

EMERSE: an easy-to-use, researcher-approved tool for cohort identification and chart review with EHR notes

Presentation for the CTSA Program Webinar

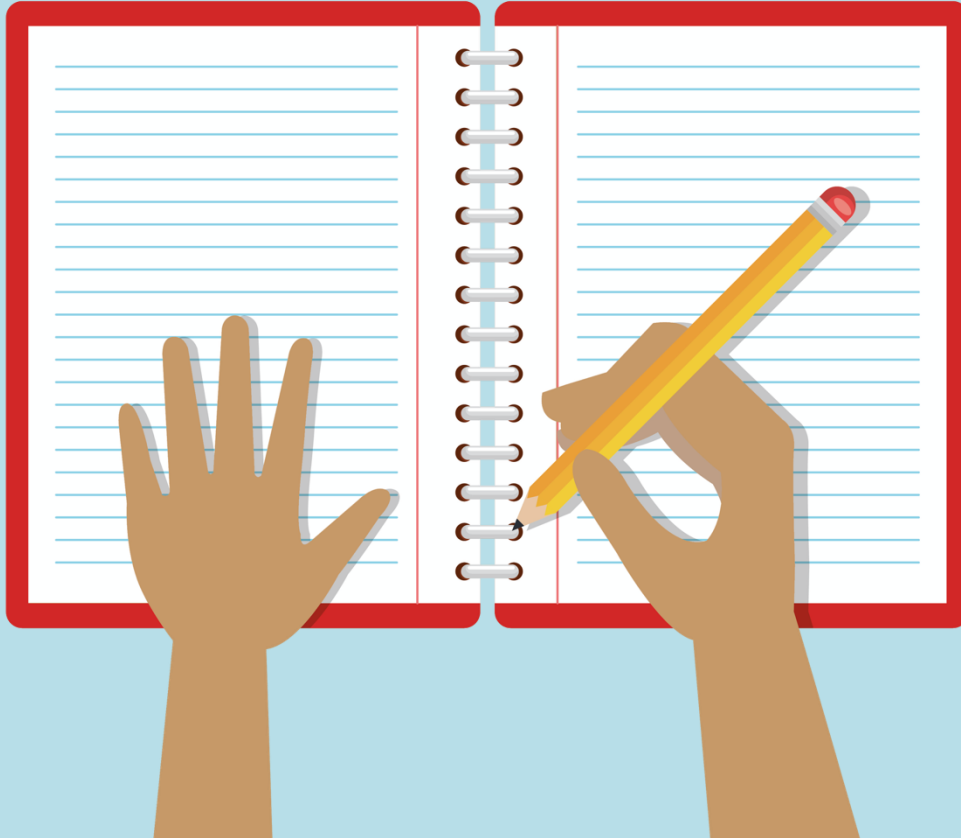
January 28, 2026



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Email: hanauer@umich.edu
emerse-team@umich.edu

David Hanauer, MD, MS
Dept of Learning Health Sciences
University of Michigan

If you want to take notes or visit links



these slides can be found at:

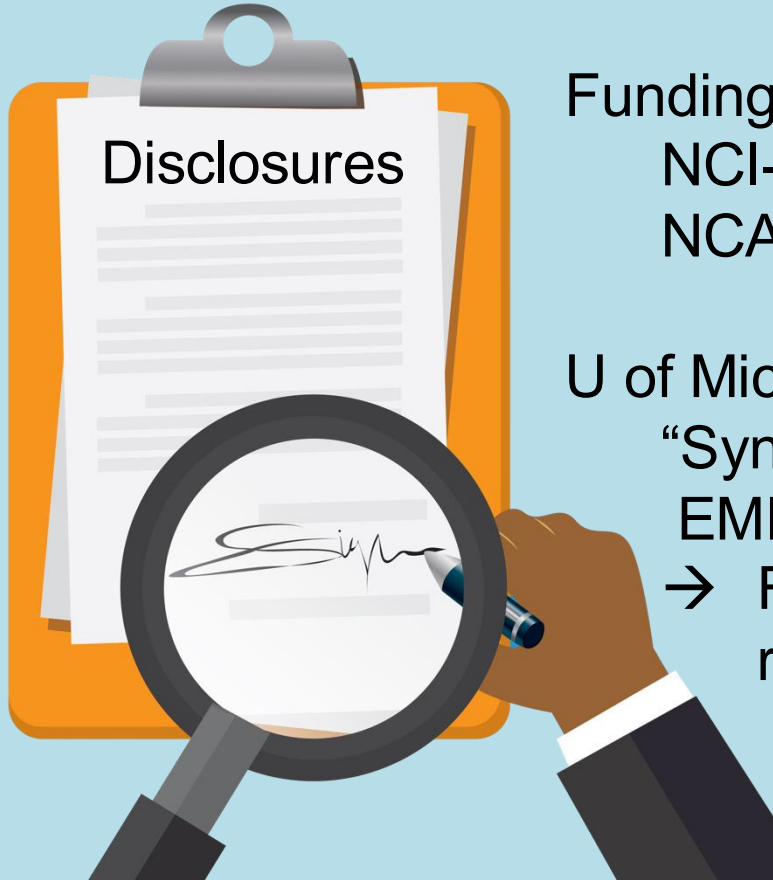
this link will be
on most slides



em**rse**
ELECTRONIC MEDICAL RECORD SEARCH ENGINE

<http://project-emerse.org/presentations.html>

Disclosures



Funding: NIH

NCI-ITCR: U24CA269315

NCATS-CTSA: UM1TR004404

U of Michigan Royalties/Licensing:

“Synonyms” dataset—optional “plugin” for
EMERSE

→ Free for use within EMERSE for
research

A hand holding a megaphone on a red background, with several orange and white triangular rays emanating from the speaker. A large white banner is positioned to the right of the megaphone.

I am here to tell you
about EMERSE

2021 study out of UC Irvine: *Design, Implementation, and Usability of the Electronic Medical Record Search Engine (EMERSE) Tool*

<https://escholarship.org/uc/item/44p23878>

“Users unanimously responded that they would recommend the system to others, and...for a tool they found so useful, they believed that **far too few people both within and outside of their network knew about the tool’s existence.**”



We want to close the researcher-leadership gap on software selection

We have a major need
for a tool like EMERSE

Our researchers don't
need a tool like this

This is exactly the tool
we have been looking for

We already have
something that does
the same thing.

We have nothing like it



Unstructured vs Structured Data

EMERSE is for this...	...not this
<i>Unstructured Data (free-text)</i>	<i>Structured Data</i>
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 severe headache on the left side.	WBC: 5.6 Total cholesterol: 182 Weight: 67.4 AST: 30 ALT: 52

80% of EHR data are in unstructured free-text



]

structured data

]

unstructured data/free text

Most medical centers lack tools for free-text



And many options that exist aren't great



2024 study on EMR usability:

“The same three items (integration into workflow, **finding information**, and usability of alerts) received the highest number of 'poor' ratings among hospital and practice physicians.”

<https://www.nature.com/articles/s41746-025-01657-4>

Do we even need search anymore?



Yes!

Perspective

Search still matters: information retrieval in the era of generative AI

William Hersh , MD*

<https://pmc.ncbi.nlm.nih.gov/articles/PMC11339511/pdf/ocae014.pdf>
2024

The EMERSE solution



- A system “for the people”
- Users search the notes on their own
 - No 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 > 20 years

