The Role of Medical Research in the Learning Health System...or Vice Versa

Rebecca D. Kush, PhD; President and CEO, CDISC

Joseph H. Kanter Family Foundation & Kanter Foundation Annual Meeting

24 March 2016
Miami, Florida
Information from healthcare (private, aggregated) to enable research

**Healthcare**
- Quality healthcare
- Informed decisions
- Personalized medicine
- Patient safety and privacy
- Public health
- Improved therapies
- Efficiencies/reduced costs

**Research**
- Discovery of new therapies
- Understanding diseases
- Comparing effectiveness (CER)
- Populating registries
- Assessing efficacy
- Monitoring safety
- Understanding responses (genomics, biomarkers)
- Public health
- Post-marketing surveillance

**Currently Inefficient cycle**

Research findings to inform healthcare decisions
We should make sure we are using the information wisely, that it is accurate and we can find it. We owe it to the patients who agree to participate in research studies and share their data.

“One has to simply examine the phenomenon taking place in the various ‘PatientsLikeMe’ web-based communities to gain a glimpse of what a world of shared patient data looks like. Daily entries by tens of thousands of individuals indicate the drive some people possess for sharing data with others.”

Terry, S.F., Terry, P.F. “Power to the People: Participant Ownership of Clinical Trial Data” Science Translational Medicine, Feb 2011
Data Exchange Among Physicians – NOT ‘Interoperable’

Furukawa M. et al  Health Affairs, Aug, 2014
THIS IS THE BLACK HOLE OF CLINICAL RESEARCH.

Billions of dollars are spent on clinical research, but when data isn’t shared, results get buried. Along with patients needing cures.

There’s a Problem We Need to Talk About.

www.unlockcures.org
THE CURRENT RESEARCH LANDSCAPE

Data Sharing is a 'hot topic'. (IOM, NEJM, WellcomeTrust)

• Data liquidity, transparency, data liberation, disclosure
• Privacy, security, protection, portable consent
• Pseudonymization, anonymization, de-identifiction
• Meta-analysis, pooling of data, risk of being 'blind-sided', 'rogue analyses', repeatability of published results, 'open collaborative science', CER, summary data vs. raw data, clean vs. 'scruffy' data, data mining, 'BIG data'
• Incentives/dis-incentives, especially for researchers
• Variability in interpretation of 'Data Sharing'

EMA informed that "Clinical trial data is not commercial confidential information."

Rarely are data standards mentioned...

Innovative Medicines Initiative and CDISC

Published 5 June 2014

The NEW ENGLAND JOURNAL of MEDICINE

Fostering Responsible Data Sharing through Standards
Rebecca Kush, Ph.D., and Michel Goldman, M.D., Ph.D.

Children with muscular dystrophy and their families make sacrifices to engage in clinical research studies, providing valuable data they expect will contribute to the discovery of a cure, although they know it may not be found in time to help them. This message was emphasized at a recent meeting organized by the Institute of Medicine. Treatment of Alzheimer's disease have led several companies to begin collaboratively developing innovative study designs requiring extensive data sharing.

Unfortunately, the diverse ways in which data are collected and reported in clinical studies make it difficult or impossible to query across data sets, pool and share data, or integrate data for metadata, such confusion is inevitable. Units and other metadata are critical in medical research as well. Standard data and metadata formats are required for efficient aggregation of patient-level data, trustworthy statistical analyses, and accurately informed clinical decisions. When such standards are not implemented by all parties at the
### Variability...

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CDISC PROVIDES A COMMON CLINICAL DATA LANGUAGE THAT ALLOWS US TO SHARE AND COMPARE DATA.

WITH MORE MINDS AROUND THE CHALLENGES, PROBLEMS GET SOLVED FASTER AND THE PURSUIT OF CURES IS ACCELERATED.
CDISC is about “SUPER Data”

- Suitable
- Useful
- Private
- Exchangeable
- Re-usable

“BIG Data”

Efficiency is Optimized by Using Standards from the Start
What is CDISC?
Clinical Data Interchange Standards Consortium

- Global Standards Development Organization (SDO)
- Founded in 1997 (all volunteers)
- Incorporated in 2000 as a non-profit organization
- Nearly 400 member organizations
- Strength through Collaboration
- 90 countries; Coordinating Committees in Europe, Japan, China, Asia-Pacific; 20 user networks
- Robust education program
- CDISC Standards
  - Streamline research processes and enable data sharing/aggregation
  - Support all types of research from protocol through analysis and reporting
  - Include link to healthcare through EHRs
The CDISC Vision: informing patient care and safety through higher quality medical research.

Mission: To develop and support global, platform-independent data standards that enable information system interoperability to improve medical research and related areas of healthcare.

Standards bring order to complexity.
CDISC Healthcare Link
Goal: Optimize the Process

Healthcare Delivery

(e)Source
Documents EHR

(e)CRFs

Clinical Research

~1997
Synergistic Standards Available

Healthcare Delivery

Medical Research

Integration Profiles (e.g. RFD)

eCRFs

eSource Documents EHR

eArchive at Clinical Site
Swivel Chair
Interoperability
EHR to Electronic Data Capture (CDASH) with IHE Retrieve Form for Data Capture (RFD)

See the keyCRF video by Landen Bain on the CDISC Website.
COLLABORATE

“Perfect as the wing of a bird may be, it will never enable the bird to fly if unsupported by the air. Facts are the air of science. Without them a man of science can never rise.”

