EMERSE Community Meeting

2026-May-06

https://project-emerse.org

Plan for today

- Welcome and Housekeeping
- Announcements
- Guest Speakers: Tyler G. James, PhD, MCHES & Logan Roberts, MS, CHES
  - **“Reducing Chart Review Burden with EMERSE: Lessons from CHARGE Syndrome Computable Phenotyping”**
- Software Updates
- Open Forum
- Adjourn

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Housekeeping

- Zoom *Meeting*
  - More opportunities for interaction
- Please stay muted, unless you would like to ask a question or make a comment
- Feel free to use the chat function to type questions or provide comments
- We will answer questions throughout
- We will record this meeting; it will be available where prior recordings are located:
  - https://project-emerse.org/presentations.html
  - https://project-emerse.org/community.html

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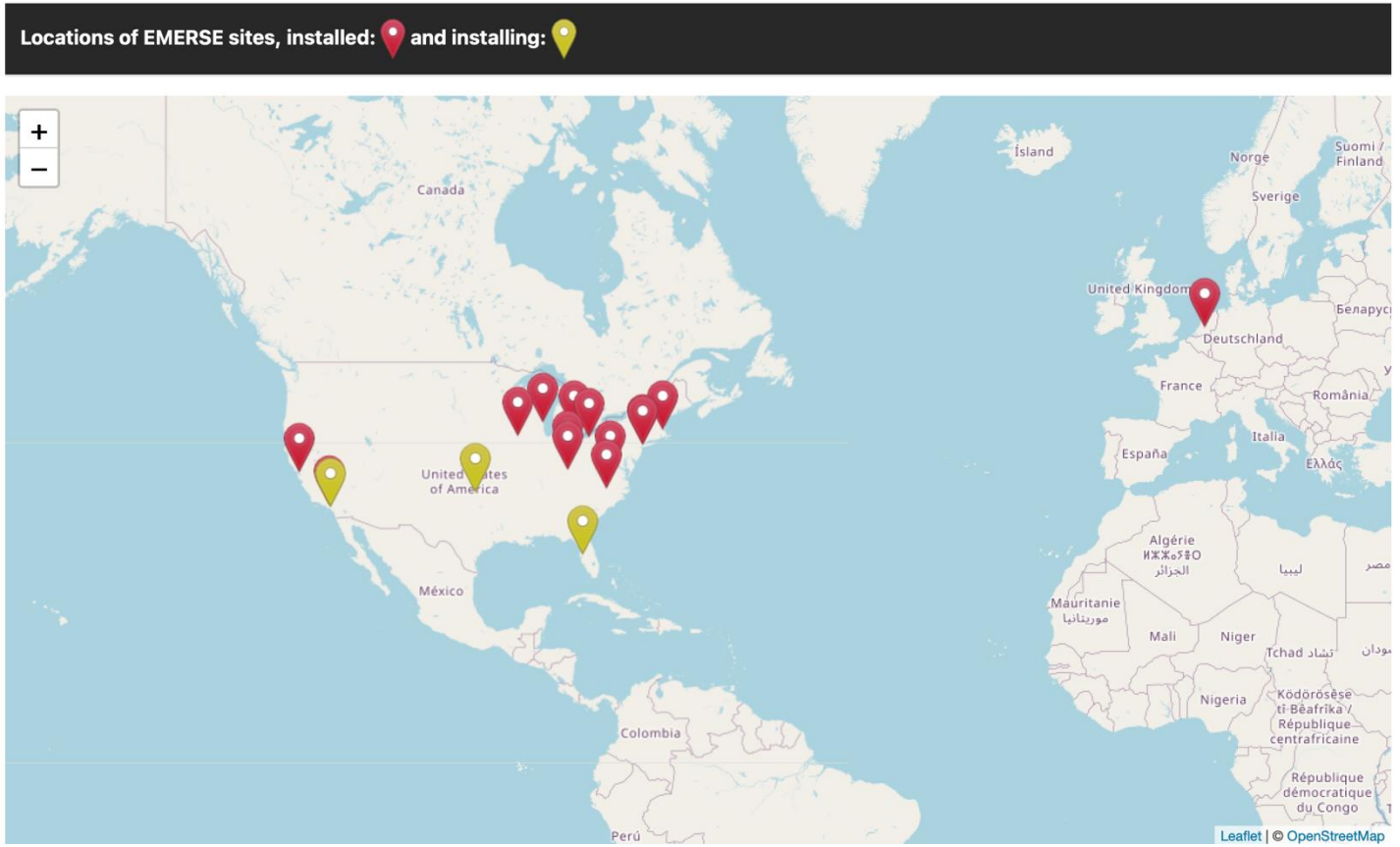
Community