The EMERSE solution

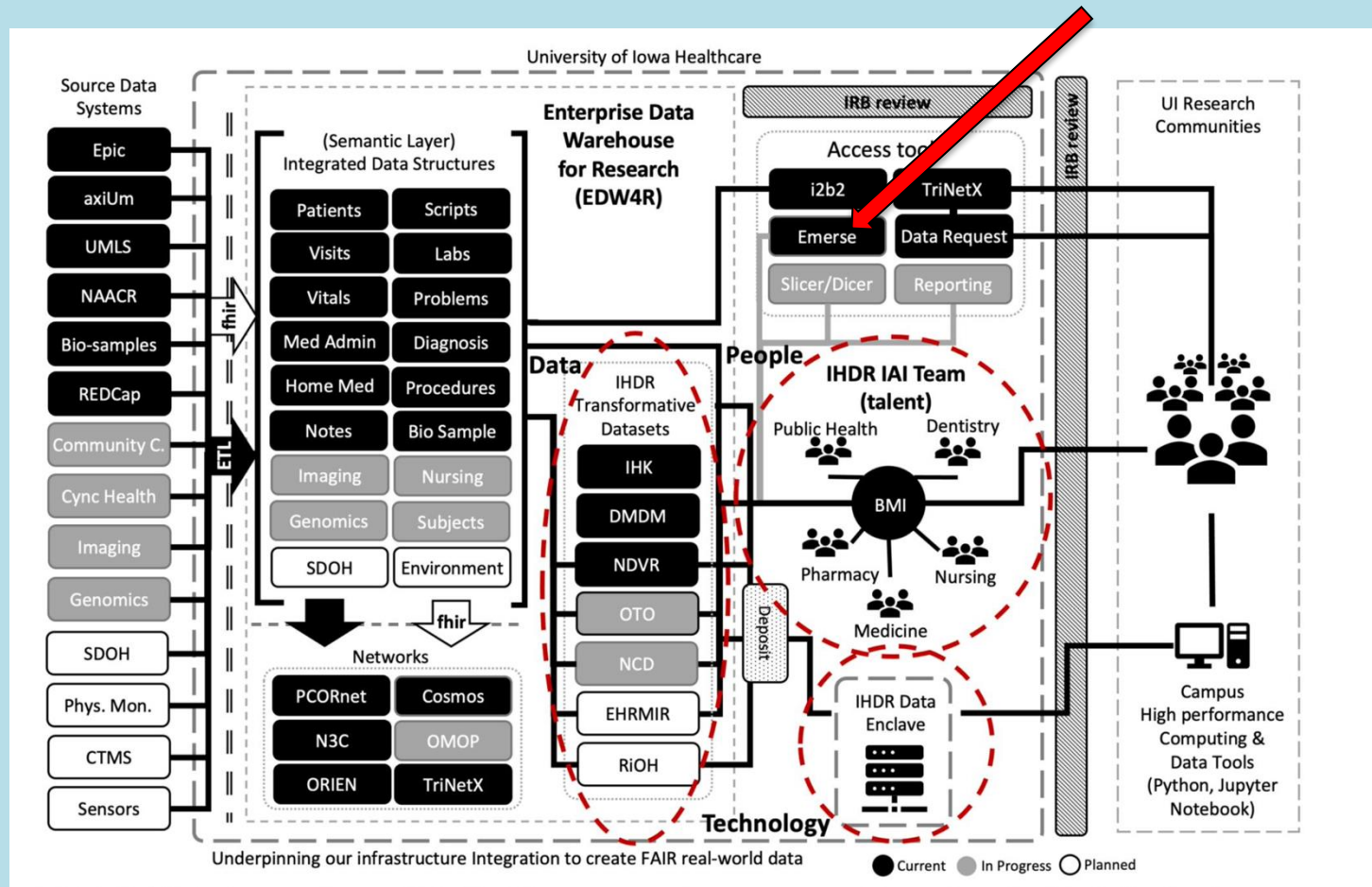


- A system “for the admins”
- Enterprise grade, easy to support
- Configurable with granular roles/privileges to control access (e.g, all patients vs. some patients)
- Data are kept secure within a centralized, audited system *at your own site*
 - No need to copy the data elsewhere

EMERSE is a super useful tool

- but it will likely be one of several you need to support your project(s)





We think EMERSE is **fff**-ing good



We think EMERSE is **fff**-ing good

- “**f**ast **f**ree-text **f**inding” good



We think EMERSE is **fff**-ing good

- “**f**ast **f**ree-text **f**inding” good
- it’s also **f**lexible, **f**ree, and **f**un



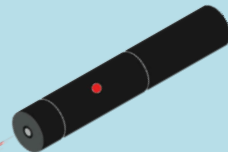
We think EMERSE is fff-ing good

- We're proud of what we've created
- We think it's better than other options



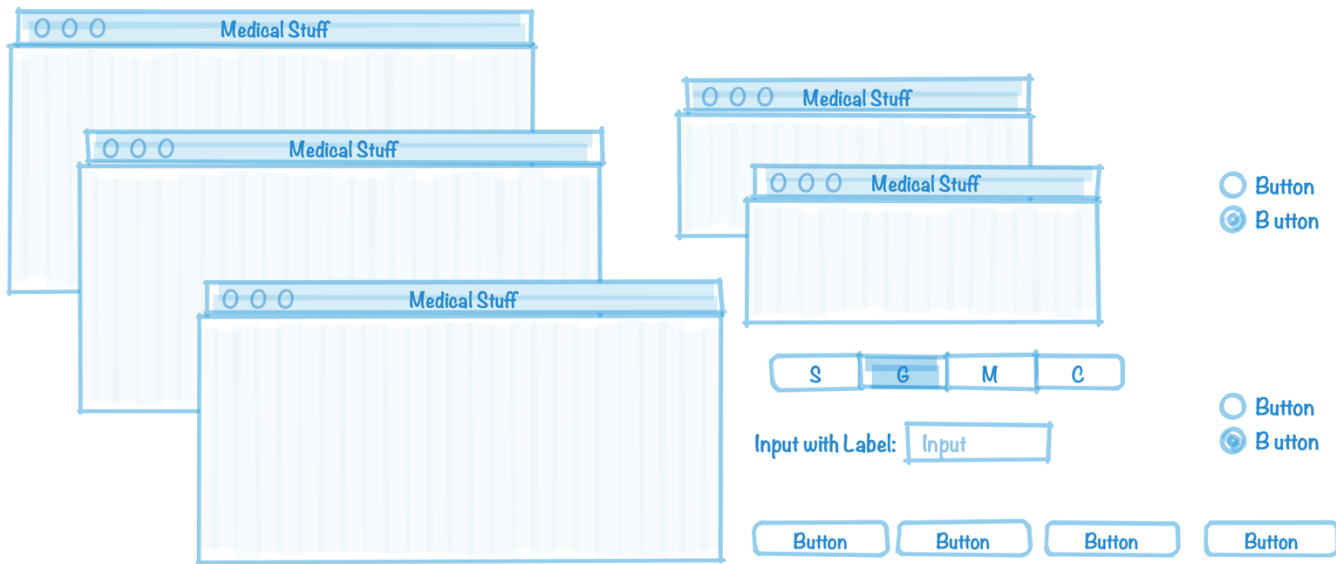
Why do we think it's better?

We've been laser-focused on it



EHRs have thousands of features

ACME EHR



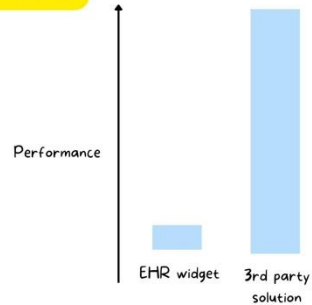
The EMERSE team has invested 20+ years on just this one feature (search) because it's so important

Why do we think it's better?

It has to be better

It's not a health system's fault for hoping an EHR can provide everything.

3rd party solutions must be 10x better on a differentiator that truly matters.



EMERSE is a “best of breed” product and must stay ahead of integrated EHR tools to remain relevant

Why do we think it's better?

We've studied it

- “**new users of the EMERSE system** are able to complete basic but critical workflow tasks in the system with a high rate of success...are **highly satisfied with the interface**, and have highly positive perceptions of its expected utility in their work.”
- “survey results indicate **very high ratings of usability and satisfaction** with the EMERSE system by new users after only one session of use.”

Why do we think it's better?

Our users tell us

Thank you for...this important tool which is **proving extremely valuable** in enhancing patient safety and quality of care delivered at Michigan Medicine.

..continued gratitude for the availability of this powerful research tool. As always, **thank you for this innovation!**

EMERSE is **working out great for casefinding**...have found quite a bit of cases that we would have missed otherwise. **Thank you and everyone on your team!**

To say “**it is the most useful tool I use in my job**” would be an understatement, so **thank you** for creating and sharing it with others!!

EMERSE is **an absolute gem** @umichmedicine. The functionality is very friendly and it saved hours of time during the data collection process. **Thank you to the team** that created this powerful research tool!



Why do we think it's better?

Researchers mention its strengths in their publications

- “Reviewers used the EMERSE search tool to **ensure thorough review** of the available documentation...” [PMID 36119396]
- “the **tool avoids the pitfalls of diagnostic inaccuracy** seen with tools querying on ICD and billing codes...” [PMID 36114099]
- “[EMERSE] provides software features to **comprehensively scan all clinical documents**...for keywords and phrases to ensure that even rarely mentioned events are detected.” [PMID 36550198]
- “...information [was] captured via EMERSE...in order to **obtain the most accurate and complete information** per patient.” [PMID 36752520]

Why do we think it's better?

Top-tier medical centers use it

Site	Site
U of Michigan	Case Western Reserve U
Harvard U – Dana Farber Cancer Center	Utrecht University, Netherlands
Columbia U Cancer Center	U of Iowa
U of North Carolina – Chapel Hill	Weill Cornell Medical Center
U of California – San Francisco	U of Virginia
U of Kentucky	Moffitt Cancer Center, Tampa, FL*
U of Cincinnati	Children's Health Orange County, Calif.*

*Currently installing

Why do we think it's better?

Real people use it

2025
stats



UNIVERSITY OF
MICHIGAN

- 682 users
- 412 IRB-approved studies


Learn more in our annual report:

<https://project-emerse.org/reports/EMERSE-annual-report-2025.pdf>



What can EMERSE do?

Lots of things!



