



2020 LEAD Capstone Poster Session

Streamlining the Data Pipeline

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Abstract

- Robust disease registries have been vital during recent outbreaks and pandemics but require extraction of large-volume, high-fidelity clinical data.
- Errors in electronic medical records (EMRs) are common^{1,2} and usually only detectable by manual chart review.
- Manual chart review is time- and labor-intensive.^{3,4}
- Tools allowing for direct interface between EMRs and research data capture platforms should be leveraged to streamline data acquisition and improve data validation.⁵



Objectives

- Develop tools and systems to rapidly and automatically populate existing research and registry data capture platforms with high-fidelity clinical data.
- Directly integrate research and registry data capturing into the EMR for seamless data entry into the patient record and research registry simultaneously.
- Empower clinical staff and trainees to participate in research by posing questions, acquiring data, and performing data cleaning and validation.



Background Information

- The importance of clinical registries has been highlighted by COVID.
- Robust disease registries require large volumes of highly accurate clinical data, much of which is manually curated.
- Manual data acquisition and entry is laborious and time-consuming, impeding the ability to quickly analyze data and pivot.
- Systems that securely and directly import data into research and registry platforms already exist and have been successfully used at other academic institutes.
- Data that is automatically extracted can then be cleaned and validated more efficiently by research and registry personnel.



Specific Aims

- Test, validate, and deploy an application platform interface (API) that directly imports data from the EMR to REDCap, a widely-adopted, intuitive, locally hosted research data capture platform.
- Collaborate with a team of EMR analysts, REDCap administrators, and data scientists to integrate REDCap into the EMR natively.



Project Plan



Enable API for direct data exportation between EMR and REDCap



Validate data exportation to refine queries and evaluate data quality



Embed REDCap in Epic for seamless data acquisition in research endeavors

Stakeholders: Hospital Chief Information Officer, Clinical Informatics Center, Clinical and Translational Research Administration



Application of what you learned at LEAD

- Understanding and leveraging DISC profiles to effectively communicate with diverse stakeholders
- Developing an effective situational leadership style
- Identifying concrete, discrete aspects of a complex problem
- Strategic planning to accomplish a high-value project



Proposed Budget

- Enabling API between EMR and REDCap: No additional cost
- Validating and improving data quality and refining automated data extraction: 0.1 FTE
- Embedding REDCap into the EMR natively: \$25,000 per year of salary support for dedicated time from an EMR analyst for deployment and maintenance



Innovation and Significance

- Maximizing automated clinical data importation decreases transcription errors and increases efficiency of research personnel.
- Direct data importation improves security of patient information.
- Native embedment of REDCap into the EMR allows for “one-click” data entry.
- Seamless integration of REDCap and the EMR strengthens disease registries and clinical research.



References

1. Bell, S. K., Delbanco, T., Elmore, J. G., Fitzgerald, P. S., Fossa, A., Harcourt, K., Leveille, S. G., Payne, T. H., Stametz, R. A., Walker, J., & DesRoches, C. M. (2020). Frequency and Types of Patient-Reported Errors in Electronic Health Record Ambulatory Care Notes. *JAMA Network Open*, 3(6), e205867. <https://doi.org/10.1001/jamanetworkopen.2020.5867>
2. Bell, S. K., Mejilla, R., Anselmo, M., Darer, J. D., Elmore, J. G., Leveille, S., Ngo, L., Ralston, J. D., Delbanco, T., & Walker, J. (n.d.). When doctors share visit notes with patients: a study of patient and doctor perceptions of documentation errors, safety opportunities and the patient-doctor relationship. <https://doi.org/10.1136/bmjqs-2015-004697>
3. Karanevich, A. G., Weisbrod, L. J., Jawdat, O., Barohn, R. J., Gajewski, B. J., He, J., & Statland, J. M. (n.d.). Using automated electronic medical record data extraction to model ALS survival and progression. <https://doi.org/10.1186/s12883-018-1208-z>
4. Sarkar, S., & Seshadri, D. (2014). Postgraduate Education. *Journal of Clinical and Diagnostic Research*, 8(9), 1-04. <https://doi.org/10.7860/JCDR/2014/8301.4806>
5. *Using the REDCap API*. (n.d.). Retrieved October 18, 2020, from <https://education.arcus.chop.edu/redcap-api/>