REDCap Data Transfer Services (REDCap DTS)

Robert Schuff, M.S.
Director, Clinical Research Informatics
Oregon Clinical and Translational Research Institute

OCTRI OREGON CLINICAL + TRANSLATIONAL RESEARCH INSTITUTE Biomedical Informatics Program

Today's Talk

- DTS goals and design
- Data acquisition process
- Early results
- Forthcoming release and webinars

REDCap Data Transfer Services (DTS)

Data Management Problem

Researchers are manually entering data from external systems such as EMRs, lab systems, etc into REDCap

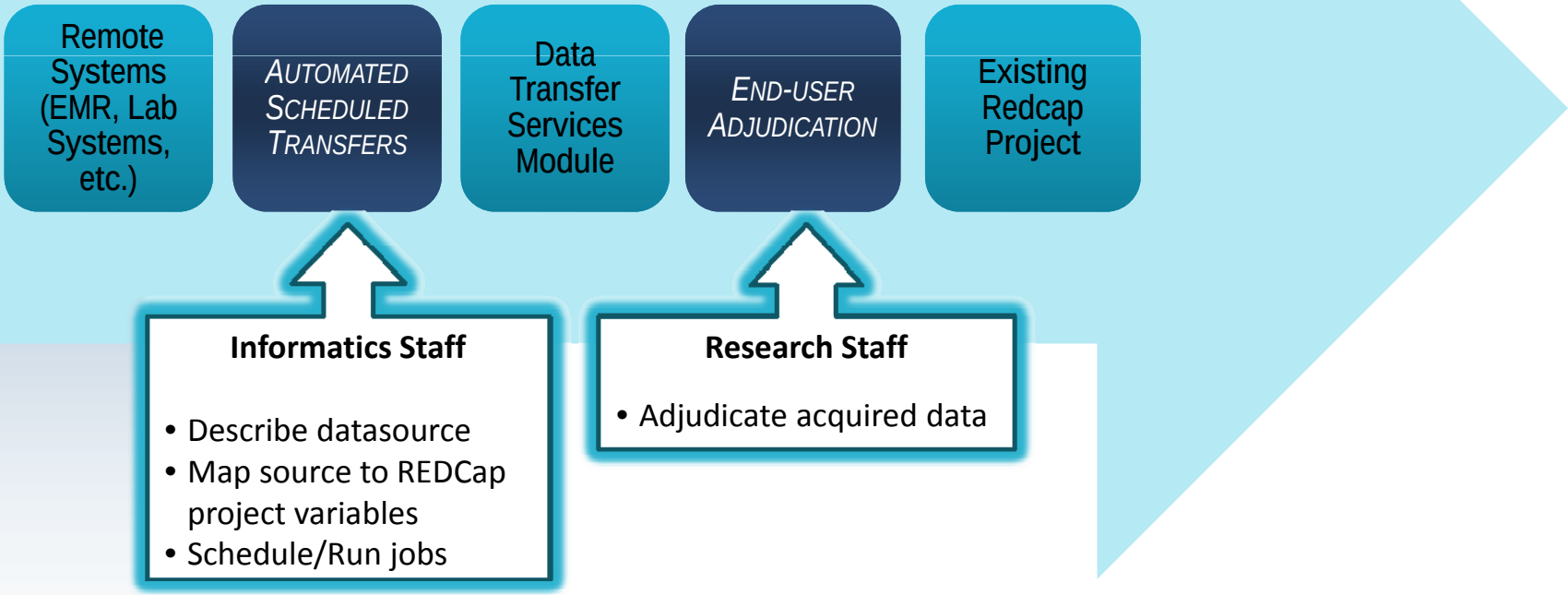
Solution

Create a secure and flexible methodology to enable interoperability between REDCap data collection system and external data systems.

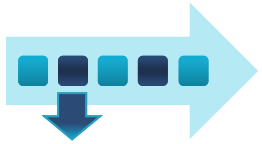
DTS Design Considerations

- Diversity of computing environments requires minimizing assumptions about and requirements of data sources
  - Plug-in architecture to support multiple source dataset formats
  - CSV and SQL-based datasets supported
  - Standard and entity attribute value (EAV) data structures supported
- Must automatically interact with external systems in a minimally intrusive and secure fashion
- Must integrate seamlessly with REDCap
  - Workflow, security, logging functions

DTS Two-stage Overall Workflow



Describe Datasource Workflow



Transfer

Name: RDW_OCTRI944_RCDTS_V

Connector: RDW - Prod

Fetch Command: select MRN_CD ,TO_CHAR(ENC_DT, 'YYYY-MM-DD HH24:MI:SS') as "ENC_DT" ,TSH_VAL ,HEMOGLBN_VAL ,PLASM_GLUCOS_VAL ,LDL_VAL ,TRIGLYCRD_VAL ,FREE_T4_VAL from OCTRIRDW.RDW_OCTRI944_RCDTS_V where MRN_CD = :pat_id and ENC_DT between TO_DATE(:start_date,'YYYY-MM-DD HH24:MI:SS') and TO_DATE(:end_date,'YYYY-MM-DD HH24:MI:SS')