EMERSE for Cardiac Surgery Research

David Hanauer

Linda Farhat, Clinical Research Coordinator
Department of Cardiac Surgery, Michigan Medicine

01:28

Cardiac Surgery Research

"It allows us to basically target exactly what we need to know."

--Linda Farhat, Clinical Research Coordinator



EMERSE for Quality Analytics

David Hanauer

Andrew Heiler, Clinical Quality Coordinator

01:18

Quality Analytics

"I can't imagine having to do what I do without having EMERSE."

--Andrew Heiler, Quality Analytics Coordinator



EMERSE for Infection Control

David Hanauer

Jayna Berger Heiler, Infection Prevention Coach

01:33

Infection Prevention

"The value of EMERSE is immeasurable."

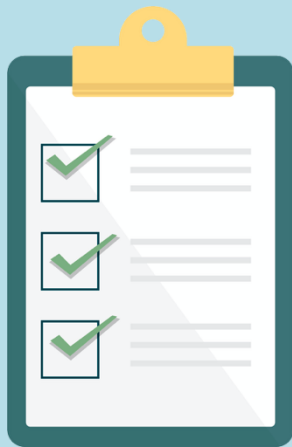
--Jayna Berger Heiler, Infection Prevention Coach

Watch our videos: https://project-emerse.org/use_cases.html

Find cohorts

EMERSE allows you to find cohorts based on things mentioned in the notes

- diseases
- drugs
- symptoms
- anything*



*if it is mentioned

Find cohorts

It's perfect for finding rare things...



...like rare cancers such as
cutaneous leiomyosarcoma

See this talk for more details:

<https://vimeo.com/677482835>

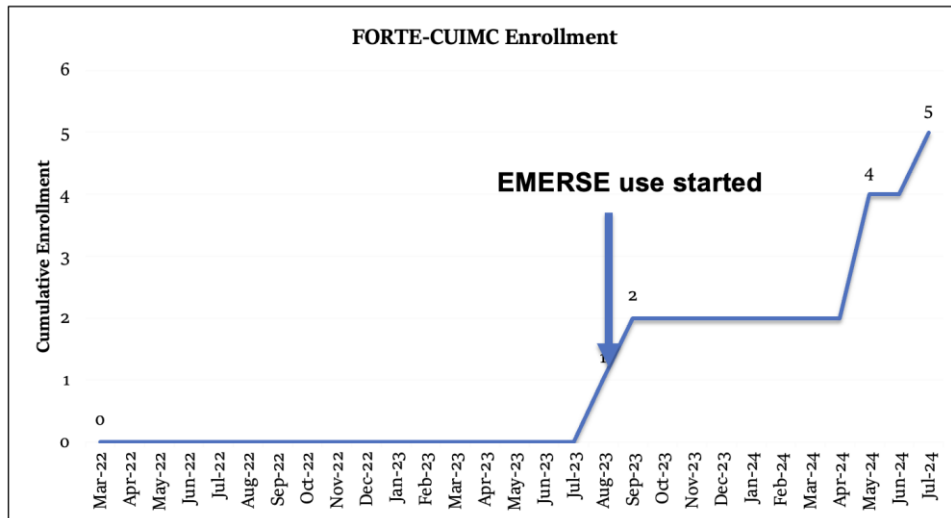
“Using EMERSE to Improve Research
Involving Rare Cancers”



Enroll patients on trials

- We were able to enroll patients!

- **Note:**
While CUMC rolled out the EMERSE workflow for FORTE, we were also simultaneously testing reaching out to EMERSE identified FORTE patients over MyChart to introduce the FORTE study to patients

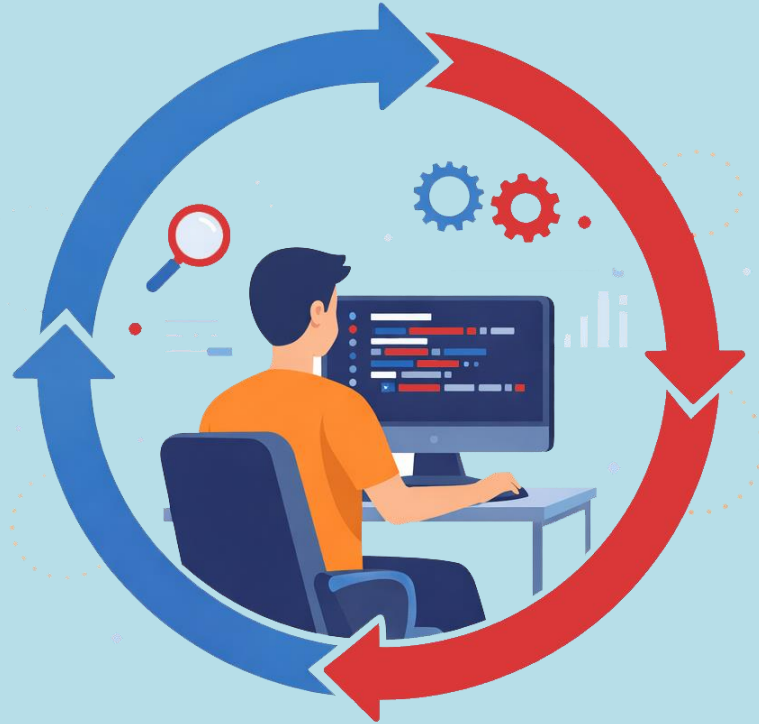


See this talk for more details:

<https://vimeo.com/1084845123/>

EMERSE Community Meeting May 2025

We keep the human-in-the-loop



Highlight documents for chart review

Thoracocentesis confirmed the recurrence of mantle cell lymphoma. Disease restaging work-up revealed multicompartiment lymphadenopathy in the neck, mediastinal, retrocrural, retroperitoneal and pelvic regions. Bone marrow was also involved. The patient was treated with a total of six cycles of rituximab, cyclophosphamide, vincristine, doxorubicin and dexamethasone (R-HyperCVAD) completed in January 2007. That treatment led to complete remission that lasted until October 2008, when the disease was found to have recurred in the left pleural space and retroperitoneum without bone marrow involvement.

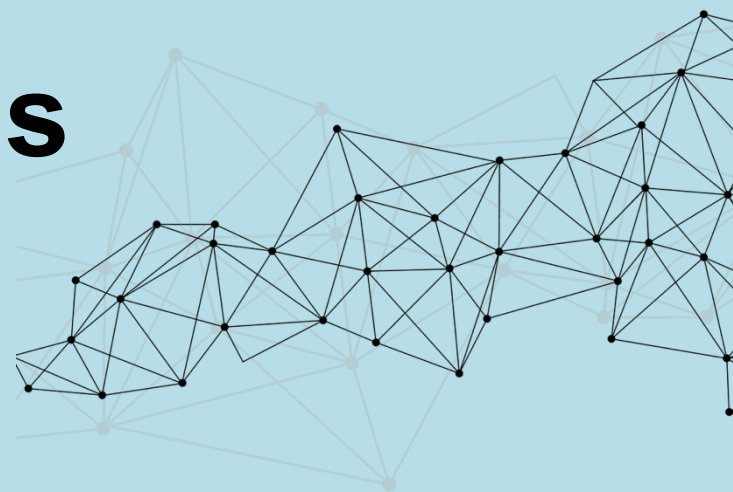


EMERSE is \equiv *fast*

Query to identify all patients with the following	Reporting DB time (s)	EMERSE time (s)	EMERSE advantage
cavernous hemangioma	14,652	2	7,320x
gray platelet syndrome	14,940	2	7,470x
inferior lingular segment of the left upper lobe	17,784	9	1,980x