- https://project-emerse.org/community.html



Acknowledgements

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  - NCI ITCR program
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    - Health Information Technology & Services
    - Rogel Cancer Center

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Publications Using EMERSE

since our last community meeting in Nov 2025

30 papers

5 abstracts

Full list here: https://project-emerse.org/publications.html

AMIA Amplify Meeting May 19-20, 2026

User Perspectives on Integrating Large Language Models into EMERSE

David A. Hanauer, MD, MS[1], Kai Zheng, PhD[2]
[1]University of Michigan, Ann Arbor, MI; [2]University of California–Irvine, Irvine, CA

Introduction

As large language models (LLMs) transform clinical and research workflows, understanding their potential to enhance tools like the Electronic Medical Record Search Engine (EMERSE) is critical. To ensure responsible and effective LLM integration into EMERSE, we surveyed users on their perceptions, expectations, and concerns regarding LLMs in EMERSE. These insights are essential to guide future development for supporting clinicians and researchers.

'Vibe Coding' is Viable Option for Boosting Software Development Productivity and Enhancing Capabilities in Clinical Research Software

David A. Hanauer, MD, MS[1], Lisa Ferguson, MS[1], Kellen McClain[1], Guan Wang, MS[1]
[1]University of Michigan, Ann Arbor, MI

Introduction

The term 'vibe coding' was coined in February 2025, and refers to an informal, iterative approach to software coding in which a person describes their desired product to a large language model (LLM) and the LLM produces code intended to meet those requirements. This approach could be beneficial during the initial phase of software development, enabling rapid brainstorming sessions and multiple cycles of prototyping. Here we discuss our experience with vibe coding for a new feature we developed for the electronic medical record search engine (EMERSE) software, which is an enterprise-level text processing tool used at academic medical centers nationwide.

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Research Letter | Health Informatics

Emoji Use in the Electronic Health Record

David A. Hanauer, MD, MS; Gavin C. Raab, BS; Shira N. Hanauer; Lisa Ferguson, MS; Kellen McClain, BSE; Guan Wang, MS; Michelle Rozwadowski, BS; Sung W. Choi, MD, MS

Introduction

Emojis are small digital images that visually express emotions, ideas, or concepts. Their use has been reported in health care settings, such as texting between clinicians,[1] but we are unaware of studies characterizing emojis within electronic health record (EHR) clinical notes, including patient portal messages.

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Smiling face with smiling eyes (n = 1772)	Telephone receiver (n = 544)	Calendar (n = 429)	Prohibited (n = 419)	Eye (n = 411)
Maple leaf (n = 382)	Bathtub (n = 352)	Briefcase (n = 351)	Busts in silhouette (n = 350)	Memo (n = 339)
Slightly smiling face (n = 223)	Rainbow (n = 174)	Pill (n = 85)	Droplet (n = 85)	Stethoscope (n = 82)
Headphone (n = 57)	Fire (n = 56)	Cooked rice (n = 55)	Winking face (n = 55)	Running shoe (n = 54)
Open book (n = 53)	Crescent moon (n = 51)	Brain (n = 45)	Round pushpin (n = 44)	Confused face (n = 40)
Test tube (n = 37)	Folded hands (n = 35)	Face with tears of joy (n = 32)	Fax machine (n = 31)	Hospital (n = 30)
Grimacing face (n = 29)	Person in lotus position (n = 28)	Backhand index pointing right (n = 27)	P button (n = 26)	Soap (n = 26)
Grinning face with sweat (n = 25)	Woman with light skin tone (n = 24)	Loudspeaker (n = 24)	Beaming face with smiling eyes (n = 23)	Crossed fingers (n = 23)
Disappointed face (n = 22)	Face with thermometer (n = 22)	Light bulb (n = 21)	Hot face (n = 21)	Thumbs up (n = 20)
Small blue diamond (n = 20)	Crying face (n = 20)	Red apple (n = 19)	Laptop (n = 19)	Police car light (n = 18)

Pause for Questions/Comments

Next up: Community member presentation

(followed by EMERSE v7.2 discussion)

Reducing Chart Review Burden with EMERSE: Lessons from CHARGE Syndrome Computable Phenotyping

Tyler G. James, PhD, MCHES &
Logan Roberts, MS, CHES

MICHIGAN MEDICINE
UNIVERSITY OF MICHIGAN

Acknowledgements

And disclosures

- **Collaborators:**
  - Brianna Marzolf, DO
  - Kim Blake, MD
  - Donna Martin, MD

