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Introduction

In SGH, there is a wide usage of electronic medical records such as Electrical Medical Record (EMR) and Electronic Health Intelligence System (eHintS) to access patients' information. All laboratory, radiology, operating theatre, pharmacy and discharge information are already electronic. However, these medical records are not structured for research usage and data cannot be easily obtained. In order to extract research-friendly clinical data, Health Services Research Unit (HSR) has implemented a centralized research database infrastructure for staff to collect data without needing to understand structured query language or the underlying database model.

Objectives

To build up research data management capability and ease the burden of research staff.

To ensure good practice of data collection and management.

To improve research service quality.



Method



Research Electronic Data Capture (REDCap)

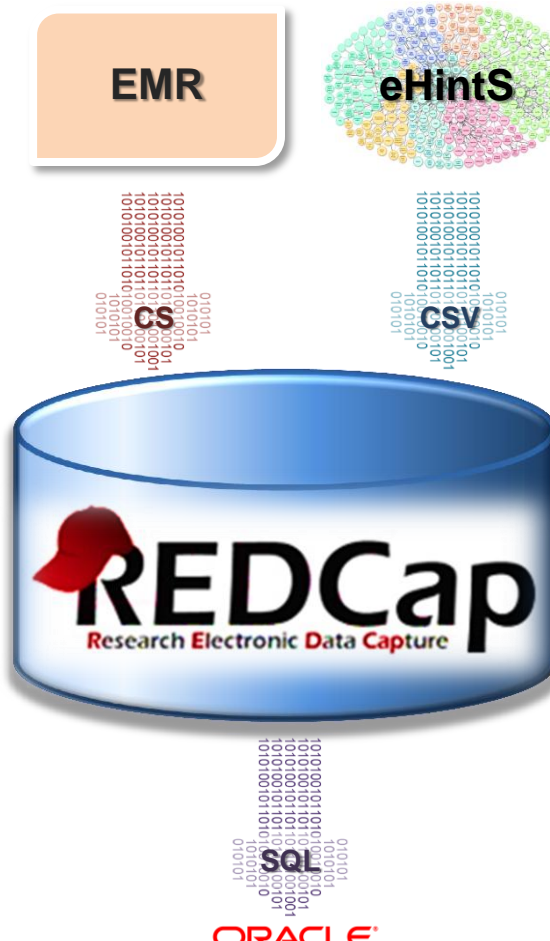
- Web-based software developed by Vanderbilt University for data collection, management and analysis
- Uses Hypertext Pre-processor (PHP) + JavaScript programming languages and MySQL database engine for data storage and manipulation
- User interface provides an intuitive method to securely and accurately input data for research studies
- Pulls data from EMR and imports Comma-Separated Values (CSV) files from eHintS

Context Switch (CS)

- Allows REDCap to communicate with EMR
- Developed using .NET framework to link certain variables from EMR with REDCap
- Data captured under those variables could be pulled seamlessly from EMR to REDCap

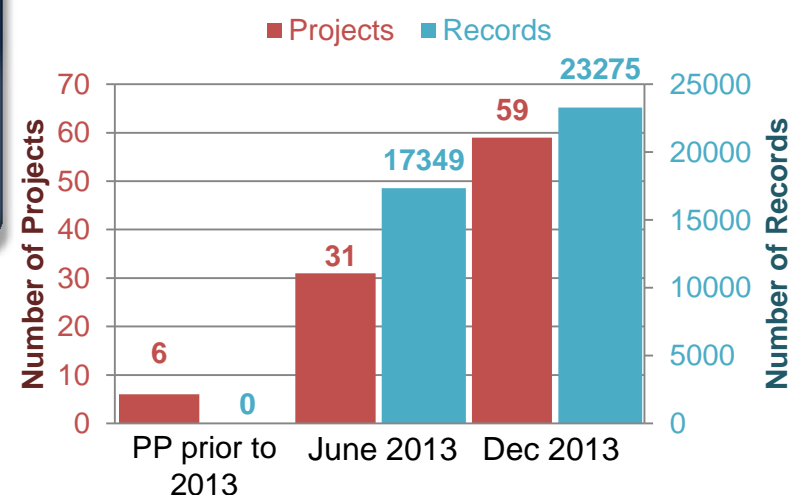
Oracle Business Intelligence Enterprise Edition (OBIEE)

- Interacts with REDCap via Structured Query Language (SQL)
- Presents a framework which allows users to query research data kept in REDCap and design interactive reports
- Appears as highly interactive web pages accessible anywhere within SGH
- Presents data visually in charts, pivot tables and dashboards
- Users are able to customize reports and download all data shown into Excel or CSV files



Results

| | Depts. | Projects | Records |
|--|--------|----------|---------|
| Pilot Projects (PP) prior to 2013 | 5 | 6 | 0 |
| Jun-13 | 13 | 31 | 17349 |
| Dec-13 | 15 | 59 | 23275 |



Conclusion

1. Generally meets the needs of researchers
2. Easily scalable hospital-wide
3. Rapid deployment capabilities
4. Cost-effective and reduce "reinventing wheels" situations
5. Regular system maintenance and upgrades
6. Efficient and sustainable solution that improves overall research service quality

Acknowledgement

Study data were collected and managed using REDCap electronic data capture tools hosted at SGH.¹
¹Paul A. Harris, Robert Taylor, Robert Thielke, Jonathon Payne, Nathaniel Gonzalez, Jose G. Conde, Research electronic data capture (REDCap) - A metadata-driven methodology and workflow process for providing translational research informatics support, J Biomed Inform. 2009 Apr;42(2):377-81.