Status: Active

Transfer Variables

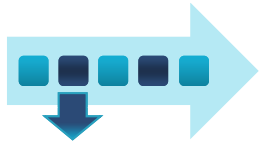
Alias	Source Variable Name	Field Type	EAV?	Attribute Column	Value Column
Medical Record	MRN_CD	Identifier	No	MRN_CD	MRN_CD
Encounter Date	ENC_DT	Temporal	No	ENC_DT	ENC_DT
TSH_VAL	TSH_VAL	Transfer	No	TSH_VAL	TSH_VAL
HEMOGLBN_VAL	HEMOGLBN_VAL	Transfer	No	HEMOGLBN_VAL	HEMOGLBN_VAL
PLASM_GLUCOS_VAL	PLASM_GLUCOS_VAL	Transfer	No	PLASM_GLUCOS_VAL	PLASM_GLUCOS_VAL
LDL_VAL	LDL_VAL	Transfer	No	LDL_VAL	LDL_VAL
TRIGLYCRD_VAL	TRIGLYCRD_VAL	Transfer	No	TRIGLYCRD_VAL	TRIGLYCRD_VAL
FREE_T4_VAL	FREE_T4_VAL	Transfer	No	FREE_T4_VAL	FREE_T4_VAL

list edit delete

"Connector" is defined similarly to ODBC/JDBC datasource.
"Fetch Command" is either a valid parameterized SQL statement or for CSV files, a valid filename.

Each source dataset must define fields that identify the participant and, if multiple observations are possible, the date/time of the observation

Map REDCap Variables Workflow



Project Transfer

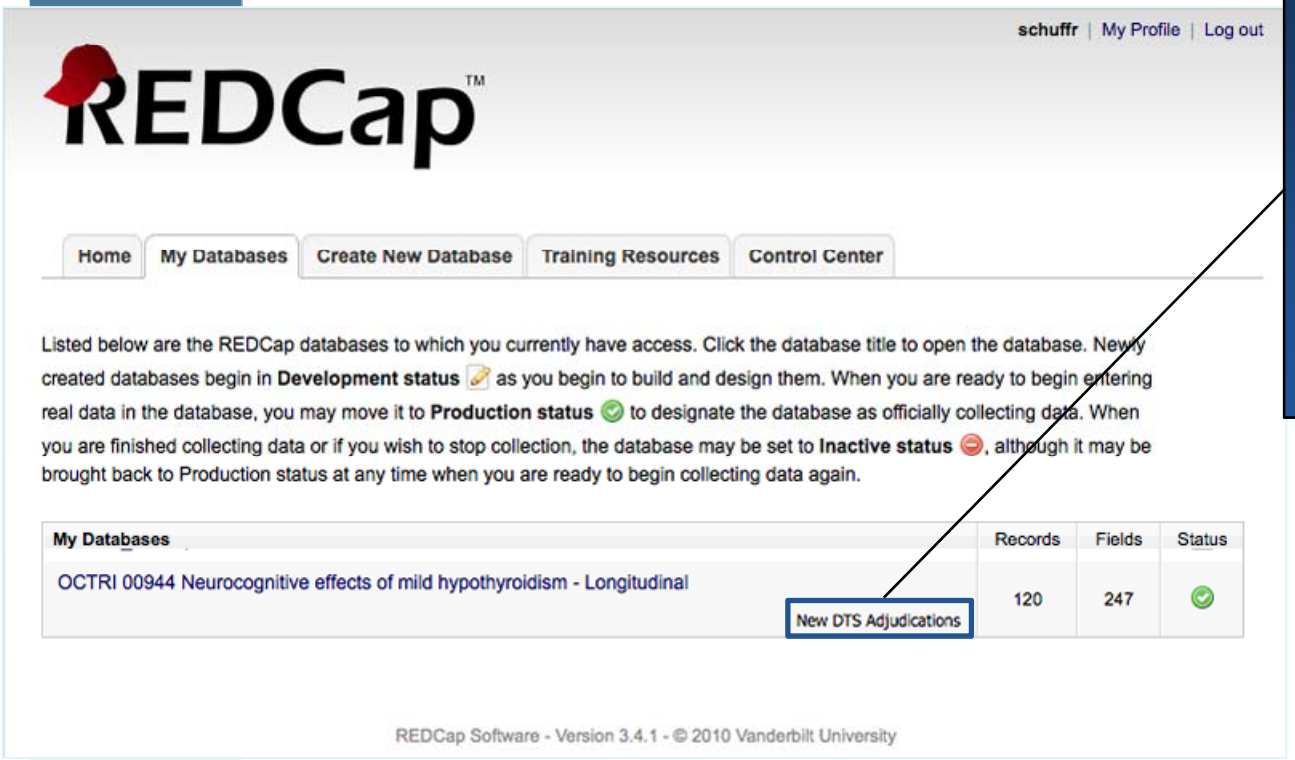
REDCap Project Name:	octri_00944_neurocognitive_effects_of_mild_hypothy
REDCap Identifier:	mrn
Transfer:	RDW_OCTRI944_RCDTS_V
Status:	Active