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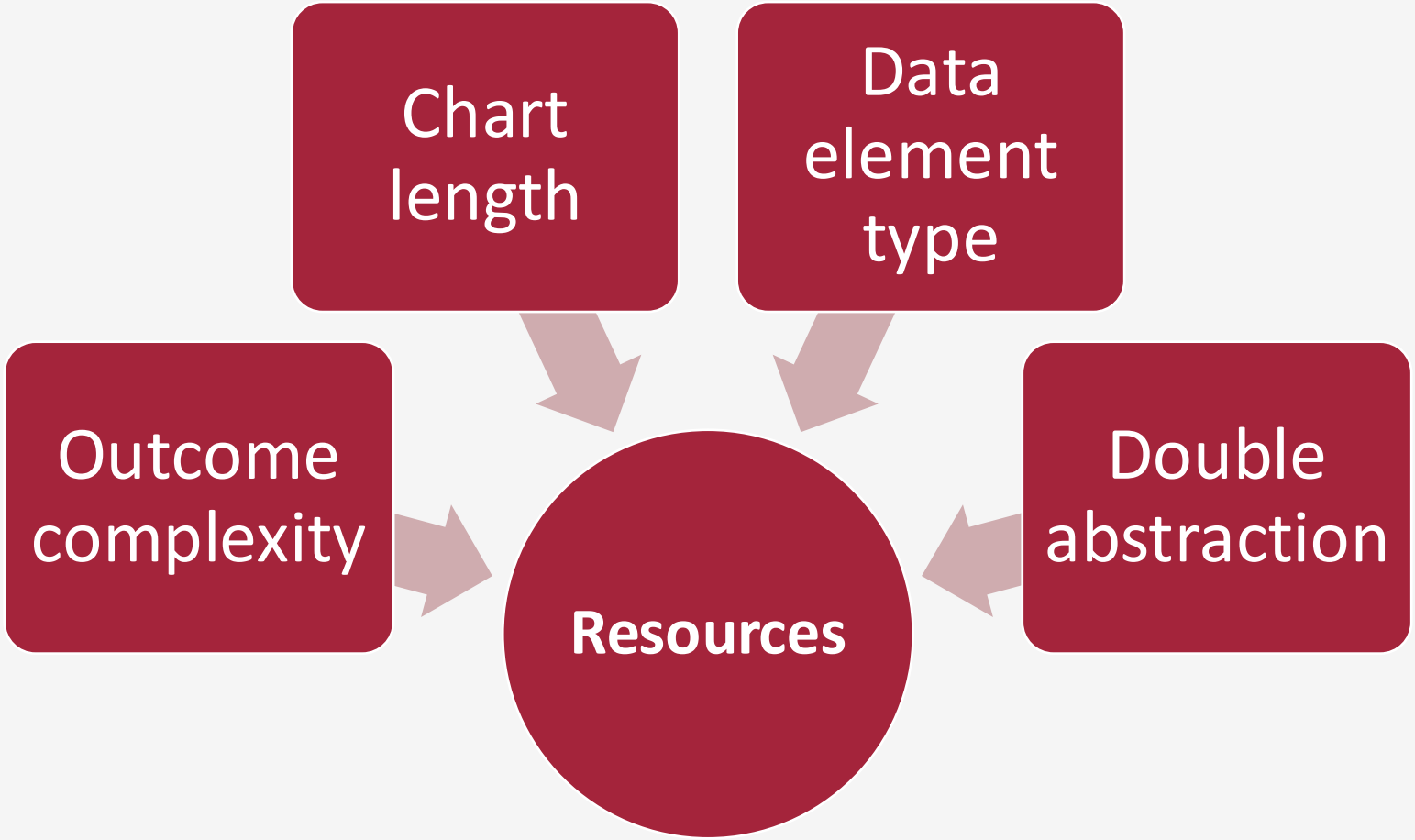
  - Vinod Vydiswaran, PhD
  - Tiffany Veinot, PhD
  - Michael McKee, MD, MPH
  - Symone Griffin

Our Context

Chart review is a resource intensive task



Rare Disease Clinical Trial Readiness

A priority for patient-centered research

Natural History

- Disease progression

Therapeutics

- Psychological and medical treatments

Clinical Trial Readiness

- Biomarker identification

Patient and Family Engagement

- Epidemiologic studies

CHD7

Chromodomain helicase DNA binding protein 7

- **CHD7 regulates the function of <u>other genes</u> that influence fetal development.**
- **Insufficient CHD7 protein increases risk of impact to heart, eye, ear, kidney, etc.**

Adapted from Hitzert & van Ravenswaaij-Arts (2023)

The Phenotypic Spectrum

If you know one person with CHARGE…

Source: Ravenswaaij-Arts, Hefner, Blake, & Martin (2022)

Understanding CHARGE Syndrome

The phenotypic spectrum

Vision

- Coloboma*
- Microphthalmos

Choanal atresia*

- Bony or membranous
- Atresia or stenosis
- Unilateral or bilateral
- Cleft palate