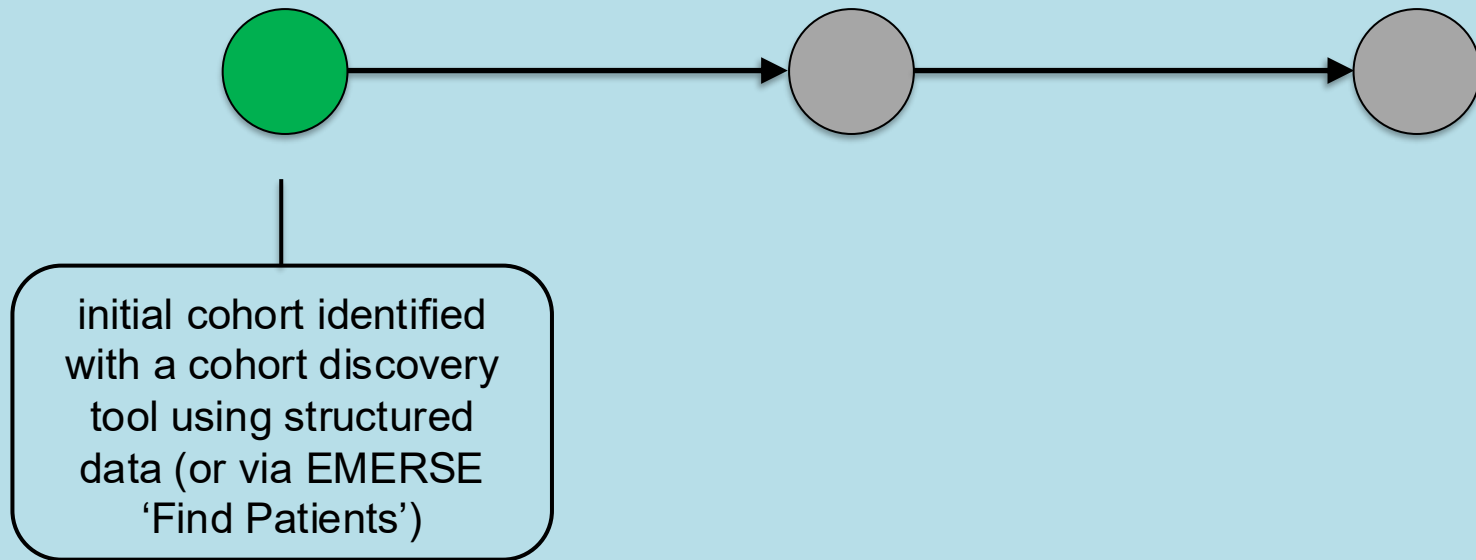
...enabling real-time querying

Synonyms



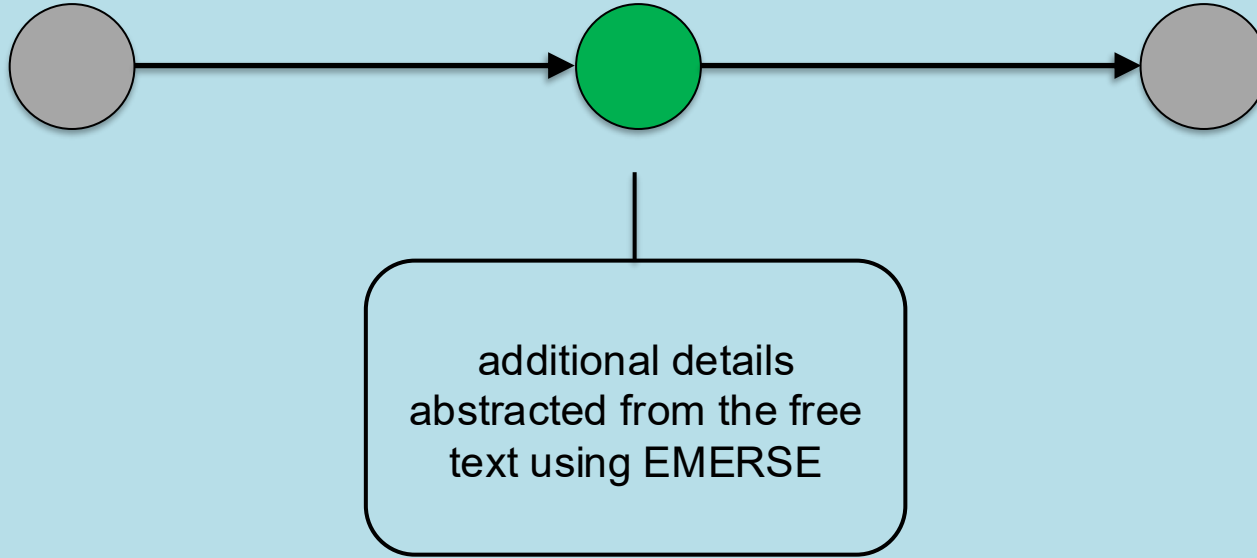
- Used for query expansions
- User-controlled
- Multiple datasets can be included
- EMERSE Synonyms
 - acronyms, abbreviations, professional/consumer terms, misspellings, trade/generic drug names, species, chemo regimens, phrase variations, malapropisms, idioms, neologisms, organizations, companies, & more
 - 3 million unique entries

Typical workflow

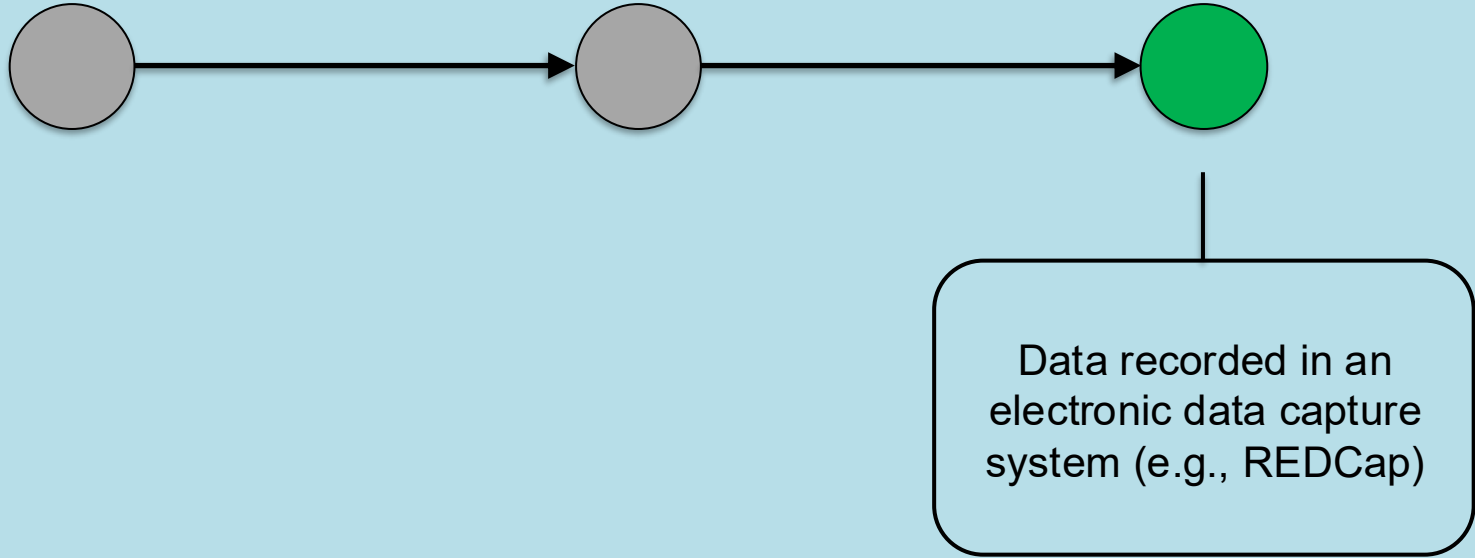


Cohort discovery tools:
i2b2/ENACT, Leaf, etc.

Typical workflow



Typical workflow



Publications using EMERSE

723

papers and abstracts



Full list at:

<http://project-emerse.org/publications.html>

Recently released...



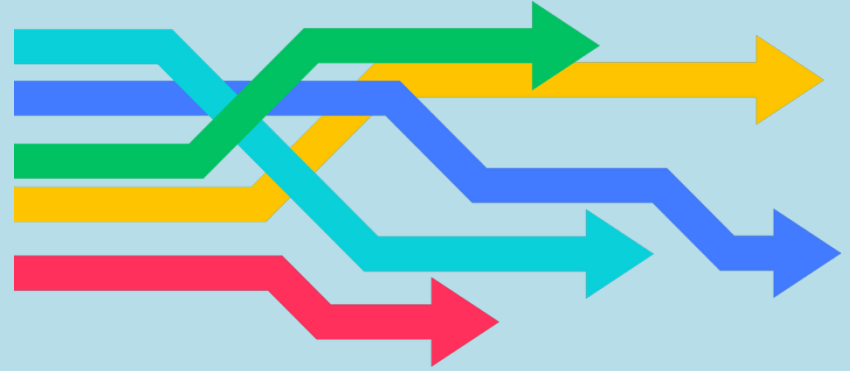
Incorporation of NLP features

- negation
- uncertainty
- subject (patient vs other)
- history of
- named entity recognition/mapping to ontologies

If you don't like our built-in NLP, use your own



Ongoing Work



- Automated data extraction from templated notes
- Optical Character Recognition of scanned documents
- Integration with ChatGPT or similar tools

ChatGPT/LLM integration



- Interactive chat about a patient's notes
- Human-in-the-loop with data verification

How much does it cost?

Software (w/ source code)	\$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



Fine Print

- There will be local operational costs
 - free kitten < free pony
- Sites need to determine how to extract their data to get it into EMERSE
 - We can provide recommendations
- Sites install EMERSE themselves
 - on premise or in the cloud
- Our team does not have access to anyone's data other than U of Michigan



Community Meetings



Twice per year – recordings available online

Last meeting November 2025

Next meeting May 2026

Demo



- No real names
- No PHI
- Publicly available
- Abstracts & case reports

FIND PATIENTS

Query Details

1

ADD

 Color



USE THE NEXT AVAILABLE COLOR

Term color will remain the same unless using the button above or by selecting a new color from the palette. Colors can be used to determine the search logic (AND/OR). Colors are disabled when terms are excluded from a search. Colors are disabled when terms are excluded from a search.