Project Transfer Variables

Event/Form Name	Transfer Variable	Informational Variable	Target Field	Temporal Field
Prescreen	PLASM_GLUCOS_VAL		glucose	visit_date
Prescreen	HEMOGLBN_VAL		hbg	visit_date
Prescreen	LDL_VAL		ldl	visit_date
Prescreen	TRIGLYCRD_VAL		tgl	visit_date
Prescreen	TSH_VAL		tsh	visit_date
TSH Check 1	TSH_VAL		tsh	visit_date
TSH Check 2	TSH_VAL		tsh	visit_date
Screen	PLASM_GLUCOS_VAL		glucose	visit_date
Screen	HEMOGLBN_VAL		hbg	visit_date
Screen	LDL_VAL		ldl	visit_date
Screen	TRIGLYCRD_VAL		tgl	visit_date
Screen	TSH_VAL		tsh	visit_date
Baseline Cog Visit (V1	TSH_VAL		tsh	visit_date

Optionally, any one of the "informational fields" (defined in the fetch command) may be associated with REDCap variables to assist the researcher in selecting the proper instance of a variable to be saved to their REDCap database.

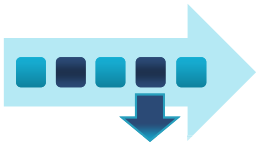
Adjudicate Data Workflow



You've got data!

Projects that have acquired data waiting for adjudication are indicated on the "My Databases" page

Adjudicate Data Workflow



Incoming data for a participant in a REDCap project are grouped by event, date, and variable. Only one mouse click is required for each decision.

"Best guess" instances of each variable are color-coded to indicate a match by date or a mismatch with existing REDCap data.

Once accepted, data are written to the REDCap database

Adjudication for REDCap Study ID: 1

Data Adjudication Table

Form	Event	REDCap Variable	REDCap Date	Source Date	REDCap Value	Source Value	Info	Status
timepoints	T0 enrollment	glucose	2009-09-27	2009-09-26	157	137		
				2009-09-27	157	157		reset
				2009-09-27	157	142		
				2009-09-27	157	165		
				2009-09-27	157	180		
				2009-09-27	157	146		
				2009-09-28	157	123		
							Reject All	
timepoints	T0 enrollment	hct	2009-09-27	2009-09-26	46	46		reset
				2009-09-27	46	41		
				2009-09-27	46	44		
				2009-09-27	46	34		
				2009-09-28	46	41		
timepoints	T0 enrollment	hdl	2009-09-27	2009-09-27	32	32		
				2009-09-28	32	27		
timepoints	T0 enrollment	i_calcium	2009-09-27	2009-09-27		4.2		
				2009-09-27		4.2		
				2009-09-27		4.1		
				2009-09-27		4.0		
timepoints	T0 enrollment	lactate	2009-09-27	2009-09-27		1.4		
				2009-09-27		1.8		
				2009-09-27		1.3		

REDCap Date	Source Date	REDCap Value	Source Value	Info	Status
2009-09-27	2009-09-26	157	137		
	2009-09-27	157	157		reset
	2009-09-27	157	142		
	2009-09-27	157	165		
	2009-09-27	157	180		
	2009-09-27	157	146		
	2009-09-28	157	123		
					Reject All
	2009-09-26				

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Early results from the field

- Live at Oregon and Vanderbilt as of late September
  - Oregon's first project
    - Study has: 224 variables, 2 arms, 16/4 events in each arm respectively
    - 120 participants currently in database
    - Data acquired through DTS: Plasma glucose, hemoglobin, LDL, triglycerides, TSH
    - 216 queries (once per event per subject) 490 recommendations
  - Vanderbilt's first project
    - Study has: 413 variables, single arm, 17 events
    - 130 participants currently in database
    - Data acquired through DTS: Laboratory Tests (29 assays)
    - 899 queries (once per event per subject), 73,350 recommendations

What's next

- Finalizing integration into REDCap
- Release early December
- Webinar immediately post-release walking through installation and configuration
- Interoperability monthly calls (next is Tuesday December 21)

Acknowledgements

- OHSU
  - Rob Schuff, Liz Moyer, Erik Benton, Jeffrey Horn
- Vanderbilt
  - Paul Harris, Rob Taylor, Jon Scherdin
- Mayo
  - Michael Lin, Rob Pawluk

Supported in part by CTSA grants at Oregon Health and Science University (UL1 RR024140) & Vanderbilt University (UL1 RR024975)

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