Cranial nerve*

- Facial palsy
- Swallowing problems / gut motility
- Sensorineural hearing loss
- Anosmia

CHARGE ear*

- Short, wide ear
- Semicircular canals
- Cochlea
- Ossicular malformations

Other

- Congenital heart defect
- Genital differences
- Language
- Insomnia
- Autistic-like behavior

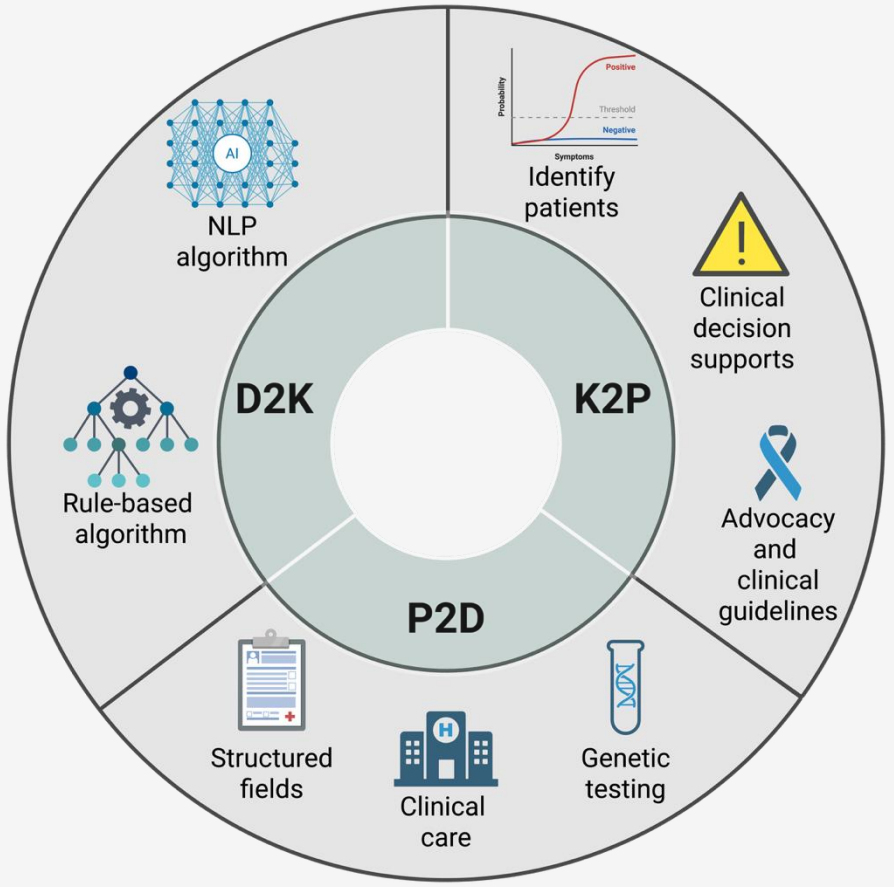
Major Diagnostic Criteria for CHARGE

Primarily a clinical diagnosis

Criteria	Blake et al. (1998)	Verloes (2005)	Hale et al. (2016)
Coloboma	✓	✓	✓
Choanal atresia	✓	✓	✓ (inc. cleft palate)
Characteristic ear abnormalities	✓	✓ (semicircular canals)	✓
Cranial nerve dysfunction	✓	(minor)	(minor)
Pathogenic CHD7	N/A	N/A	✓

Learning Cycle Informatics

Requires infrastructure



Identifying Patients with CHARGE

A priority and challenge

ICD-9-CM	ICD-10-CM	ICD-11	SNOMED
759.89	Q87.8	5A61.0	47535005
Other specified congenital anomalies	Other specified congenital malformation syndromes, not elsewhere classified	Hypopituitarism	CHARGE syndrome

Development of a Rule-based Phenotype

Methods

Identify the phenotype.

- Diagnostic criteria.

Define the algorithm.

- Features of CHARGE based on ICD-9-CM, ICD-10-CM, and CPT codes.

Validate the algorithm.

- Do those identified as having CHARGE have CHARGE?

