Session #9. Working with EHR Data Using VistAWeb, VINCi ChartReview Tool, and Joint Legacy Viewer
The objectives of this cyberseminar are to:

- Describe electronic health record (EHR) data and chart review methods
- Identify strategies and considerations for conducting chart review
- Discuss available tools to support electronic chart review activities (Joint Legacy Viewer, VistAWeb, and VINCI ChartReview Tool)
- Present research studies using EHR data and chart review methods
Session roadmap

• Introduce Function QUERI research study
• Strategies, considerations and methods for conducting chart review with EHR data
• Tools to support electronic chart review activities
• VINCI Chart Review Tool
• Where to go for more help
Poll Question #1

I am interested in chart review of VA electronic health record (EHR) data primarily due to my role as:

a. Research investigator
b. Research staff (project coordinator, data manager, programmer, research assistant)
c. Clinical staff
d. Operations staff
e. Other role
Poll Question #2

What is your previous experience using chart review for VA research?

a. Have never done chart review
b. Used paper charts
c. Used local electronic health record only (CPRS)
d. Used central chart review (VistAWeb, CAPRI or JLV)
e. Used some other platform for central chart review (please describe using the Q&A function)
Session roadmap

• Introduce Function QUERI research study
• Strategies, considerations and methods for conducting chart review with EHR data
• Tools to support electronic chart review activities
• VINCI Chart Review Tool
• Where to go for more help
Optimizing Function and Independence QUERI

PI: Susan N. Hastings

**STRIDE**
- Inpatient mobility program for hospitalized older Veterans
- 8 VA sites
- Cluster randomized trial

**iHI-FIVES**
- Caregiver support training program
- 8 VA sites
- Cluster-randomized trial

**Group PT**
- Group Physical Therapy for Knee Osteoarthritis
- 1 site (Durham VA)
- Local QI

Wang, Allen, Van Houtven et al, Imp Sci 2018
Optimizing Function and Independence QUERI

PI: Hastings

• Function QUERI is designed to
  • Evaluate implementation of Group PT, STRIDE, and iHI-FIVES
  • Examine impact on
    • **Independence**: Veteran discharge from the hospital to skilled nursing facility, hospital length of stay, days at home
    • **Function**: Function and Disability Instrument, health-related quality of life, depression, mobility in community, Zarit caregiver burden

https://www.queri.research.va.gov/programs/function.cfm
Session roadmap

• Introduce Function QUERI research study
• Strategies, considerations and methods for conducting chart review with EHR data
• Tools to support electronic chart review activities
• VINCI Chart Review Tool
• Where to go for more help
EHR Data

• Begin with idea of data need
  • Determine patient eligibility
  • Determine study outcomes related to independence
  • Determine service/utilization outcomes

• Then, how to access the EHR data?
  • Central data warehouse (CDW) vs chart review of individual records
EHR Data: What source?

- CDW (or other database)
  - National repository of VHA admin and clinical data
  - Relational database organized into data domains
  - Best for structured data, limited for unstructured/semi-structured data (text-type data)

- Chart Review
  - Capture data not available in CDW
  - Validate CDW data extraction strategies/algorithms
  - Assess selection of CDW data domains/tables
  - When real-time data is needed
Chart Review: Data not readily available in CDW

- Text-based data
  - Group PT (QI) – data in progress note text, such as reasons for class non-attendance
- STRIDE
  - Patient eligibility criteria - found in text fields such as progress notes
  - Discharge to nursing home outcome measure

- Scanned records and images
  - iHI-FIVES – days at home outcome: non-VA care records
Example: STRIDE eligibility criteria

- Eligibility criteria for patient sample includes:

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age $&gt;$ 60</td>
<td>CDW</td>
</tr>
<tr>
<td>Community dwelling prior to hospital admission</td>
<td>CDW + chart review + phone screen</td>
</tr>
<tr>
<td>On medical ward $&gt;$ 2 days</td>
<td>CDW</td>
</tr>
<tr>
<td>No bedrest order</td>
<td>CDW</td>
</tr>
<tr>
<td>Has decision making capacity</td>
<td>Chart review</td>
</tr>
<tr>
<td>No suicide flag</td>
<td>Chart review</td>
</tr>
<tr>
<td>No diagnosis of dementia</td>
<td>CDW</td>
</tr>
<tr>
<td>Able to ambulate prior to visit</td>
<td>Phone screen</td>
</tr>
</tbody>
</table>
Chart Review: Validate CDW data extraction

• Outcome assessment strategy
  - STRIDE outcome: discharge to skilled nursing facility
    - No CDW field captured disposition to non-VA facility
    - CDW consults table

• Patient eligibility criteria
  - STRIDE bedrest order example
    - CDW orders table
Function QUERI: STRIDE

Chart review validation of CDW data: bedrest order

1. CDW data pull
2. VistAWeb chart review
3. Assess results
4. Consultation with site
5. Refine CDW algorithm and parameters (no bedrest order for ≥2 days)
6. Re-assess results
Chart Review: Other reasons

• Assess selection of CDW data domains/tables
  • E.g., a completed consult or appointment
  • Function QUERI example: Group PT class appts
    • Cross-check of CDW domain selection
    • 30% undercount
• Data about complex aspects of care/clinician judgment
  • E.g., care coordination between providers
• When real-time data is needed
  • E.g., to check patient status before contacting
Session roadmap

- Introduce QUERI research study
- Strategies, considerations and methods for conducting chart review with EHR data
- Tools to support electronic chart review activities
- VINCI Chart Review Tool
- Where to go for more help
Chart Review of EHR data: What tool?

