Childhood Cancer Data Initiative Webinar Series

Unlock the Power of Unstructured Data with Electronic Medical Record Search Engine (EMERSE)

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January 14, 2025

Agenda

1. *Background*
2. *EMERSE Solution*
3. *EMERSE Value*
4. *EMERSE Capabilities and Features*
5. *Getting EMERSE*
6. *CCDI Example*
7. *Q&A*

Today's Speaker

David Hanauer, M.D., M.S.

Associate Professor, University of Michigan

Background

EMERSE is for Free Text Data

EMERSE is for this…	**…not this**	
Unstructured Data (free text)	*Structured Data*	
Mrs. Jones is a 56-year-old female with a history of HTN, hypercholesterolemia, and T2DM who comes to the clinic today with a 3-day h/o dizziness and a severe headache on the left side.	WBC: Cholesterol: Weight: AST: ALT:	5.6 182 67.4 30 52

Free Text Notes Are Important for Research

- 80% of electronic health record (EHR) data are unstructured free text
- Numerous studies have shown the importance of free text for accurate and complete data extraction
- Most medical centers lack tools for free text, especially tools that are used by non-technical experts

EMERSE Solution

The EMERSE Solution

- A system “for the people”
- Users search the EHR notes on their own
- Don’t need to wait in a queue for an analyst or a data scientist
- Easy-to-use for non-technical users
- Unlike with some EHRs, EMERSE can search across all notes and all patients at once
- Continuous refinements for 19 years

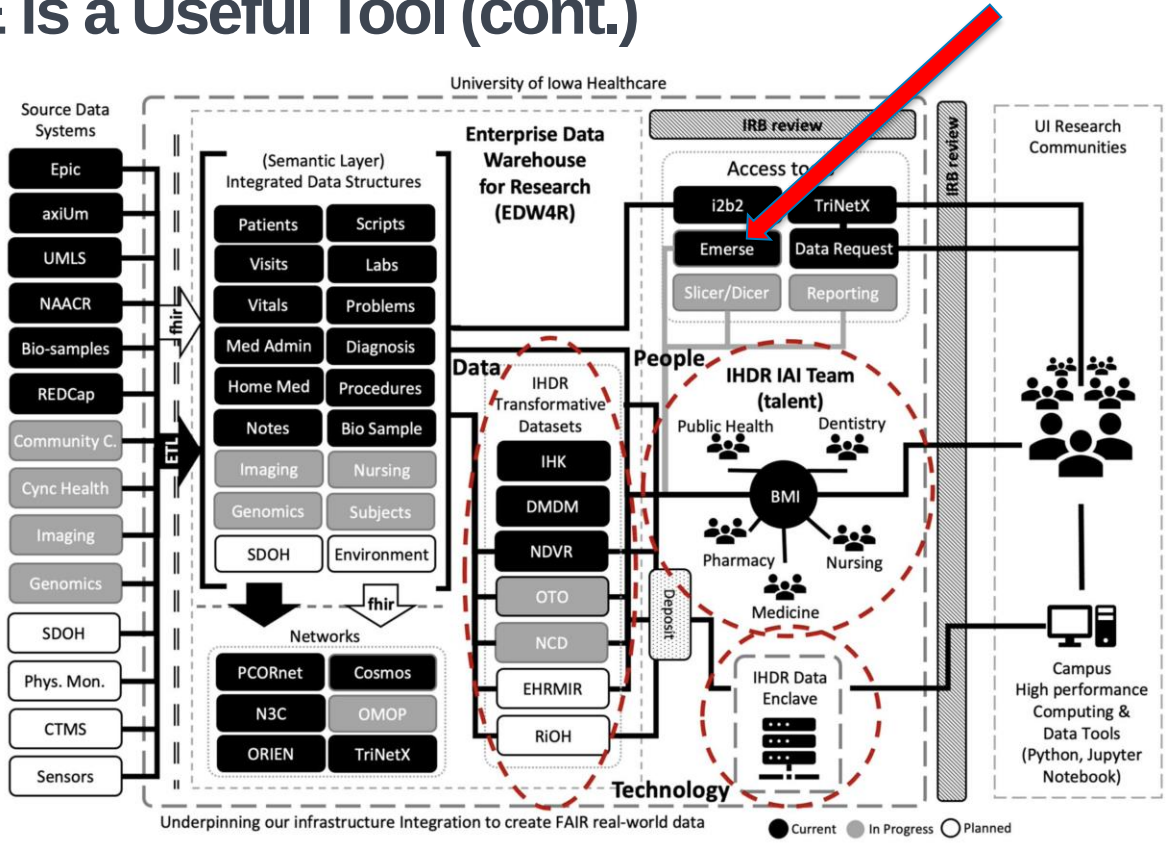
The EMERSE Solution (cont.)