Rule-based Phenotype for the Blake Criteria

- If **4 major** OR **3 major + at least 3 minor**
  THEN “Definite” (code as 2)
- If **1 or 2 major + at least 3 minor**
  THEN “Probable” (code as 1)
- Else: “None” (code as 0)

Blake Diagnostic Criteria
Major
• COLOBOMA-MICROPHTH • ANATOMIC-CHOANAL-ATRESIA • CN-01-OLFACTORY **OR** CN-02-OPTIC **OR** CN-03-OCULOMOTOR **OR** CN-04-TROCHLEAR **OR** CN-05-TRIGEMINAL **OR** CN-06-ABDUCENS **OR** CN-07-FACIAL **OR** CN-08-VESTIBULOCOCHLEAR **OR** CN-09-10-GASTRO **OR** CN-10-VAGUS **OR** CN-11-ACCESSORY **OR** CN-12-HYPOGLOSSAL • MIDDLE-EXTERNAL-EAR **OR** SNHL **OR** (ICD10 = Q16.5 / ICD9 = 744.05)
Minor
• GENITAL-HYPOPLASIA • IDD • CARDIOVASCULAR • ANATOMIC-CLEFT-PALATE • ANATOMIC-TRACHEO-STENOSIS

Defining the Rule-based Phenotype

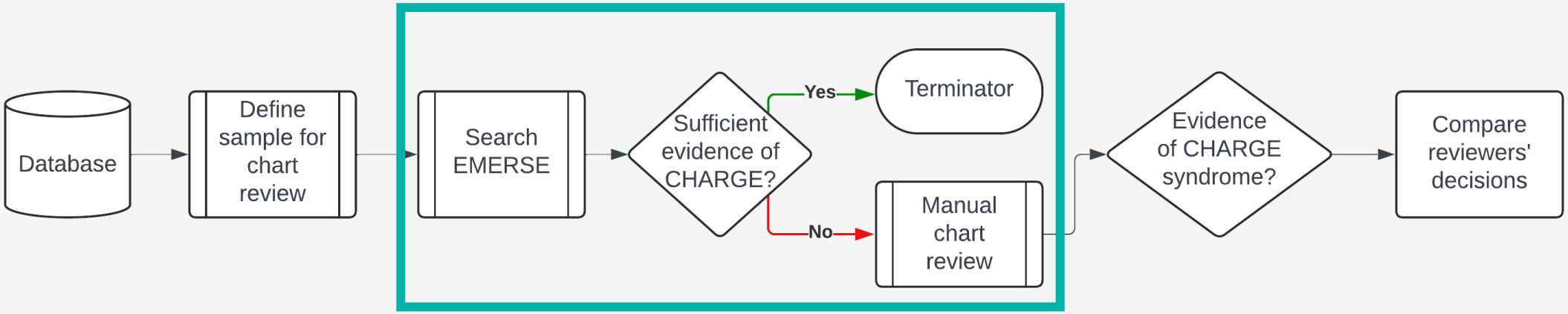
Example of our spreadsheets

HPO Term ID	HPO Descriptor	Description	Criteria Source	ICD-9-CM	ICD-9-CM Description	ICD-10-CM Code	ICD-10-CM Description
HP:0000589	Coloboma	Coloboma - Other specified congenital anomalies of iris and ciliary body		743.46	Other specified congenital anomalies of iris and ciliary body	Q13.0	Coloboma of iris
HP:0000589	Coloboma	Coloboma - Other specified congenital anomalies of iris and ciliary body		743.46	Other specified congenital anomalies of iris and ciliary body	Q13.2	Other congenital malformati
HP:0000589	Coloboma	Coloboma - Congenital anomalies of corneal size and shape		743.41	Congenital anomalies of corneal size and shape	Q13.4	Other congenital corneal ma
HP:0000589	Coloboma	Coloboma - Congenital malformation of eye		743.44	Specified congenital anomalies of anterior chamber, chamber angle, and related structures		
HP:0000589	Coloboma	Coloboma - Congenital malformation of anterior segment		743.44	Specified congenital anomalies of anterior chamber, chamber angle, and related structures	Q13.8	Other congenital malformati
HP:0000589	Coloboma	Coloboma - Congenital malformation of anterior segment		743.44	Specified congenital anomalies of anterior chamber, chamber angle, and related structures	Q13.9	Congenital malformation of a
HP:0000589	Coloboma	Coloboma - Congenital anomalies of anterior segment		743.49	Other congenital anomalies of anterior segment		
HP:0000589	Coloboma	Coloboma - Coloboma of lens		743.36	Congenital anomalies of lens shape	Q12.2	Coloboma of lens