C Case-sensitive

TOGGLE CASE-SENSITIVE ON SELECTED TEXT


Individual words can be selected. Words in **bold** will be searched for in a case-sensitive manner.

N Negation

- ☐ Find positive mentions only (example: "she has diabetes")
- ☐ Find negated mentions only (example: "she denies diabetes")
- ☐ Find any mentions regardless of negation

SEARCH LOGIC: DEFAULT

22

 cutaneous leiomyosarcoma

SYNONYMS

Patients

All Local Patients (10,000)

Filters

Terms

cutaneous leiomyosarcoma

HIGHLIGHT DOCUMENTS

FIND PATIENTS

Results

Summaries

Diagnoses

Trends

3 patients matched the search criteria

To review these patients in more detail, move to a temporary patient list and then click the Highlight Documents button.

[MOVE TO TEMPORARY PATIENT LIST](#)

Annotations

Negation

Uncertainty

Non-patient subject

History of

Note: Sections that overlap will be underlined in black

Top 3 Matching Documents

Consent Form (Radiology)	07/24/2011
...year-old woman with a cutaneous leiomyosarcoma associated with osteoclast-like giant...	
...Conclusion A rare case of cutaneous leiomyosarcoma with osteoclast-like giant cells...	
...that our case represents a cutaneous leiomyosarcoma with reactive osteoclast-like giant...	
...osteoclast-like giant cells in cutaneous leiomyosarcoma is unknown...	
...Conclusion A rare case of cutaneous leiomyosarcoma with osteoclast-like giant cells...	
Discharge Summary (Other)	08/15/2015
...Primary cutaneous leiomyosarcoma (PCL) are soft-tissue sarcoma...	

Temporary List (3)

cutaneous leiomyosarcoma

HIGHLIGHT DOCUMENTS

[FIND PATIENTS](#)

Saved Patient Lists

All Local Patients

Network

Name/Description

Add Patients

[View Patients](#)

Patient Demographics

Share

Save

Clear

Export

MRN	Name	Birth Date	Age	Action
100000056	Hester, Arturo	11/23/1938	87 Years	Remove
100001598	Pope, Adelynn	02/25/1972	53 Years	Remove
100005510	Garner, Ryker	03/26/1965	60 Years	Remove

Patients per page 50 1 - 3 of 3 patients

Temporary List (3)

Terms

cutaneous leiomyosarcoma

HIGHLIGHT DOCUMENTS

FIND PATIENTS

Overview

Sorted by: Insert Order ▾ Ascending ▾

Numbers Grayscale Mosaic

MRN	Name	Main EHR	Radiology	Pathology	Other	Scanned/PDFs	Comment	Tag
100000056	Hester, Arturo		1 of 16				<div>0 / 255</div>	<input type="checkbox"/>
100001598	Pope, Adelynn				1 of 18		<div>0 / 255</div>	<input type="checkbox"/>
100005510	Garner, Ryker			1 of 17			<div>0 / 255</div>	<input type="checkbox"/>

Patients

Temporary List (3)

Filters

Terms

cutaneous leiomyosarcoma

Results

HIGHLIGHT DOCUMENTS

FIND PATIENTS

Main EHR

Radiology

1 of 16

Pathology

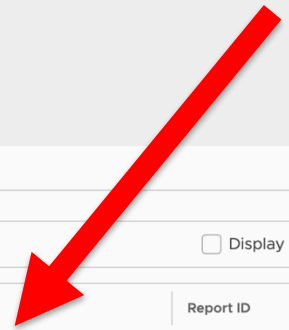
Other

Scanned/PDFs

> Name: Hester, Arturo, MRN: 100000056

☐ Display All Documents

Summary	Report ID	Encounter Date	Encounter ID	Imaging Modality	Imaged Body Part	Viewed
...year-old woman with a cutaneous leiomyosarcoma associated with osteoclast-like giant... ...Conclusion A rare case of cutaneous leiomyosarcoma with osteoclast-like giant cells... ...that our case represents a cutaneous leiomyosarcoma with reactive osteoclast-like giant... ...osteoclast-like giant cells in cutaneous leiomyosarcoma is unknown... ...Conclusion A rare case of cutaneous leiomyosarcoma with osteoclast-like giant cells...	docid_8_...	07/24/2011	4076924	MRI	Abdomen	N



Filters

Terms cutaneous leiomyosarcoma

Results

HIGHLIGHT DOCUMENTS

[FIND PATIENTS](#)

Overview Summaries Document

1 of 3 1 of 1
 < Patient > < Document >

Main EHR

Radiology

1 of 16

Pathology

Other

Scanned/PDFs

▼ Name: Hester, Arturo, MRN: 100000056

☐ Display All Documents

☐ Stick on Top

> Radiology Report

➤ Semantic Groups

> Annotations

> Summary

Case Report from the Journal of Medical Case Reports Title: Leiomyosarcoma of the skin with osteoclast-like giant cells: a case report | Journal of Medical Case Reports | Full Text DOI: 10.1186/1752-1947-1-180 Abstract Introduction Osteoclast-like giant cells have been noted in various malignant tumors, such as, carcinomas of pancreas and liver and leiomyosarcomas of non-cutaneous locations, such as, uterus and rectum. We were unable to find any reported case of a leiomyosarcoma of the skin where osteoclast-like giant cells were present in the tumor. Case presentation We report a case of a 59-year-old woman with a **cutaneous leiomyosarcoma** associated with osteoclast-like giant cells arising from the subcutaneous artery of the leg. The nature of the giant cells is discussed in light of the findings from the immunostaining as well as survey of the literature. Conclusion A rare case of **cutaneous leiomyosarcoma** with osteoclast-like giant cells is reported. The giant cells in the tumor appear to be reactive histiocytic cells. Open Peer Review reports Introduction Osteoclast-like giant cells have been noted in various malignant tumors, such as, carcinomas of pancreas and liver and leiomyosarcomas of non-cutaneous locations, such as, uterus and rectum. We were unable to find any reported case of leiomyosarcoma of the skin where osteoclast-like giant cells were present in the tumor. We are reporting such a case occurring in the leg of a 59-year-old woman and discussing the nature of the osteoclast-like giant cells in light of the results from the immunostaining as well as the survey of the literature. Case presentation A 59-year-old woman presented with a painless skin nodule on her left leg present for an unknown period of time. The patient's remaining medical history was unremarkable. An excisional biopsy of the leg nodule (Fig. 1) showed an infiltrating spindle cell neoplasm within the subcutaneous tissue, arising from the muscular wall of an artery. The tumor was composed of proliferating, interweaving fascicles of eosinophilic spindle cells with pleomorphic ovoid to cigar-shaped nuclei and occasional paranuclear vacuoles (Fig. 2a). The mitotic activity was brisk, ranging from 1 to more than 5 per 5 high-power fields. A striking finding in the tumor was the presence of scattered osteoclast-like giant cells with dark basophilic cytoplasm and multiple nuclei (Fig. 2b) in between the neoplastic spindle cells. The spindle cells were strongly

Demo List (16)

Filters

Terms

shingles herpest zoster VZV eruption acoustic symptoms ear pain prednisone acyclovir facial weakness

Results

[HIGHLIGHT DOCUMENTS](#) [FIND PATIENTS](#)

Temporary Patient List

Saved Patient Lists

All Local Patients

Network

Demo List

Name/Description

Add Patients

[View Patients](#)

Patient Demographics

Share

Clear/Delete

Copy

Export

MRN	Name	Birth Date	Age	Comment	Tag	Action
100006810	Dudley, Gabriel	07/10/1938	87 Years	<div>possibly eligible for study</div> <div>27 / 255</div>	<input checked="" type="checkbox"/>	Remove
100006606	Perry, Kiana	08/09/1995	30 Years	<div>question about this patient, discuss with study lead</div> <div>52 / 255</div>	<input type="checkbox"/>	Remove
100005304	Kimura, Luciano	04/17/1981	44 Years	<div></div> <div>0 / 255</div>	<input checked="" type="checkbox"/>	Remove
100004810	Estrada, Marjorie	12/02/1953	72 Years	<div></div> <div>0 / 255</div>	<input type="checkbox"/>	Remove
100000396	Spencer, Lilian	02/14/2015	10 Years	<div></div> <div>0 / 255</div>	<input checked="" type="checkbox"/>	Remove
100004510	Hall, Colleen	01/03/1990	36 Years	<div></div> <div>0 / 255</div>	<input type="checkbox"/>	Remove

Patients per page 50 1 - 16 of 16 patients

Patients per page 50 1 - 16 of 16 patients

Patients Demo List (16)

Filters

Terms

shingles herpest zoster VZV eruption acoustic symptoms ear pain prednisone acyclovir facial weakness

