Leveraging Longitudinal Electronic Health Record Data to Reclassify Chronic Diseases

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Objective
To import longitudinal electronic health record (EHR) data for participants in the MURDOCK Community Registry and Biorepository, and reconcile these data with participant self-reported clinical information.

Background & Methods
The MURDOCK Study (Measurement to Understand the Reclassification of Disease of Cabarrus/Kannapolis) is a multi-tiered epidemiology study that aims to "re-write the textbook of medicine" by enabling better understanding of the molecular underpinnings of chronic diseases. The registry and biorepository are key components comprising clinical and demographic information and biospecimens for –omics analysis from 50,000 planned (nearly 7,800 currently enrolled) participants from Cabarrus County of Kannapolis, NC. Longitudinal clinical data are obtained by annual follow-up and access to EHRs through participant consent and partnership with local medical providers. Nearly 70% of participants receive health care services by major providers using enterprise EHR systems, and Meaningful Use incentives have led to increased adoption amongst independent providers.

A pre-identified set of system-specific data elements will be requested from each provider, and obtained in compliance with the institution’s patient information protection policies. Efforts will be made to obtain EHR data through the NC Health Information Exchange (NC HIE) for participating providers. Data will be imported into a protected staging environment for quality assurance and reconciliation prior to integration into the MURDOCK Integrated Data Repository.

Anticipated Results
A pilot effort to integrate EHR data for a subset of participants is underway and will inform subsequent transfers. Clinical data retrieved from EHRs will enrich the registry’s clinical dataset and validate self-reported clinical information.

Discussion
Increased adoption of certified EHR technology resulting from HITECH legislation presents an unprecedented opportunity for research through secondary use of EHR data. The MURDOCK Study seeks to address widely recognized technical challenges and privacy considerations to open doors for innovative epidemiological methods.

Clinical Validation Methods: Under Development

- Participant Self-reported
- Extracted from Participant EHR

- Objective & Repeatable Validation Criteria
  - Confirmatory
  - Suggestive
  - Disparate

- Participant/Patient Identification
  - Entity Resolution & Record Linkage
  - Aggregate Statistics on EHR System Data
  - Content, Format, Completeness

For more information on the MURDOCK Study please visit posters P173 and P341, and go to www.murdock-study.com online.