- A system “for IT teams”
- Enterprise grade, easy to support
- Configurable with granular roles/privileges to control access (e.g., all patients vs. some patients)
- Data are kept secure within a centralized, audited system at your own site
- No need to download/store the data elsewhere

EMERSE Is a Useful Tool

EMERSE will likely be one of many tools you need to build and support your project(s)

EMERSE is a Useful Tool (cont.)



https://pmc.ncbi.nlm.nih.gov/articles/PMC10873835/

EMERSE Value

We Think EMERSE Is Really Good

- **We think it is better** than other tools that cost money
- **We've been laser-focused** on just this one feature: *search*
- **We've studied it:** "New users of the EMERSE system are...highly satisfied with the interface and have highly positive perceptions of its expected utility in their work"
- **Our users tell us:** "EMERSE is an absolute gem. Thank you to the team that created this powerful research tool."

We Think EMERSE Is Really Good (cont.)

- **Publications mention it:** “The tool avoids the pitfalls of diagnostic inaccuracy seen with tools querying on ICD and billing codes...” [PMID 36114099]
- **Top-tier medical centers use it:** University of Michigan, Harvard University – Dana Farber Cancer Center, Columbia University Cancer Center, University of North Carolina – Chapel Hill, University of California – San Francisco, and more

EMERSE Capabilities and Features

EMERSE Can Support Multiple Research Activities

- **Finding cohorts based on what is mentioned in notes:** disease, drugs, symptoms, adverse events, etc.
- **Search through existing patient lists:** just copy-paste in a list of medical record numbers (MRNs) and start searching
- **Highlighting search terms in clinical notes** to support chart reviews

EMERSE Supports Research

- ~700 peer-reviewed papers and abstracts
  - Full list: https://project-emerse.org/publications.html

EMERSE Is Highly Refined

- **It's fast:** up to 7,000 times faster than searching text in a traditional database
- **It provides many query expansion options:** cancer → tumor, neoplasm, carcinoma, malignancy, etc.
- **It provides multiple management features** such as saved patient lists, saved search terms, multiple filtering options, sharing lists and terms among team members, and more

Natural Language Processing (NLP) Capabilities

- NLP is built in
  - Named entity recognition/mapping to the Unified Medical Language Systems (UMLS) concept unique identifiers (CUIs)
  - Negation
  - Subject vs. non-subject
  - Uncertainty
  - History of
- Sites can incorporate their own NLP annotations

Getting EMERSE

Cost

- Software $0.00
- Installation Guidance $0.00
- Access to Documentation $0.00
- Training (within reason) $0.00
- Synonyms dataset (optional) $0.00*

**for research use within EMERSE*

The Fine Print

- Sites must install the software and operate it themselves
- Installation can be local or cloud
- Site pay their own local/cloud installation costs
- Our team does not have access to anyone else’s data

EMERSE Team

- Contact us to schedule a time with your team for:
  - Discussions about usage strategies
  - Training
  - Live demonstrations (for abstractors, IT teams, etc.)
  - Technical/implementation details
- Email: **EMERSE-team@umich.edu**