—Ivan Pavlov, Nobel Prize Winner in Physiology or Medicine, 1904
ASTER (AE Reporting from EHRs)
30 Ambulatory care physicians at Harvard and Brigham and Women’s with Pfizer, CDISC, CRIX
Nov 08 – Jun 09, > 200 Reports Sent to FDA

Physician Reporting:
* 91% of participating physicians had submitted no ADE reports in the prior year
* During the study, participants reported an average of approximately 5 reports in a 3 month time period
* All participants reported at least 1 AD
* Process: Time to report decreased from ~35 min to < 1 min

Source: Michael Ibara, Pfizer
09 June 2010
EMA/INS/GCP/454280/2010
GCP Inspectors Working Group (GCP IWG)
Date for coming into effect 01 August 2010

Reflection paper on expectations for electronic source data and
data transcribed to electronic data collection tools in clinical trials

References
2. CDISC (Clinical Data Interchange Standards Consortium) Clinical Research Glossary Version 8.0,
DECEMBER 2009
http://www.cdisc.org/stuff/contentmgr/files/0/be650811feb46f381fdaaf41ca40ade2e/misc/cdis 2009_glossary.pdf.
3. CDISC e-source standard requirements-CDISC (Clinical Data Interchange Standards Consortium)
Version 1.0 20 November 2006.

eSource = data entered electronically first, i.e. EHRs, eDiaries....
EHR Pilot: Prospective Clinical Research Study

August 2015: UCB, Medidata, and CDISC agreed to pilot the use of EHR data exchange in a study as part of their response to the FDA eSource FR notice.

November 2015: F2F meeting with the study team, Medidata, and CDISC. Discussed various issues, including privacy concerns.

Developed a 3-tier questionnaire for site selection (the questions gradually get more technical with each tier).

March 2016: Site selection continues for the initially targeted study. Most sites still use paper source for their clinical trial data (!!) even though they use EHR for their patients.

Two additional studies have been targeted for the pilot.

Medidata is putting the finishing touches on their EHR data integration solution.

Source: Trisha Simpson, UCB Biosciences

Initiated team to map CCDA to CDASH (called E2C Team for EHR to CDASH); PMDA funding similar mapping in Japan to SSMIX.
Actions: Auto-populate data transmission; surface forms within EHR; redact the CCD; ensure audit trail (provenance) and security

Time, Data Provenance, Quality and Security

Source: Amy Nordo, Duke

NOTE: REDCaP now adding CDASH/ODM forms to Library
HHS/ONC Interoperability Roadmap

Connecting Health and Care
for the Nation
A Shared Nationwide
Interoperability Roadmap
DRAFT Version 1.0

Research Standards
now Listed in the
HHS/ONC
Interoperability
Standards Advisory
The European Institute For Innovation Through Health Data

Enriching knowledge and enhancing care through health data

Source: Dr. Dipak Kalra, i~HD and EuroRec, February 2016
There is a need to combine and sustain the results of European projects and to form partnerships.
i~HD has been formed because a complementary, neutral and not-for-profit organisation is needed

- to play a central role in governing and expanding a trustworthy health data driven ecosystem including EHRs and clinical research platforms
- to promote the adoption of healthcare standards and of data quality, to enable more effective, safer and better integrated healthcare
- to act as a connector between health care and clinical research standards, that are presently developed in silos and impair the interoperability and pooling of health data for research
- to promote to society the importance of using health data for research, to improve efficiency through reduced duplications, delays, costs enhance speed and efficiency in clinical studies
User Interface Extension to ODM

- CDISC ODM extended with GUI elements
- When an ODM is created, the QuestionType attribute is added to every ItemDef object in ODM
- Platform-agnostic, rendered appropriately for each device

Source: Brendan Delaney, TRANSFoRm
Quantifying the Value of Standards

- Cycle Time (and Cost) Savings -

Note: Figures are benchmarks based on aggregate data; study-specific cycle times and cost metrics will vary.

Study Conduct does not include subject participation time.
When we don’t share findings in clinical research, it’s as if billions of dollars get buried. When that happens, we all lose out on finding cures for diseases that affect the people we love.
Strength through collaboration.
CDISC Interchanges in 2016

Europe Interchange
Vienna, Austria
April 2016

Japan Interchange
University of Tokyo
2-3 June 2016

www.cdisc.org/Events

25-29 September in Bethesda, MD
LHC Initiative: Essential Standards to Enable Learning (ESTEL) Charter

Purpose and Scope:

To define a parsimonious/essential/minimum core set of standards that could enable a standards-based yet flexible and scalable LHS in accordance with the following goals:

• a) Ease the burden for any clinician to participate in a research study or other learning activity;
• b) Increase the capacity for learning from data;
• c) Obtain knowledge and results in an actionable form to contribute to building the LHS;
• d) Ensure that the data obtained can be readily aggregated and/or compared; and
• e) Ensure that the data uphold scientific integrity.

~ December 2012