Results

[HIGHLIGHT DOCUMENTS](#) [FIND PATIENTS](#)

Overview

Sorted by: Insert Order ▾ Ascending ▾

Numbers Grayscale Mosaic

MRN	Name	Main EHR	Radiology	Pathology	Other	Scanned/PDFs	Comment	Tag
100006810	Dudley, Gabriel				1 of 17		possibly eligible for study 27 / 255	<input checked="" type="checkbox"/>
100006606	Perry, Kiana			1 of 20			question about this patient, discuss with study lead 52 / 255	<input type="checkbox"/>
100005304	Kimura, Luciano				1 of 16		 0 / 255	<input checked="" type="checkbox"/>
100004810	Estrada, Marjorie				1 of 17		 0 / 255	<input type="checkbox"/>
100000396	Spencer, Lilian							<input checked="" type="checkbox"/>

Patients per page 50 1 - 16 of 16 patients

^

shingles herpest zoster VZV eruption acoustic symptoms ear pain prednisone acyclovir facial weakness

[HIGHLIGHT DOCUMENTS](#) [FIND PATIENTS](#)

Numbers Grayscale Mosaic

Patients per page 50 1 - 16 of 16 patients

Filters

Terms

Results

Demo List (16)

shingles

herpest zoster

VZV eruption

acoustic symptoms

ear pain

prednisone

acyclovir

facial weakness

HIGHLIGHT DOCUMENTS

[FIND PATIENTS](#)

Overview

Summaries

2 of 16

< Patient >

Main EHR

Radiology

Pathology

1 of 20

Other

Scanned/PDFs

> Name: Perry, Kiana, MRN: 100006606

☐ Display All Documents

Summary	Report ID	Encounter Date	Encounter ID	Clinical Service	Provider	Document Type	Department	Viewer
<p>...He presented with right-sided facial weakness along with vesicular eruptions on...</p> <p>...of diseases including chickenpox and shingles can be induced by varicella...</p> <p>...few dermatomes (herpes zoster or shingles) [2, 3]. Subsequent to the...</p> <p>...without the concomitant facial and acoustic symptoms [6].</p> <p>Nonetheless, a few reports...</p> <p>...a patient with right-sided facial weakness along with vesicular eruptions on...</p> <p>...Iranian man developed severe right ear pain of three-week duration...</p> <p>...patient was treated with oral acyclovir. However, he was re-admitted...</p> <p>...for an abrupt onset of facial weakness and mild vertigo...</p> <p>...the patient had right-sided facial weakness (Figure 1...</p> <p>...crusts and scabs (characteristic of VZV eruption) were noted within the right...</p> <p>...patient was placed on oral prednisone and oral acyclovir...</p> <p>...gradual improvement in facial weakness was noted...</p> <p>...Note the peripheral facial weakness. Full size image Figure 2...</p> <p>...including chickenpox in childhood and shingles in elderly [1...</p> <p>...facial nerve, can cause peripheral facial weakness as well as rash around...</p> <p>...an elderly with right-sided facial weakness along with vesicular eruptions on...</p> <p>...C2-C3 dorsal root ganglia. Shingles is usually diagnosed by inspection...</p>	docid_8_...	12/27/2019	86787630	Gastroent...	Dawson, Sean	Consent Form	Dermatol...	Y

Filters

shingles herpest zoster VZV eruption acoustic symptoms ear pain prednisone acyclovir facial weakness

[HIGHLIGHT DOCUMENTS](#) [FIND PATIENTS](#)

2 of 16 1 of 1
 < Patient > < Document >

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1 of 20

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Filters

Terms

Results

Demo List (16)

shingles

HIGHLIGHT

herpest zoster

DOCUMENTS

VZV eruption

FIND PATIENTS

acoustic symptoms

1. *Journal of the American Medical Association*, 2000; 284: 2689-2695.

ear pain

prednisone

acyclovir

- facial weakness

2 of 16

1 of 1

< Patient > < Document >

Main EHR

Radiology

Pathology

1 of 20

Other

Scanned/PDFs

DOI: 10.4076/1752-1947-3-9134 Abstract Introduction Simultaneous involvements of multiple cranial nerve ganglia (geniculate ganglion and peripheral ganglia of cranial nerves VII, IX and X) by varicella-zoster virus and its subsequent activation may result in the characteristic eruptions of herpes zoster cephalicus. Coexistence of facial palsy and involvement of upper cervical dermatomes by varicella-zoster virus is quite rare. Case presentation Here, we report a 71-year-old Iranian man with involvement of multiple sensory ganglia (geniculate ganglion and upper dorsal root ganglia) by varicella-zoster virus. He presented with right-sided facial weakness along with vesicular eruptions on the right side of his neck, and second and third cervical dermatomes. Conclusion The present case is an example of herpes zoster cephalicus with cervical nerve involvement. Although resembling Ramsay Hunt syndrome with presence of facial nerve paralysis and accompanying vesicles, involvement of cervical dermatomes is not a feature of the classic Ramsay Hunt syndrome. Introduction A wide spectrum of diseases including chickenpox and shingles can be induced by varicella-zoster virus (VZV) [1]. After the primary infection (chickenpox), the virus remains dormant in cranial nerves (e.g. geniculate ganglion of facial nerve) and dorsal root ganglia and then becomes reactivated decades later [1, 2]. The reactivated VZV reaches the skin through axons usually causing pain and vesicular eruption restricted to a few dermatomes (herpes zoster or shingles) [2, 3]. Subsequent to the involvement of sensory branches of facial nerve by VZV, the contiguous motor branches might become inflamed, resulting in facial palsy [4]. First noted by Ramsay Hunt in early nineteenth, simultaneous involvements of multiple cranial nerve ganglia (geniculate ganglion and peripheral ganglia of cranial nerves VIII, IX and X) by VZV and its subsequent activation may result in the characteristic eruptions of herpes zoster cephalicus [5, 6]. Later in 1915, Sharpe classified herpes zoster cephalicus into five categories based on the inflammation of the geniculate, auditory, glossopharyngeal or vagal ganglia with or without the concomitant facial and acoustic symptoms [6]. Nonetheless, a few reports of the coexistence of facial palsy and involvement of upper cervical dermatomes by VZV can be read in the literature. Hereby, we report a patient with right-sided facial weakness along with vesicular eruptions on the right side of his neck and C2-C3 cervical dermatomes, indicating the involvement of multiple sensory ganglia (geniculate ganglion and upper dorsal root ganglia) by VZV. Case presentation A 71-year-old Iranian man developed severe right ear pain of three-week duration. He then developed a painful, vesicular eruption on the right side of his neck. With a presumptive diagnosis of herpes zoster reactivation, the patient was treated with oral acyclovir. However, he was re-admitted for an abrupt onset of facial weakness and mild vertigo. On examination, the patient had right-sided facial weakness (Figure 1). In addition, vesicular eruptions with adherent crusts and scabs (characteristic of VZV eruption) were noted within the right external auditory canal, over the mastoid, around the pinna, and C2-C3 cervical dermatomes (involvement of VII cranial nerve and C2-3 spinal nerves) (Figure 2). He had no associated immunocompromising condition including immunosuppressant drug use, leukemia, etc. A diagnosis of VZV reactivation from multiple ganglia was made based on the patient's characteristic presentation. The serum anti-VZV IgM antibody (ELISA) and VZV DNA (polymerase chain reaction) were negative. A computed tomography scan of the head was unremarkable. Further investigation revealed an increased white cell count (of 21600/7L) and a first hour erythrocyte sedimentation rate of 72 mm. The patient was placed on oral prednisone and oral acyclovir. A gradual improvement in facial weakness was noted. The herpetic

Filters

shingles herpest zoster VZV eruption acoustic symptoms ear pain prednisone acyclovir facial weakness

[HIGHLIGHT DOCUMENTS](#) [FIND PATIENTS](#)

2 of 16 1 of 1
Patient > < Document >

1 of 20

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Introduction A wide spectrum of diseases including chickenpox and shingles can be induced by varicella-zoster virus (VZV) [1]. After the primary infection (chickenpox), the virus remains dormant in cranial nerves (e.g. geniculate ganglion of facial nerve) and dorsal root ganglia and then becomes reactivated decades later [1, 2]. The reactivated VZV reaches the skin through axons usually causing pain and vesicular eruption restricted to a few dermatomes (herpes zoster or shingles) [2, 3]. Subsequent to the involvement of sensory branches of facial nerve by VZV, the contiguous motor branches might become inflamed, resulting in facial palsy [4]. First noted by Ramsay Hunt in early nineteenth century, simultaneous involvements of multiple cranial nerve ganglia (geniculate ganglion and peripheral ganglia of cranial nerves VIII, IX and X) by VZV and its subsequent activation may result in the characteristic eruptions of herpes zoster cephalicus. Classification of herpes zoster cephalicus has been classified herpes zoster cephalicus into five categories based on the site of involvement: isolated facial, isolated acoustic, isolated trigeminal, isolated vagal and mixed. Hereby, we report a patient with right-sided facial weakness along with involvement of multiple sensory ganglia (geniculate ganglion and upper dorsal root ganglia) by VZV. Case presentation A 71-year-old Iranian man developed a painful, vesicular eruption on the right side of his neck, and second and third cervical dermatomes over a one-week duration. He then developed a painful, vesicular eruption on the right side of his face involving the first three divisions of the trigeminal nerve with oral acyclovir. However, he was re-admitted for an abrupt onset of facial weakness and mild vertigo. On examination, the patient had right-sided facial weakness and mild vertigo. On examination, the patient had right-sided facial weakness and mild vertigo.

