publication of Systematic Review

Use Case Selection (using Pugh Matrix tool)

Publication of conceptual framework for selecting novel endpoints for inclusion in clinical studies

Use Case #1
Use Case #2
Use Case #3
Use Case #4

Recommendations

Publication(s) of Use Cases

USE CASES:
1. Physical activity and gait / Parkinson’s disease / accelerometer
2. Physical activity / heart failure / accelerometer
3. Blood sugar level / diabetes / CGM
4. Physical activity / muscular dystrophy / accelerometer
Upcoming Milestones

- Systematic review of and data extraction from existing use cases is underway
  - Expected completion - Q4 2016
- Expert meeting - Q3 2016
- Completion of use cases - Q4 2016
- Finalize recommendations and other products - Q1 2017
Legal and Regulatory Issues Affecting the Adoption of Mobile Clinical Trials
# Project Team

<table>
<thead>
<tr>
<th>Team Leaders</th>
<th>Team Members</th>
<th>Project Manager</th>
</tr>
</thead>
<tbody>
<tr>
<td>Linda Coleman (Yale University)</td>
<td>David Babanian (Quorum Review)</td>
<td>Gerrit Hamre</td>
</tr>
<tr>
<td>Gary Grabow (Genentech)</td>
<td>Mark Borigini (FDA CDER)</td>
<td>(CTTI)</td>
</tr>
<tr>
<td>Jan Hewitt (FDA CDER)</td>
<td>Paul Conway (AAKP)</td>
<td></td>
</tr>
<tr>
<td>Barak Richman (Duke University)</td>
<td>Kristin Dolinski (PhRMA)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Molly Flannery (FDA CDER)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Amy Hummel (Alexion)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Gracie Lieberman (Genentech)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Leanne Madre (CTTI)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Scott McGooohan (BIO)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Kristen Miller (FDA)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Nicole Miskel (Eli Lilly)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Laura Podolsky (Science 37)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Vaishali Popat (FDA CDER)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Ken Skodacek (FDA CDRH)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Marissa Stroo (Duke University)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Evan Wearne (FDA/CDER)</td>
<td></td>
</tr>
</tbody>
</table>
Legal and Regulatory Issues
Project Purpose and Objectives

**Purpose:**
- The project aims to propose recommendations to overcome the legal and regulatory barriers that inhibit widespread use of mobile technology in clinical trials

**Objectives:**
- Catalog and summarize laws, regulations, and associated organizations that affect the implementation of mobile clinical trials
- Identify perceived and actual legal and regulatory barriers to conducting mobile clinical trials
- Identify opportunities to clarify and inform policies that affect the implementation of mobile clinical trials
Legal and Regulatory Issues

Seven key areas of consideration

- Health Authority Receptivity/Readiness**
- Good Clinical Practice
- Institutional Review Boards
- Privacy/Confidentiality
- Reimbursement
- Shipping and Receiving of Investigational Agents
- Telemedicine**
Upcoming Milestones

- Interviews Step One (Sponsors) – Q4 2016
- Interviews Step Two (FDA, IRBs, GCP Monitors, Associations, etc.) – Q1 2017
- Analysis of findings – Q1 2017
- Expert Meeting – Q2 2017
- Catalogue Summarizing Laws/Regs/Associations – Q3 2017
- Recommendations – Q3 2017
Stakeholder Perceptions
## Project Team

<table>
<thead>
<tr>
<th>Team Leaders</th>
<th>Team Members</th>
<th>Project Manager</th>
</tr>
</thead>
</table>
| Cynthia Geoghegan (Patient Advocate)  
Steve Morin (FDA/CDER)  
Virginia Nido (Genentech) | Maria Ali (George Institute)  
Ricky Bloomfield (Duke)  
David Borasky (WIRB Copernicus Group)  
David Brennan (Medstar Research Institute)  
Terri Hinkley (ACRP)  
Les Jordan (Target Health)  
Hassan Kadhim (Boehringer Ingelheim)  
Amanda Niskar (Arthritis Foundation)  
Ido Paz-Priel (Genentech)  
Bill Riley (NIH/OD /OBSSR)  
Ken Skodacek (FDA/CDRH)  
Junyang Wang (FDA/PASE) | Zach Hallinan (CTTI) |
Project Purpose and Objectives

**Purpose:**
- This project will issue recommendations to overcome barriers on the use of mobile technology in clinical trials *as perceived by two key stakeholder groups, potential participants and community providers.*

**Objectives:**
- Identify the concerns of key stakeholders when using mobile technology to collect and share personal data in clinical trials and how these concerns can be addressed.
- Determine key stakeholders’ familiarity of and ease with using technology likely to be used in clinical trials.
- Describe expectations for the ongoing provision of personal study data collected using mobile technology to study participants during clinical trial implementation.
- Identify key stakeholders’ perceptions of the benefits of using mobile technology in clinical trials.
Methodology

Patient survey following a scenario-based approach, and targeted at 3-5 therapeutic areas. Objectives include:

- Determine patients’ familiarity of and ease with using mobile technologies in general and with mobile technologies likely to be used in clinical trials.
- Identify perceived benefits and concerns of using mobile technologies to collect and share personal data in clinical trials.
- Identify preferred and undesirable attributes of mobile technologies and with how mobile technologies are used in clinical trials.

Survey of community providers planned but not yet initiated.

Additional qualitative research may be considered based on findings of surveys.
Upcoming Milestones

- Survey development and data collection through Q2 2017
- Analyze/discuss survey results, consider additional info gaps – Q2-Q3 2017
- Expert Meeting – Q3 August 2017
- Recommendations – Q4 September 2017
Thank you.

Jen Goldsack
Jennifer.goldsack@duke.edu