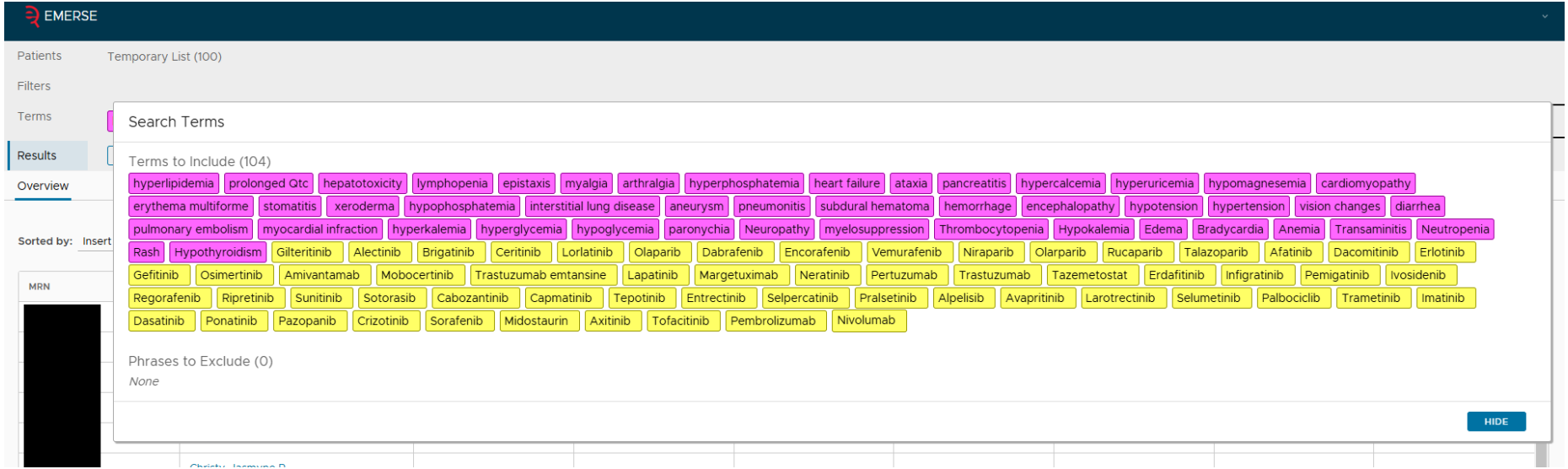
EMERSE Community Meeting

- Online via Zoom; open to everyone
- Next meeting: **Monday, February 10, 2025, 1:00–2:00 p.m. ET**
- Register at: https://bit.ly/emerse-community-feb-2025

CCDI Example

CCDI Program Example

- Search for multiples drugs and toxicities



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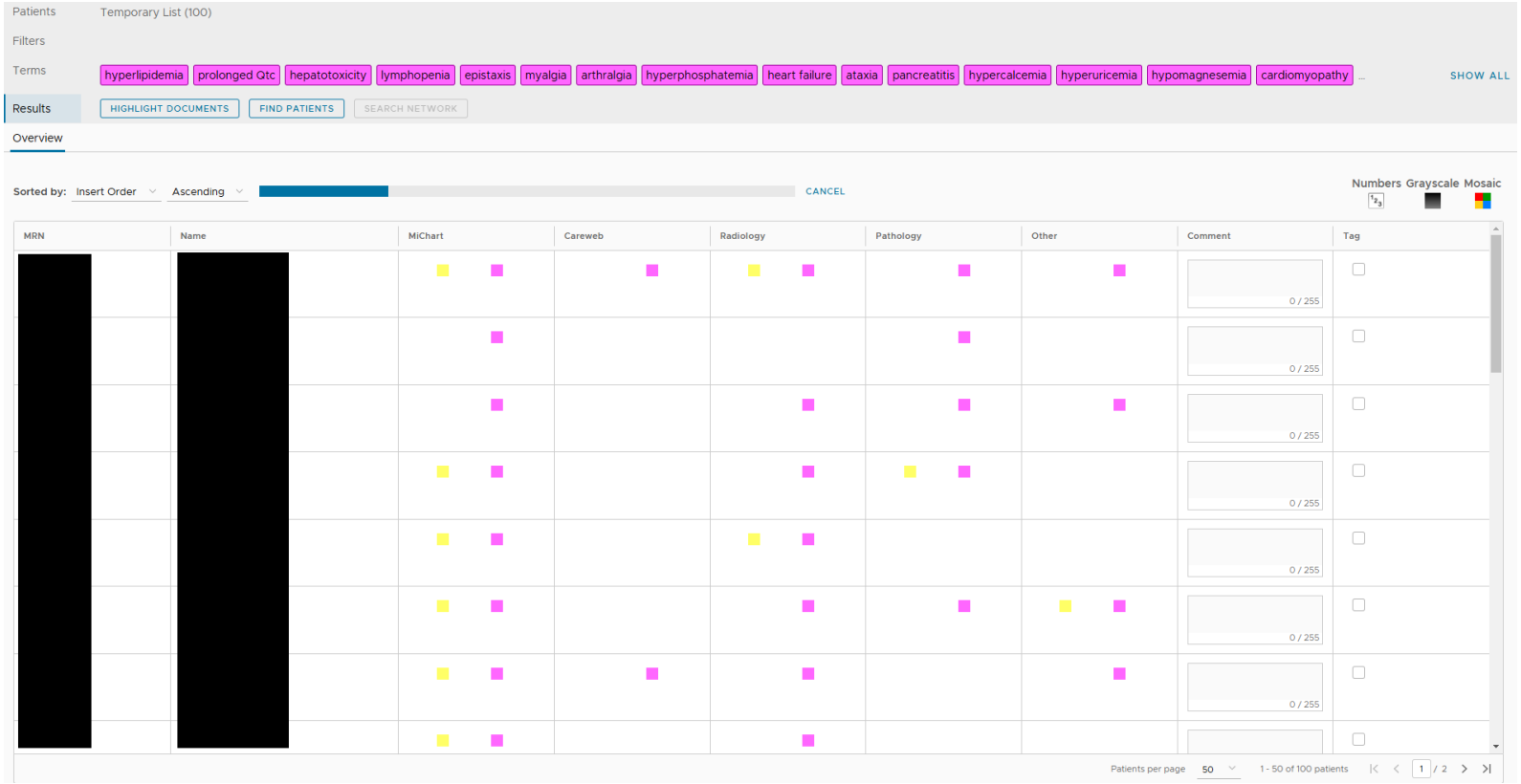