• What level of data is needed? Where is the study population?
  • Local facility - CPRS
  • VISN or National level – central chart review

• How many sites are to be studied, and are there study staff at the site?
  • Local site, or a few non-local sites
    • Study staff there – CPRS
    • No study staff there – central chart review
  • Several sites – central chart review
Tools for electronic central chart review

**VistAWeb**
- Developed to facilitate sharing of individual patient data among patient’s providers at other VAMCs
- Read-only access to patient data at all VA sites where received care, organized chronologically
- Scheduled to be decommissioned

**Joint Legacy Viewer (JLV)**
- User-friendly interface (widgets)
- Can customize screen with widgets; sort, filter, save views; reports
- Better organized and integrated info
- Button for JLV from CPRS (used to be VistAWeb)
- Potential drawback – lag time at startup and toggling between widgets

**CAPRI**
- Developed to facilitate coordination between Veteran Benefits and Veteran Health Administration
VistAWeb – login page

Welcome to VistaWeb

Getting Started
First you must choose a site to log onto. This must be a site at which you have an account, i.e., access and verify codes. Do this by clicking on the + sign next to your VISN, then clicking on your site. That will get you a login page.

VistAWeb is an alternative application for obtaining remote data and does not replace RDV nor contain all the information now available through RDV.

In case of any problem, please contact your local IRM / Computer support staff or IT Help Desk.

VistaWeb is a product of the Office of Information.

Version 16.1.8  Build last updated: 7/7/2016
JLV – patient portal
VistAWeb – JLV mapping

Data Mapping: From VistAWeb to JLV

https://vaww.oed.portal.va.gov/pm/iehr/vista_evolution/JLV
Accessing EHR Tools

• Research: Complete a DART request
  • Ensure data sources, locations, tools included in IRB protocol submission
  • Specify “national electronic health records” (and in HIPAA waiver, too)

• Operations/QI: Through NDS
  • Mention operational partner in project description
  • Request national vs site specific access

• More info and instructions on VHA Data Portal
  • http://vaww.vhadataportal.med.va.gov
Procedures for Screening Patients with Chart Review

1. Start with eligibility criteria, operationalize
2. Obtain necessary data permissions through DART (research) or NDS (Operations)
3. Determine which criteria is identifiable through CDW vs chart review
4. Conduct comprehensive chart review on pilot sample
5. Streamline chart review using confirmatory analysis of items to drop from chart review (CDW, phone screen)
6. Develop user guide, train staff and perform QC checks
## Function QUERI: STRIDE
### Chart Review User Guide

<table>
<thead>
<tr>
<th>Exclusion Criteria</th>
<th>VAMC #1</th>
<th>VAMC #2</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Death</strong></td>
<td>Select “Patient Information” tab, then select “patient inquiry”, scroll down to death information section</td>
<td>Select “Patient Information” tab, then select “patient inquiry”, scroll down to death information section</td>
</tr>
<tr>
<td><strong>Index admission was transfer in from another hospital</strong></td>
<td>Select “Visits and admissions” tab then select “transfers” to view recent transfers</td>
<td>Select “Visits and admissions” tab then select “transfers” to view recent transfers</td>
</tr>
<tr>
<td><strong>Lacks decision-making capacity (past 1 yr)</strong></td>
<td>Select “Progress notes’ tab, select and search the “Nursing admission assessment” note for a neurological assessment to find a statement about decision making capacity. If nothing is found; assume DMC is intact. (Note: Check the “Wandering Risk Assessment” within the nursing admission assessment note)</td>
<td>Select “Progress notes’ tab, select and search the “Emergency Department Nursing Note” for a neurological assessment to find a statement about DMC. OR Search for “NUR Admission Database”. If nothing is found; assume DMC is intact.</td>
</tr>
<tr>
<td><strong>Current high-risk suicide flag</strong></td>
<td>Select “Other notes” tab, then select “clinical warnings” section. Search section for high risk of suicide flag.</td>
<td>Select “Other notes” tab, then select “clinical warnings” section. Search section for high risk of suicide flag.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Outcome</th>
<th>VAMC #1</th>
<th>VAMC #2</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Where was the patient discharged to?</strong></td>
<td>Select “Discharge summaries” tab then search through most recent discharge note to find to “discharge location”</td>
<td>Select “Visits and admissions” tab then select “Discharges” to find relevant discharge date. Location will be found under “disposition place” section of note.</td>
</tr>
</tbody>
</table>
Lessons Learned

