Obtaining Electronic Patient Data for Research

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Overview

Problem

Approach

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

Examples

Discussion
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
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)
- EHR integrated with EHR
- EHR Interventions
- 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)

- Multi-institutional Data Sharing
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- EDC integrated with EHR

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

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Data Integration
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Data Integration

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Data Integration
Clinical Translation

Approach: Architecture for Research Computing in Health (ARCH)

Retrospective

- Multi-institutional Data Sharing
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Prospective

- EHR Interventions

Model

Data Integration

Clinical Translation

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Retrospective

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Prospective

Technology Provider

POIS or NYP
Approach: Architecture for Research Computing in Health (ARCH)

- Retrospective:
  - Multi-institutional Data Sharing
  - College-wide Cohort Discovery
  - EHR Reporting
  - Research Data Repositories

- Prospective:
  - Electronic Data Capture (EDC)
  - EDC integrated with EHR

Tripartite Request Assessment Committee (TRAC)

Technology Provider

POIS or NYP

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

Retrospective

Multi-institutional Data Sharing
College-wide Cohort Discovery
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EDC integrated with EHR

Prospective

Technology Provider

NYGC, HPR, and ITS
ITS
POIS or NYP

NYC-CDRN
New York City Clinical Data Research Network
Epic
Allscripts
i2b2

Weill Cornell Medicine

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

Multi-institutional Data Sharing
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Retrospective
Prospective

NYC-CDRN
pcornet
Epic
Allscripts
i2b2

WCM
NYP
Mount Sinai
NYU Langone Medical Center
Montefiore
CDN
CLINICAL-DIRECTORS-NETWORK
Approach: Architecture for Research Computing in Health (ARCH)

- Multi-institutional Data Sharing
- College-wide Cohort Discovery
- EHR Reporting
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- EDC integrated with EHR

Technology Providers:
- NYC-CDRN
- Epic
- Allscripts
- REDCap
- i2b2

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

Technology Provider:
- NYC-CDRN
- Epic
- i2b2
- Allscripts
- REDCap
- NYGC, HPR, ITS
- POIS or NYP
- CTSC
- CTSC and ITS
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)
- EDC integrated with EHR

**Retrospective**

**Prospective**
Approach: Architecture for Research Computing in Health (ARCH)

Retrospective

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

Prospective

Epic

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

- Multi-institutional Data Sharing
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Retrospective

Prospective
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)
- EDC integrated with EHR

- Epic
- REDCap
- Allscripts
- CompuRecord

Weill Cornell Medicine

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

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

Prospective: EHR Reporting, Research Data Repositories, Electronic Data Capture (EDC) integrated with EHR, Biobank
Obtaining Electronic Data for Research

Approach: Architecture for Research Computing in Health (ARCH)

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

Retrospective

Prospective

Biobank
REDCap
CompuRecord
Allscripts
Approach: ARCH Research Data Repository

Disparate Sources

- Epic
- Allscripts
- CompuRecord
- REDCap
- Profiler
- Other

Research Data Repositories (RDRs)

Centralized Integration

- Aggregate
- Transform

Obtaining Electronic Data for Research
Approach: ARCH Research Data Repository

Disparate Sources

Epic
Allscripts
CompuRecord

Centralized Integration

Aggregate

Transform

Research Data Repositories (RDRs)

Anesthesiology
Approach: ARCH Research Data Repository

Disparate Sources

Research Data Repositories (RDRs)

Centralized Integration

Aggregate → Transform

Center for Advanced Digestive Care

Epic
Allscripts
CompuRecord
REDCap
iProfiler
Approach: ARCH Research Data Repository

Disparate Sources

- Epic
- Allscripts™
- REDCap
- FreezerPRO
- GENOPTIX
- Excel

Research Data Repositories (RDRs)

Centralized Integration

- Aggregate
- Transform

Leukemia Program
Approach: ARCH Research Data Repository
Approach: ARCH Research Data Repository

Data

Tools

i2b2

SUPER

REDCap

SQL Server

Other

Epic

Allscripts

Weill Cornell Medicine

Obtaining Electronic Data for Research

28
Approach: ARCH Research Data Repository

**Discovery**
- Hypothesis generation
- Patient counts

**Collection**
- Capture of novel measures
- Annotation of existing data

**Analysis**
- Scientific variable definition
- Hypothesis testing

**Tools**
- i2b2
- SUPER
- REDCap
- Epic
- Allscripts

**Data**

**Workflows**

**Other**

- Microsoft SQL Server
Obtaining Electronic Data for Research

Approach: ARCH Research Data Repository

**Data**
- Epic
- Allscripts
- REDCap
- Other

**Tools**
- i2b2
- SUPER
- REDCap
- SQL Server

**Workflows**

**Discovery**
- Hypothesis generation
- Patient counts

**Collection**
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**Analysis**
- Scientific variable definition
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**Examples**
- Identify patients of interest
- Record rare findings from experts
- Define rows-and-columns of data set
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

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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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