HP:0000589	Coloboma	Coloboma - Coloboma of optic disc		377.23	Coloboma of optic disc	H47.319	Coloboma of optic disc, uns
HP:0000589	Coloboma	Coloboma - Coloboma of optic disc		377.23	Coloboma of optic disc	H47.313	Coloboma of optic disc, bilat
HP:0000589	Coloboma	Coloboma - Coloboma of optic disc		377.23	Coloboma of optic disc	H47.311	Coloboma of optic disc, righ
HP:0000589	Coloboma	Coloboma - Coloboma of optic disc		377.23	Coloboma of optic disc	H47.312	Coloboma of optic disc, left
HP:0000589	Coloboma	Coloboma - Coloboma of optic disc		377.23	Coloboma of optic disc	H47.31	Coloboma of optic disc
HP:0000589	Coloboma	Coloboma - Fundus coloboma		743.52	Fundus coloboma	Q14.8	Other congenital malformati
HP:0000589	Coloboma	Coloboma - Other congenital anomalies of posterior segment		743.59	Other congenital anomalies of posterior segment		
HP:0000589	Coloboma	Coloboma - Congenital malformation of optic disc		743.57	Specified congenital anomalies of optic disc	Q14.2	Congenital malformation of c
HP:0000589	Coloboma	Coloboma - Congenital lens malformation		743.36	Congenital anomalies of lens shape	Q12.8	Other congenital lens malfor
HP:0000589	Coloboma	Coloboma - Congenital lens malformation		743.39	Other congenital cataract and lens anomalies	Q12.9	Congenital lens malformatio
HP:0000589	Coloboma	Coloboma - Congenital deformity of eyelid		743.62	Congenital deformities of eyelids		
HP:0000589	Coloboma	Coloboma - Congenital anomaly of eyelid		743.63	Other specified congenital anomalies of eyelid		
HP:0000589	Coloboma	Coloboma - Congenital anomaly of eyelid		743.69	Other congenital anomalies of eyelid, lacrimal system, and orbit		
HP:0000589	Coloboma	Coloboma - Congenital malformation of eyelid				Q10.3	Other congenital malformati
HP:0000568	Microphthalmia	Coloboma - Microphthalmia	Hartshorne, T. et	743.10	Microphthalmos, unspecified		
HP:0000568	Microphthalmia	Coloboma - Microphthalmia	Hartshorne, T. et al. CHARGE Syndrome 2nd Edn (pg 23)			Q11.2	Microphthalmos
HP:0000568	Microphthalmia	Coloboma - Microphthalmia	Hartshorne, T. et	743.06	Cryptothalmos		
HP:0000568	Microphthalmia	Coloboma - Microphthalmia		743.11	Simple microphthalmos		
HP:0000568	Microphthalmia	Coloboma - Microphthalmia		743.12	Microphthalmos associated with other anomalies of eye and adnexa		

