The NIH Biomedical Translational Research Information System (BTRIS)

Town Hall Meeting - Information Session
February 26, 2008
Lipsett Auditorium
The Reuse of Biomedical Data

- Secondary uses of clinical data for:
  - Patient care
  - Research
  - Administrative processes

- Use of patient data for research

- Use of research data for patient care ("translational research")

- Data may require transformation:
  - De-identification and Re-identification
  - Indexing
  - Aggregation by time
  - Abstraction by classification
  - Conversion to relevant concepts
Brief Bio

• Internal medicine residency (St. Vincent’s, NY)
• Medical informatics fellowship (Harvard/MGH)
• 20 years at Columbia
  – Informatics research
  – Building clinical systems
  – Teaching informatics and medicine
  – Clinical practice
• Clinical data repository and warehouse
  – 25+ data sources
  – 2,000,000 patients
  – 20 years of data
  – Innovations in coding and organization
  – Concept-based queries
  – Natural language processing (NLP)
How often are patients with the diagnosis of myocardial infarction started on beta blockers?

<table>
<thead>
<tr>
<th>NAME</th>
<th>James J. Cirino</th>
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<tbody>
<tr>
<td>DEPARTMENT</td>
<td>Biomedical Informatics</td>
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<tr>
<td>TITLE &amp; RANK</td>
<td>Professor</td>
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<td>Principal Investigator</td>
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**Protocol/Project Name and a Brief Description**
- Testing the use of MED Codes in the Warehouse

**Project Sponsorship/Reason**
- Investigator Initiate

**Principal Investigator**
- James J. Cirino

**Date of Request**
- 3/31/2005

**Date Report Is Required**
- 04/05/2005, e.g. 12/31/2005

**Data Requested**
- 1) Number of patients with discharge diagnosis of Myocardial Infarction (MED Code 2618 or descendants, ICD-9-CM Code 410.00 to 410.99), by year from 2000-2004.

**Approval Level**
- Summary/Non-identify info only (No restriction)

**Human Subject Involved?**
- ☑ YES   ☐ NO

**If Yes, IRB #**
How often are patient with the diagnosis of myocardial infarction started on beta blockers?

Find all patients with
Diagnosis in class **MYOCARDIAL INFARCTION**

Find all patients with
Diagnosis in class **MYOCARDIAL INFARCTION** AND with
Medication in class **BETA BLOCKER**
What is BTRIS?

- Formerly “CRIS-II”
- Not “Son of CRIS”
- Not just clinical
- Includes focus on translational research
- Hence: *Biomedical Translational Research Information System*
What is BTRIS?
What is BTRIS?
What is BTRIS?

Data Repository

Data Acquisition Processes:
- Coding
- Indexing
- De-Identifying
- Permission Setting

Data Retrieval Functions:
- Authorization
- Subject-Oriented
- Cross-Subject
- Re-Identification
- NLP

Data Analysis Tools:
- Hypothesis Generation
- Hypothesis Testing

Subject Recruitment

Ontology
<table>
<thead>
<tr>
<th>Queries from Requirements-Gathering</th>
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<tr>
<td><strong>• Provide Medication lists at time of patient encounters. Include drug diaries for inpatient, outpatient and in-between encounters in the patient medical record. Include all chemo and non-chemo drugs from CRIS and IC systems</strong></td>
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<td><strong>• Provide Medication administration documentation (drug diaries) with times as part of patient record</strong></td>
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<td><strong>• Provide ability to compare patient results, Medication Administration Records between dates and/or encounters</strong></td>
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<td><strong>• Provide drug randomization info, compliance records and drug accountability info for all investigational, study and prescription drugs</strong></td>
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<tr>
<td><strong>• Provide all Clinical Center lab results with times of specimen draws</strong></td>
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<td><strong>• Provide external lab results</strong></td>
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<td><strong>• Provide archival images</strong></td>
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<td><strong>• Provide demographics data including age, BMI, race, gender, contact info, etc</strong></td>
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<td><strong>• Provide access to genomics and bio-markers data</strong></td>
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<td><strong>• Provide cumulative blood volumes, research drugs and radiation for subject over a given period</strong></td>
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<td><strong>• Provide ability for ICs to feed expanded diagnosis/problem lists</strong></td>
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<td><strong>• Provide searching and filtering patients' data by all diagnosis, tests, procedures, protocol &amp; protocol classifications</strong></td>
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<td><strong>• Standardize medication and lab test codes.</strong></td>
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<td><strong>• Provide integration of adverse events data in the data warehouse,</strong></td>
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<td><strong>• Provide integration of protocol census, status and subject accrual tracking data from Protrak in the data warehouse.</strong></td>
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<td><strong>• Provide ability to attribute different events to protocols, viz., consent signed, protocol activated, orders, observations, adverse events, etc</strong></td>
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<td><strong>• Provide integration of staff, patient and user index data across source systems in data warehouse.</strong></td>
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<td><strong>• Provide original informed consent, and updated consents for re-contact of patients for research for all protocols. Provide searchable consents and image of consents in database. Provide answers to:</strong></td>
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<tr>
<td><strong>– Can tissues be used for cancer/genetic research, other research, germ line testing</strong></td>
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<td><strong>– Can patient be re-contacted for questions?</strong></td>
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<td><strong>• Provide single patient amendments</strong></td>
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<td><strong>• Provide access and track biological specimen data</strong></td>
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<td><strong>• Provide access to Appointment Data</strong></td>
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<td><strong>• Provide “Review of Systems” info for each patient visit.</strong></td>
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<td><strong>• Provide patient de-identification services</strong></td>
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<td><strong>• Standardize Units Of Measure</strong></td>
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Access Control Issues

- Ownership of data
- Authorization for re-use
- Confidentiality and re-Identification of data
The PI User Group

- Volunteers from NIH community
- Most likely to benefit from BTRIS
- Help set requirements and priorities
- Commitment to participate
  - Weekly meetings
  - Review materials, screen shots, demos
- Beta testers – first access to demonstration
BTRIS Demonstration Environment
BTRIS Demonstration Environment
BTRIS Demonstration Environment

PI User Group

Biomedical Ontology
And Dictionary
Demonstration Project

• **Sources:**
  – Current laboratory data
  – Old laboratory data (CDW/CDR or MIS)
  – Pharmacy orders (CRIS-I or MIS)

• **Terminology Services**
  – Code look-up
  – Simple class-based queries

• **Data services**
  – Data aggregation across sources
  – Data summarization by concept class
  – Patient identification for possible recruitment
  – …as per PI User Group
Timeline for Initial Rollouts

- Demonstration Project: July 2008
- BTRIS: July 2009
BTRIS Will:

• Be the preferred system to analyze NIH clinical and non-clinical data

• Aggregate and standardize disparate and isolated data sets

• Automate and streamline processes that are traditionally manual and cumbersome

• Prioritize data sources and functionality based on needs of user community
Additional Information

www.btris.nih.gov

Questions about BTRIS
or to join the PI User Group:

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