T.W.I.S.T.

Obtaining Electronic Data for Research

Presented by Thomas Campion, PhD
Obtaining Electronic Data for Research: ARCH, TRAC, and You!

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Director, Research Informatics

8.17.16
Overview

Problem

Approach

Research Computing at Weill Cornell Medicine
Architecture for Research Computing in Health (ARCH)

Example

Discussion
Problem

Obtaining electronic health record (EHR) data for clinical and translational research is difficult

Repurpose transactions for research
Use one or more tools
Understand strengths and limitations
Obtain approval

Optimal approaches are unknown

Research Informatics can help investigators

Obtain EHR data
Collect novel measures
Integrate data
Approach: Research Computing at Weill Cornell Medicine

- Scientific Computing
- Research Informatics
- Research Administrative Computing

Information Technology Infrastructure
Obtaining Electronic Data for Research

Approach: Architecture for Research Computing in Health (ARCH)

- Multi-institutional Data Sharing
- College-wide Cohort Discovery
- EHR Reporting
- Research Data Repositories
- Electronic Data Capture (EDC) integrated with EHR
- EHR Interventions

Retrospective

Prospective

- Consent
- WCM-NYP-CUMC Data Sharing
- Biobank and Ancillary Omics
- Data Core

Data Integration

Clinical Translation

Compliance & Planning

Scientific Computing
Approach: Architecture for Research Computing in Health (ARCH)

Retrospective

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Prospective

Data Integration
Approach: Architecture for Research Computing in Health (ARCH)

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- EDC integrated with EHR

Data Integration
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Model

Data Integration

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Prospective

Technology Provider

POIS or NYP
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Tripartite Request Assessment Committee (TRAC)

Technology Provider

POIS or NYP
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- Technology Provider
  - i2b2
  - Epic
  - Allscripts
  - ITS
  - POIS or NYP

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Technology Provider
- NYGC, HPR, and ITS
- ITS
- POIS or NYP

NYC-CDRN
New York City Clinical Data Research Network

Epic

Allscripts

i2b2
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- EDC integrated with EHR
- NYC-CDRN
- Epic
- Allscripts
- i2b2
- pcornet

Institutional Logos:
- WCM
- NYP
- Montefiore
- CDN

College-wide Cohort Discovery
Approach: Architecture for Research Computing in Health (ARCH)

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Technologies:
- i2b2
- Epic
- Allscripts
- REDCap

Providers:
- NYC-CDRN
- NYGC, HPR, and ITS
- ITS
- POIS or NYP
- CTSC

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NYC-CDRN
Epic
Allscripts
i2b2
REDCap
SUPER
REDCap

Technology Provider
NYGC, HPR, and ITS
ITS
POIS or NYP
CTSC
CTSC and ITS

Weill Cornell Medicine
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EDC

Weill Cornell Medicine

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Retrospective

Prospective

Epic

Allscripts™

REDCap
### Approach: Architecture for Research Computing in Health (ARCH)

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**Tools:**
- Epic
- REDCap
- Allscripts
- CompuRecord
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Software Tools:
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- Allscripts
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- Biobank
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Approach: ARCH Research Data Repository

Disparate Sources

- Epic
- Allscripts
- CompuRecord
- REDCap
- iProfiler
- Other

Centralized Integration

- Aggregate
- Transform

Research Data Repositories (RDRs)
Approach: ARCH Research Data Repository

Disparate Sources

Research Data Repositories (RDRs)

Centralized Integration

Aggregate

Transform

Anesthesiology
Approach: ARCH Research Data Repository

Disparate Sources

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- iProfiler

Centralized Integration

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Research Data Repositories (RDRs)

Center for Advanced Digestive Care
Approach: ARCH Research Data Repository

Disparate Sources

Epic
Allscripts
REDCap
FreezerPRO
GENOPTIX
Excel
Weill Cornell Medicine

Research Data Repositories (RDRs)

Centralized Integration

Aggregate
Transform

Leukemia Program

Obtaining Electronic Data for Research
Approach: RDR Functions

Discovery
- Hypothesis generation
- Patient counts

Collection
- Capture of novel measures
- Annotation of existing data

Analysis
- Hypothesis testing
- Data sharing
Example: ARCH for Cystic Fibrosis (CF)

How many patients have CF?

College-wide Cohort Discovery

i2b2
Example: ARCH for Cystic Fibrosis (CF)

College-wide Cohort Discovery

1,200 patient MRNs with CF

EHR Reporting

Epic

i2b2

How many patients have CF?
Example: ARCH for Cystic Fibrosis (CF)

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EHR Reporting

Detailed visits & lab results

Data Analysis

How many patients have CF?

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Example: ARCH for Cystic Fibrosis (CF)

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EHR Reporting

Detailed visits & lab results

Data Analysis

Refined question research requiring statistical power
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Detailed visits & lab results

Refined question research requiring statistical power

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Multi-institutional Data Sharing

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New York City Clinical Data Research Network

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- How many patients have CF?
- College-wide Cohort Discovery
- EHR Reporting
- Data Analysis
- Multi-institutional Data Sharing

1,200 patient MRNs with CF
Detailed visits & lab results
10,000 patient data set

Refined question research requiring statistical power

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Detailed visits & lab results
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Epic
Sas
NYC-CDRN

Weill Cornell Medicine
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Data Analysis

10,000 patient data set

Multi-institutional Data Sharing

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Data Analysis

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Multi-institutional Data Sharing

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Discussion

Research Informatics can help investigators

Obtain EHR data
Collect novel research data
Integrate data

ARCH matches investigators with right tools and services with respect to

Study design
Data sources
Cost
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Questions

Access and inquiries

i2b2 access: i2b2-support@med.cornell.edu
ARCH inquiries: arch-support@med.cornell.edu

Web resources

ARCH: http://arch.weill.cornell.edu
NYC-CDRN: http://www.nyccdrn.org
TRAC inpatient data: https://webapps.nyp.org/trac
Epic outpatient data: https://sharepoint.weill.cornell.edu/sites/pois/POISRequests/

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