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Patients Demo List (16)

Filters

Terms shingles herpest zoster VZV eruption acoustic symptoms ear pain prednisone acyclovir facial weakness

Results HIGHLIGHT DOCUMENTS FIND PATIENTS

Overview Summaries Document

Main EHR



Radiology



Pathology

1 of 20

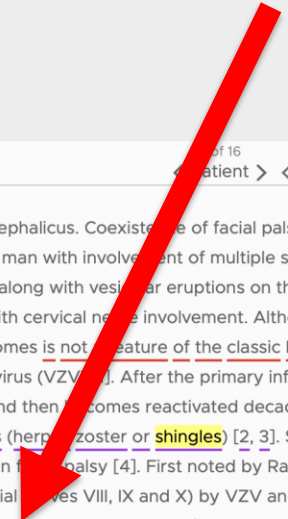
Other



Scanned/PDFs



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Filters

shingles herpest zoster VZV eruption acoustic symptoms ear pain prednisone acyclovir facial weakness

[HIGHLIGHT DOCUMENTS](#) [FIND PATIENTS](#)

[Temporary Terms](#)
[Saved Terms](#)
[Advanced Terms](#)
[Synonym Preferences](#)

Temporary Terms

Name/Description

Edit

Share

Save

Clear/Delete

Export

Bulk Upload

Query Details

acoustic symptoms

DONE

REMOVE

 Color



USE THE NEXT AVAILABLE COLOR

Term color will remain the same unless using the button above or by selecting a new color from the palette. Colors can be used to determine the search logic (AND/OR). Colors are disabled when terms are excluded from a search. Colors are disabled when terms are excluded from a search.

C Case-sensitive

TOGGLE CASE-SENSITIVE ON SELECTED TEXT

Individual words can be selected. Words in bold will be searched for in a case-sensitive manner.

N Negation

- ☒ Find positive mentions only (example: "she has diabetes")
- ☐ Find negated mentions only (example: "she denies diabetes")
- ☐ Find any mentions regardless of negation

Ⓢ Non-patient subject

- ☐ Find patient related mentions only (example: "she has diabetes")

Patients Demo List (16)

Filters

Terms shingles herpest zoster VZV eruption acoustic symptoms ear pain prednisone acyclovir facial weakness

Results HIGHLIGHT DOCUMENTS FIND PATIENTS

Overview Summaries Document

Main EHR

Radiology

Pathology 1 of 20

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Patients Demo List (16)

Filters

Terms

smoker

Results

HIGHLIGHT DOCUMENTS

FIND PATIENTS

Temporary Terms

Saved Terms

Advanced Terms

Synonym Preferences

Temporary Terms

Name/Description

Edit

Share

Save

Clear/Delete

Export

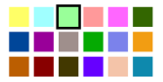
Bulk Upload

Query Details

Enter Terms/Phrases (one at a time)

ADD

Color



USE THE NEXT AVAILABLE COLOR

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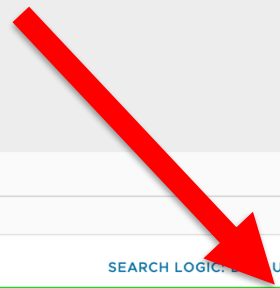
Active Terms/Phrases

SEARCH LOGIC RESULT

smoker

SYNONYMS

C N S U H P F E X W



Patients Demo List (16)

Filters

Terms **smoker**

Results **HIGHLIGHT DOCUMENTS**

Temporary Terms Saved Terms Advanced

Temporary Terms

Name/Description

Edit

Share

Save

Clear/Delete

Export

Bulk Upload

Query Details

Synonyms for smoker

Click individual terms to highlight or de-highlight.

WRAPAROUND VIEW

Synonyms (144)

SORT A TO Z

HIGHLIGHT ALL

HIGHLIGHT NONE

- abuse nicotine
- abuses nicotine
- addicted to nicotine
- addicted to tobacco
- addiction to nicotine
- addition to tobacco
- ash-tray
- ash-trays
- ashtray
- ashtrays
- behavior, smoking
- behaviors, smoking
- behaviour, smoking
- behaviours, smoking
- chain-smoker
- chain-smokers
- chain-smoking
- chainsmoker
- chainsmokers
- chainsmoking
- cigar
- cigar/day
- cigar per day
- cigarette
- cigarette/day
- cigarette pack/ day
- cigarette packs each day
- cigarette packs every day
- cigarette packs per day
- cigarette per day
- cigarette smoke
- cigarette smoker
- cigarette smokers
- cigarette smoking
- cigarettes
- cigarettes/day
- cigarettes per day
- cigars
- cigars/days
- cigars per day
- continue to smoke
- continued to smoke
- continues to smoke
- continuing to smoke
- current every day smoker
- current everyday smoker
- current smoker
- currently smokes
- dependence on cigarettes
- dependence on nicotine
- dependence on tobacco
- dependent on cigarettes
- dependent on nicotine
- dependent on tobacco
- habit, smoking
- habits, smoking
- light smoker
- nicotine
- nicotine abuse
- nicotine abuser
- nicotine abusers
- nicotine addiction
- nicotine additions
- nicotine dependence
- nicotine dependent
- pack a day
- pack/day
- pack each day
- pack history
- pack per day
- pack-year
- pack-year smoker
- pack-years
- pack yr
- pack yrs
- packs
- packs a day
- packs/day
- packs each day
- packs of cigarette/day
- packs of cigarette each day
- packs of cigarette per day
- packs of cigarettes/day
- packs of cigarettes each day
- packs of cigarettes every day
- packs of cigarettes per day
- packs per day
- packs per year
- packyear
- packyears
- packyr
- packyrs
- pipe

ADD HIGHLIGHTED TERMS (387) CANCEL

Patients Demo List (16)

Filters

Terms **cisplatin** **smoker**

Results **HIGHLIGHT DOCUMENTS**

Temporary Terms Saved Terms Advanced

Temporary Terms

Name/Description

Edit

Share

Save

Clear/Delete

Export

Bulk Upload

Query Details

Synonyms for cisplatin

Click individual terms to highlight or de-highlight.

WRAPAROUND VIEW

Synonyms (127)

SORT A TO Z

HIGHLIGHT ALL

HIGHLIGHT NONE

- Abiplatin AKOS025117566 analogue-of-cisplatin BDBM92386 BEP Blastolem Briplatin CACP
- chemotherapy cis cis-DDP Cis-diammine-dichloroplatinum cis-diamminedichloridoplatinum(II)
- cis-diamminedichloro-platinum(II) cis-Diamminedichloroplatinum cis-diammineplatinum(II)-dichloride
- Cis-dichloroamine-Platinum(II) cis-Dichlorodiammineplatinum(II) cis-Platin cis-platin cis-platinum II
- cis-platinum II diamine-dichloride cis-platinum(II)-diammine-dichloride cis-(PtCl2(NH3)2) Cismaplat cisp
- Cisplat Cisplatin,1 cisplatin-analogue cisplatin-analogues cisplatin-(cis) cisplatin-(cisp) Cisplatina
- eisplatinated Cisplatine Cisplatino Cisplatinum Cisplatyl Citoplatino Citosin CPDD Cysplatyna
- DB00515 DCEP DCF dd-MVAC ddMVAC DDP DHAP diamminedichloroplatinum DICE
- dose-dense-MVAC DT-PACE DTPACE ECX EDAP epirubicin, cisplatin-and-capecitabine
- epirubicin, cisplatin, capecitabine Epitope-ID:194799 Epitope-ID:194800 ESHAP EU-0100918 GAX-P
- GAX-P-chemotherapy GAX-P-regimen GDP Gem/Cis Gem/Cisplat GemCis GemCisplat
- gemcitabine, abraxane, capecitabine, and-cisplatin gemcitabine, abraxane, capecitabine, cisplatin
- gemcitabine, abraxane, xeloda, and-cisplatin gemcitabine, abraxane, xeloda, cisplatin ICE Lederplatin
- Metaplatin modified-DCF MVAC Neoplatin neoplatin PDD Pem/Cis pemetrexed/cisplatin
- Peyrone's-Chloride Peyrone's-chloride Peyrone's-Salt Peyrone's-salt Placis Plastistil platamin Platamine
- Platiblastin Platiblastin-S Platinex Platinol Platinol-AQ Platinol-AQ-VHA-Plus Platinexan

ADD HIGHLIGHTED TERMS (22) CANCEL

E

Assistant

Hello! I can help you understand details about this patient. Feel free to ask me questions about the patient's condition, medications, treatment plan or other information. Make sure you choose the conversation context to help me focus on the right documents. Always remember that as an AI tool I do not always provide perfect answers. Some responses could be incomplete, misinterpreted, or inaccurate. If my answers start to degrade over time, consider pressing the Clear Conversation button to help me focus on the right things.