• Chart review is best way to collect complex clinical chart data
• Allot time at the beginning of study to determine best methods for EHR data extraction and validation of findings
• Detailed chart review user guide - key to standardize review and increase efficiency
• Central chart review may take a bit more time than CPRS
• Split up chart review duties if possible on team; good chunked task
Session roadmap

• Introduce QUERI research study
• Strategies, considerations and methods for conducting chart review with EHR data
• Tools to support electronic chart review activities
• VINCI Chart Review Tool
• Where to go for more help
Poll Question #3

Have you ever used the VINCI ChartReview tool for research?

a. Umm what’s the VINCI ChartReview tool?
b. I’ve heard of it, but I’ve never used it.
c. Yes, I have used it a few times.
d. Yes! I use it all the time.
Poll Question #4

What has been the largest barrier to conducting research in the VA?

a. Lack of knowledge of tools and resources
b. Access to data/ environment issues
c. Haven’t had the need or chance to conduct research in the VA
d. No problems or barriers
Abstraction vs. Annotation

**Abstraction**
- Summation of all parts (less granular)
- High level capture
- Can include information from annotation

**Annotation**
- Detailed information (more granular)
- Captured concept by concept
- Can have associated additional information
ChartReview: Functionality

- Multiple Levels of Classification
  - Patient Level
  - Document Level
  - Text within Document Level
  - Event Level
  - Instance Level

- Writes to database
- Reusable created elements and schemas
- Evaluation tool based abstraction and annotation
- Exportable reports
- Enhanced project management
DEFINE concepts and variable

SELECT annotation tool

RECORD selection

DEVELOP guidelines

MEASURE annotation/abstraction quality

TRAIN & MANAGE annotation/abstraction

IDENTIFY annotator/abstractors required qualifications

ChartReview: Recommended Process

- IRR (Inter-Rater Reliability)
- IAA (Inner Annotator Agreement)
- Kappa coefficient
ChartReview: Projects Examples

Colonoscopy
Reviewed Colonoscopy and adenoma data across multiple documents per patient

Peripheral Artery Disease (PAD)
Analysis of multiple data sources to determine PAD, amputation, revascularization status

AQual (Alcohol Quality Measures)
multiyear study of the link between improvements in processes of care for alcohol misuse and improvements in outcomes

Travel History
Capture for NLP development mentions of travel and its correlation with Zika Virus, dengue virus, and chikungunya virus
Session roadmap

- Introduce QUERI research study
- Strategies, considerations and methods for conducting chart review with EHR data
- Tools to support electronic chart review activities
- VINCI Chart Review Tool
- Where to go for more help
Additional Resources
VINCI Services

- Concierge
- Data Provisioning
- Compliance
- Feasibility
- Recruitment
- **Annotation/ChartReview**
- Natural Language Processing
- Analytics and Data Services
- Application Development

VINCI@va.gov
VINCIServices@va.gov

06/2018
VIReC Options for Specific Questions

<table>
<thead>
<tr>
<th>HSRData Listserv</th>
<th>HelpDesk</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Community knowledge sharing</td>
<td>• Individualized support</td>
</tr>
<tr>
<td>• ~1,300 VA data users</td>
<td><a href="mailto:virec@va.gov">virec@va.gov</a></td>
</tr>
<tr>
<td>• Researchers, operations,</td>
<td>(708) 202-2413</td>
</tr>
<tr>
<td>data stewards, managers</td>
<td></td>
</tr>
<tr>
<td>• Subscribe by visiting</td>
<td></td>
</tr>
<tr>
<td><a href="http://vaww.virec.research.va.gov/Support/HSRData-L.htm">http://vaww.virec.research.va.gov/Support/HSRData-L.htm</a> (VA Intranet)</td>
<td></td>
</tr>
</tbody>
</table>
### Quick links for VA data resources

<table>
<thead>
<tr>
<th>Resource</th>
<th>URL</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>VIReC:</td>
<td><a href="http://vaww.virec.research.va.gov/Index.htm">http://vaww.virec.research.va.gov/Index.htm</a></td>
<td>(VA Intranet)</td>
</tr>
<tr>
<td>CDW:</td>
<td><a href="https://vaww.cdw.va.gov/Pages/CDWHome.aspx">https://vaww.cdw.va.gov/Pages/CDWHome.aspx</a></td>
<td>(VA Intranet)</td>
</tr>
</tbody>
</table>
Contact information

Susan Nicki Hastings, MD, MHS
Susan.Hastings@va.gov

Elizabeth Mahanna, MPH
Elizabeth.Mahanna@va.gov

Daniel Denhalter, MSPH
Daniel.Denhalter@va.gov

VA Information Resource Center
virec@va.gov
708-202-2413
Next session:
Monday, July 9th at 1pm ET

Database & Methods Cyberseminar Series

Phenotyping Physiologic Measurement of Lung Function in the VA EHR Using Automated Tools

Kathleen Akgün, MD, MS
VA Connecticut Healthcare System
Yale School of Medicine