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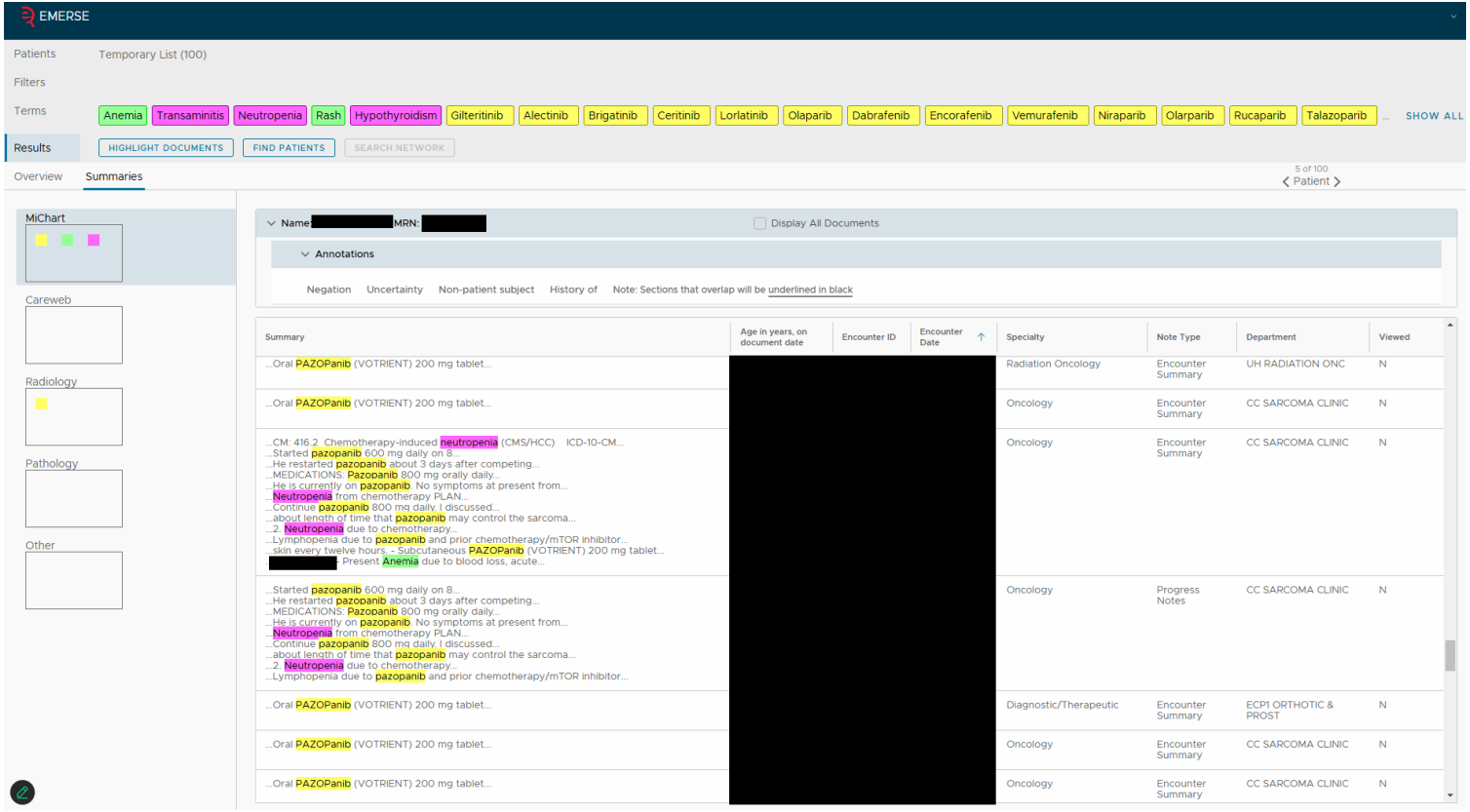

Live Demo

- No real names
- No PHI
- Publicly available
- “Documents” are abstracts and case reports

Q&A

How You Can Engage with CCDI

Learn about CCDI and subscribe to our monthly newsletter:
cancer.gov/CCDI

Access CCDI data and resources:
ccdi.cancer.gov

Questions? Email us at:
NCIChildhoodCancerDataInitiative@mail.nih.gov

Thank you for attending!

cancer.gov

cancer.gov/espanol