Blake	Verloes	Hale	Cases	MMCHARGE	Selection	Total
Definite	Typical	Yes	75	29	75	75
Definite	Partial	Yes	0	0	-	0
Definite	Atypical	Yes	205	15	205	205
Definite	None	Yes	1	0	1	1
Definite	Typical	No	0	0	-	0
Definite	Partial	No	0	0	-	0
Definite	Atypical	No	21	3	21	21
Definite	None	No	1	0	1	1
Probable	Typical	Yes	1	0	1	1
Probable	Partial	Yes	1	0	1	1
Probable	Atypical	Yes	112	4	40	43
Probable	None	Yes	612	5	15	20
Probable	Typical	No	0	0	-	0
Probable	Partial	No	0	0	-	0
Probable	Atypical	No	91	3	4	7
Probable	None	No	1,756	5	15	20
None	Typical	Yes	40	2	40	40
None	Partial	Yes	14	0	14	14
None	Atypical	Yes	391	8	20	28
None	None	Yes	2,333	2	40	42
None	Typical	No	0	0	-	0
None	Partial	No	0	0	-	0
None	Atypical	No	458	10	7	17
None	None	No	2,132,233	24	0	24

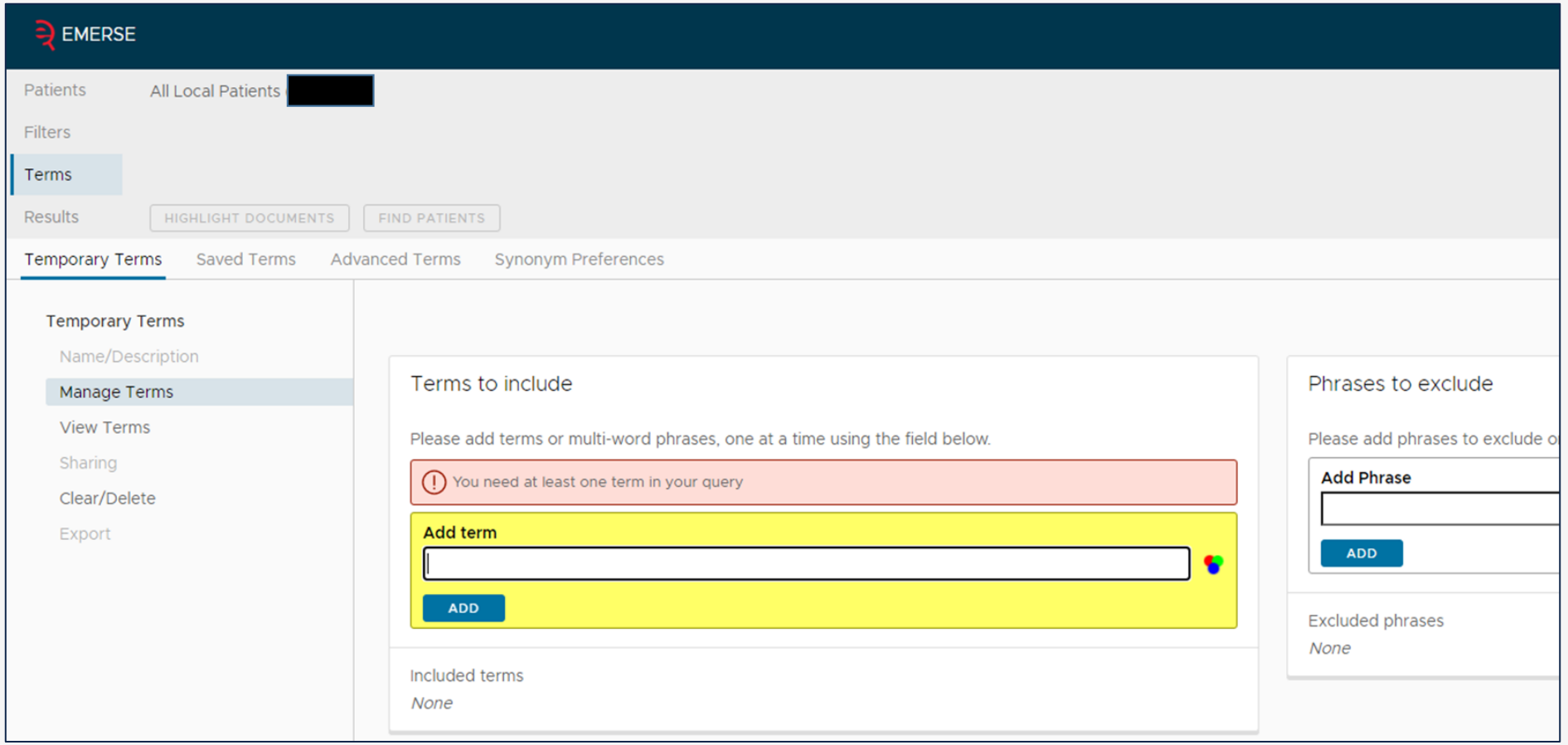
The Chart Review Process

Simplified



Using EMERSE to Search Records

EMERSE main screen



Source: Project EMERSE

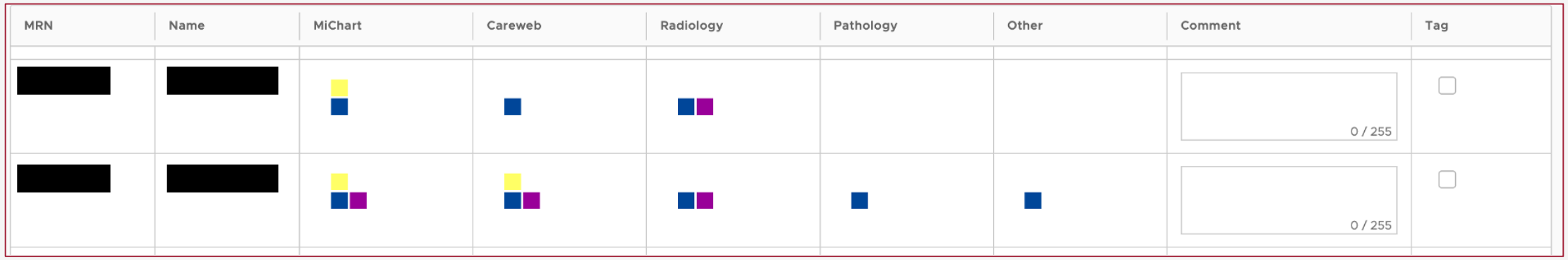
Using EMERSE to Search Records

Inputting search terms

CHD7	CHARGE syndrome	Semicircular canals
• CHD7 • Deletions of CHD7 gene • Pathogenic CHD7 variant	• CHARGE syndrome • CHARGE association • Coloboma	• Semicircular canal • Dysplasia of semi-circular canal

Using EMERSE to Search Records

Example screenshot from EMERSE



Benefits of Using EMERSE

For this study

True Financial Costs

- $31,360 for chart review without EMERSE.