You

You

what is the patient's alcohol intake

User enters



E

Assistant

Are you looking for the patient's current alcohol intake, lifetime history, or changes over a certain timeframe? Would you like me to search for documented screenings, clinician notes, or both?

AI clarifies



Model: gpt-4.1-2025-04-14 Context Usage: 0.13% [Query Details](#)

You

You

lifetime history, and all mentions

User enters



You

You

lifetime history, and all mentions

E

Assistant

The patient's lifetime history contains multiple mentions of alcohol intake in structured questionnaires and clinical notes. In 2020, several questionnaires consistently reported weekly alcohol use: 5 glasses of wine, 5 cans of beer, and 10 shots of liquor per week. In 2022, a clinical note indicated the patient reported drinking 4–6 cans of alcohol weekly. No evidence of alcohol abuse or dependence is documented. There are some additional questionnaire responses referencing alcohol intake or abstinence, but they are not contradictory to these findings.

Details from Clinical Documentation:

In July 2020, the patient self-reported drinking 5 glasses of wine, 5 cans of beer, and 10 shots of liquor per week.

- "Social History: Question: Alcohol Use Response: Yes Drinks/Week: 5 Glasses of wine, 5 Cans of beer, 10 Shots of liquor, 0 Drinks containing 0.5 oz of alcohol"

Source:
MiChart

CSN:
277969400

Date: 2020-07-
22

Document ID:
PORTAL_MSG_49089730

- "Social History: Question: Alcohol Use Response: Yes How many drinks/week?: 5 Glasses of wine, 5 Cans of beer, 10 Shots of liquor, 0 Standard drinks or equivalent"

Source:
MiChart

CSN:
278027550

Date: 2020-07-
23

Document ID:
PORTAL_MSG_49139997



Conversation context on:

All Documents For This Patient

Name: Cdr, Testseven, MRN: 60000475

CLEAR CONVERSATION

Document ID: PORTAL_MSG_49140169

Source: MiChart CSN: 277969400 Date: 2020-07-22 Document ID: PORTAL_MSG_49089730

- "Social History: Question: Alcohol Use Response: Yes How many drinks/week?: 5 Glasses of wine, 5 Cans of beer, 10 Shots of liquor, 0 Standard drinks or equivalent"

Source: MiChart CSN: 278027550 Date: 2020-07-23 Document ID: PORTAL_MSG_49139997

- "Social History: Question: Alcohol Use Response: Yes How many drinks/week?: 5 Glasses of wine, 5 Cans of beer, 10 Shots of liquor, 0 Standard drinks or equivalent"

Source: MiChart CSN: 278027642 Date: 2020-07-23 Document ID: PORTAL_MSG_49140169

- "Alcohol Use: Question: Alcohol Use Response: Yes How many drinks/week?: 5 Glasses of wine, 5 Cans of beer, 10 Shots of liquor, 0 Standard drinks or equivalent"

Source: MiChart CSN: 278204785 Date: 2020-07-27 Document ID: PORTAL_MSG_49254617

In March 2022, the patient reported drinking 4–6 cans of alcohol per week.

- "PATIENT SUBSTANCE USE Tobacco/Nicotine Use: No Alcohol Use: Yes Reports drinking 4-6 cans per week"

Source: MiChart CSN: 312095768 Date: 2022-03-11 Document ID: 126317304

No evidence of alcohol abuse, dependence, or substance use treatment found in the record.

- "Other Substance Use: No Treatment for Substance Use: No"

Response: No Response
Date: Comments:

Family History:

Problem: Anesth problems

Relation: Paternal Grandfather

Name: Grandpa

Comments:

Social History:

Question: Alcohol Use

Response: Yes

How many drinks/week?: 5 Glasses of wine, 5 Cans of beer, 10 Shots of liquor, 0 Standard drinks or equivalent

Comments:

Question:

Response: Yes

Partners: Male

Birth Control / Protection: Condom, None

Comments:

You

You

what antihypertensives has this patient been on?

E

Assistant

This patient has a history of antihypertensive medication use, specifically lisinopril, as documented in both the structured medication records and the narrative clinical notes. Lisinopril is an ACE inhibitor commonly used for hypertension. There are also structured entries documenting use of diuretics such as furosemide, which may be used for blood pressure management, though it is not exclusively an antihypertensive. There is no evidence in the available records of the patient being prescribed other major classes of antihypertensive agents such as beta-blockers, calcium channel blockers, or ARBs.

Details from Clinical Documentation:

The patient has been prescribed lisinopril (ACE inhibitor) for hypertension.

- "lisinopril (ZESTRIL) 5 mg tablet Sig - Route: Take 5 mg by mouth once daily. - Oral
Class: Historical Med"

Source: MiChart CSN: 264715103 Date: 2019-10-15 Document ID: 86892278

- "lisinopril (ZESTRIL) 5 mg tablet Sig - Route: Take 5 mg by mouth once daily. - Oral
Class: Historical Med"

Source: MiChart CSN: 266627664 Date: 2019-11-20 Document ID: 88066110

Conversation context on:

All Documents For This Patient

Ask a question about this patient...

Send

enoxaparin (LOVENOX) 150 mg/mL 10 syringe 0 5/14/2018
injection syringe

Sig - Route: Inject 1 mL (150 mg) into the skin once daily. - Subcutaneous
Cosign for Ordering: Required by UM HIM ADMINISTRATOR

flecainide (TAMBOCOR) 150 mg 120 tablet PRN 4/10/2019
tablet

Sig - Route: Take 2 tablets (300 mg) by mouth two times daily. One dose = 2 tabs - Oral
Cosign for Ordering: Required by UM HIM ADMINISTRATOR

FLUoxetine 10 mg tablet 30 tablet 1 7/3/2019
Sig - Route: Take 1 tablet (10 mg) by mouth once daily. - Oral

FREE-TEXT MEDICATION 1 each 0 8/15/2017

Sig: aaa
Class: Print

FUROSEMIDE INJ

Class: Historical Med

heparin 10 unit/mL syringe 5 mL 90 syringe PRN 7/29/2016
(HomeInf)

Sig - Route: Flush each lumen of intravenous catheter with 5 mL as directed. - Intra-Catheter
Notes to Pharmacy: Pharmacy to determine frequency based on protocol and/or medication administration schedule.

Cosign for Ordering: Required by UM HIM ADMINISTRATOR

HYDROcodone-acetaminophen (V- 166 tablet 0 9/8/2017
CODIN) 5-300 mg tablet

Sig - Route: Take 1 tablet by mouth four to six hours as needed for pain. - Oral
Earliest Fill Date: 9/8/2017

lisinopril (ZESTRIL) 5 mg tablet
Sig - Route: Take 5 mg by mouth once daily. - Oral
Class: Historical Med

methotrexate 2.5 mg tablet 90 tablet 3 7/9/2019 7/8/2020
Sig - Route: Take 6 tablets (15 mg) by mouth once a week. - Oral

metronIDAZOLE (FLAGYL) 250 mg 30 tablet 0 4/9/2018
tablet

Sig - Route: Take 1 tablet (250 mg) by mouth three times daily. - Oral
Cosign for Ordering: Required by UM HIM ADMINISTRATOR

sertraline (ZOLOFT) 50 mg tablet 90 tablet 4 5/30/2018 8/23/2019
Sig - Route: Take 1 tablet (50 mg) by mouth once daily. - Oral

sodium chloride 0.9 % syringe 10 mL 10 syringe PRN 7/29/2016
(HomeInf)

Sig - Route: Flush IV catheter with 10 mL after blood draws as directed. - Intra-Catheter
Notes to Pharmacy: Pharmacy to determine frequency based on protocol and/or medication administration schedule.

Cosign for Ordering: Required by UM HIM ADMINISTRATOR

sodium chloride 0.9 % syringe 5 mL 90 syringe PRN 7/29/2016
(HomeInf)

Sig - Route: Flush each lumen of intravenous catheter with 5 mL as directed. - Intra-Catheter
Notes to Pharmacy: Pharmacy to determine frequency based on protocol and/or medication administration schedule.

Cosign for Ordering: Required by UM HIM ADMINISTRATOR

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- Implementation planning
- Discussions about usage strategies
- Training
- Live demonstrations (abstractors, IT teams, etc)



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Lisa Ferguson
David Hanauer
Kellen McClain
Guan Wang

**THANK
YOU!**