Data Quality

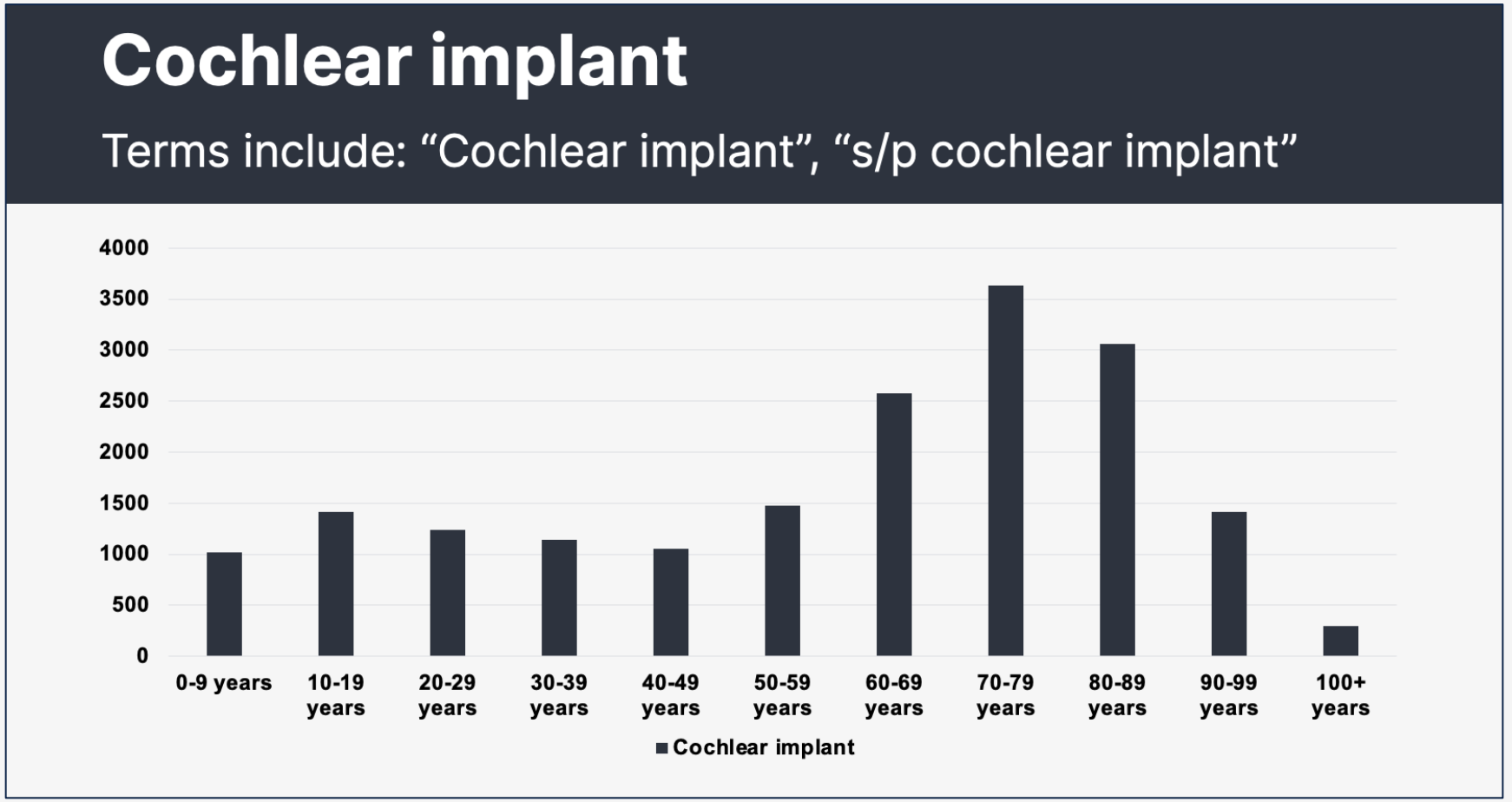
- Reduced variability.
- Easier to find data.
- Reproducible.

Project Management

- Fewer charts needed to be manually reviewed.
- Better for time restraints.

Other Uses of EMERSE

In our research group



Questions?

Thank you!

EMERSE version 7.2

- Testing (in production) underway at U of Michigan
- Preparing for wider release

- User interface framework updated – improved security
- Timeline
- Customizable table columns in Summaries
- OCR-ready (e.g., thumbnail views, highlighting within documents)
- Flowsheet-ready (search within flowsheets)
- More compact user interface
- Minor user interface updates (e.g., descriptions no longer required for Saved Patient Lists/Terms)

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EMERSE version 7.2

- Quick Demonstration

Work in progress

- User guide for version 7.2
- Solr Cloud
  - to scale up resources for improved performance
- Download data
  - Almost done, need to make a few more changes
- AI Integration
  - Short demonstration today

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Wrap-up

- Thanks for attending!
- Next Meeting: TBD (Fall 2026)
- Please complete meeting survey:
- https://bit.ly/emerse-may-2026