INFORMATICS PROFESSIONALS. LEADING THE WAY.

EMERSE: electronic medical record search engine

Panel – The National Cancer Institute's Informatics Technology for Cancer Research Program: Building A Community of Practice in Cancer Informatics

S34

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University of Michigan

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#AMIA2019

emerse

ELECTRONIC MEDICAL RECORD SEARCH ENGINE

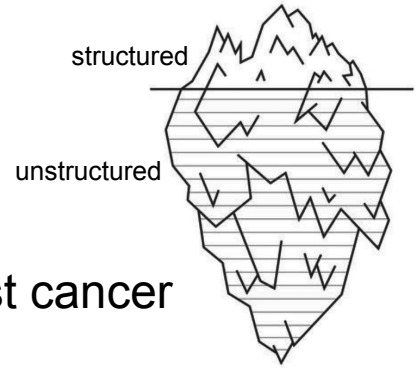
Disclosure

I and my spouse/partner have no relevant relationships with commercial interests to disclose.

What is EMERSE?

Self-service search tool for the medical record free text notes

→ the 80% not captured in structured data



Helps people abstract the phenotype, for non-coded data

→ e.g., metastatic ductal vs. metastatic lobular breast cancer

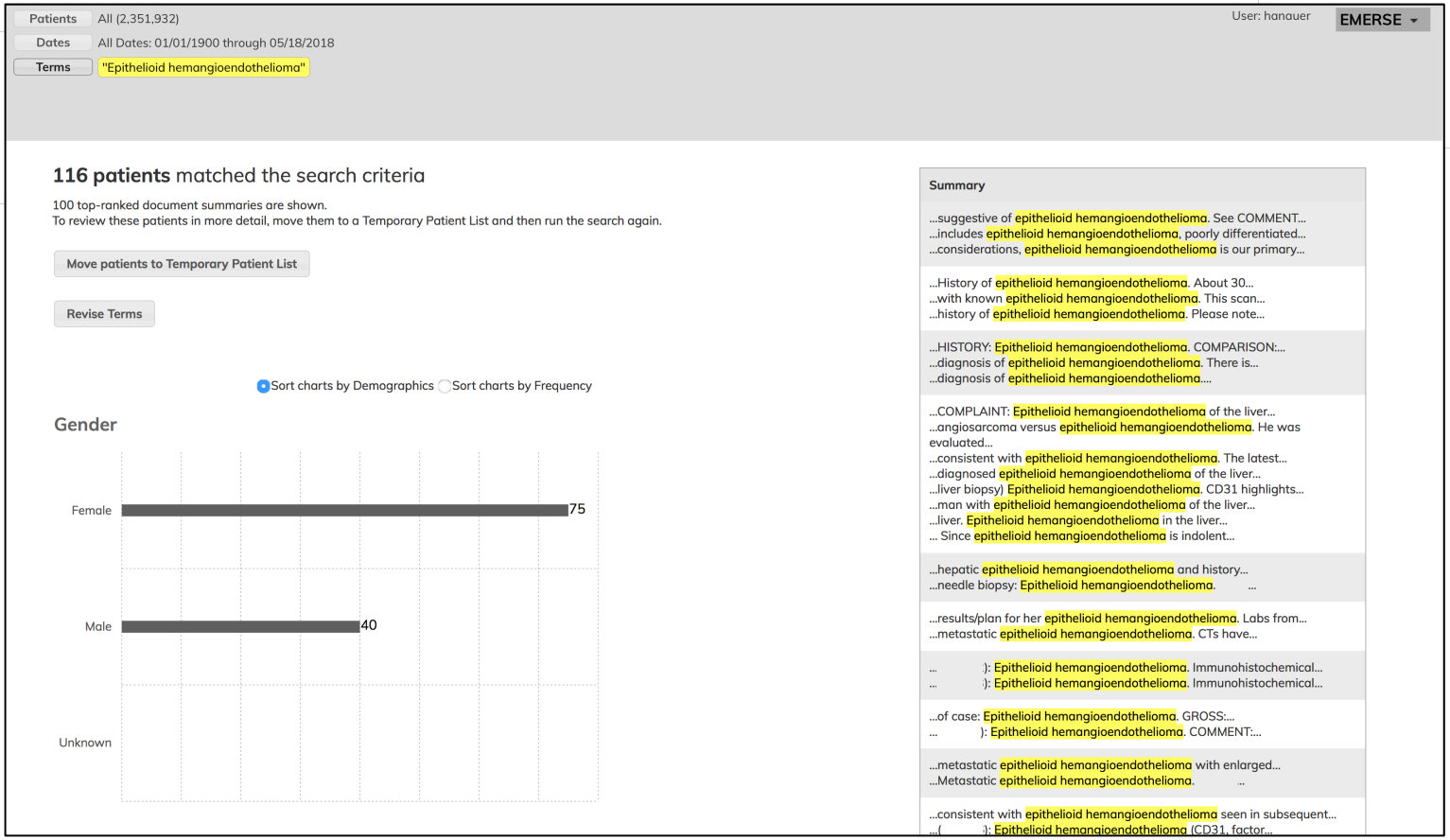
Easy to use for typical research staff

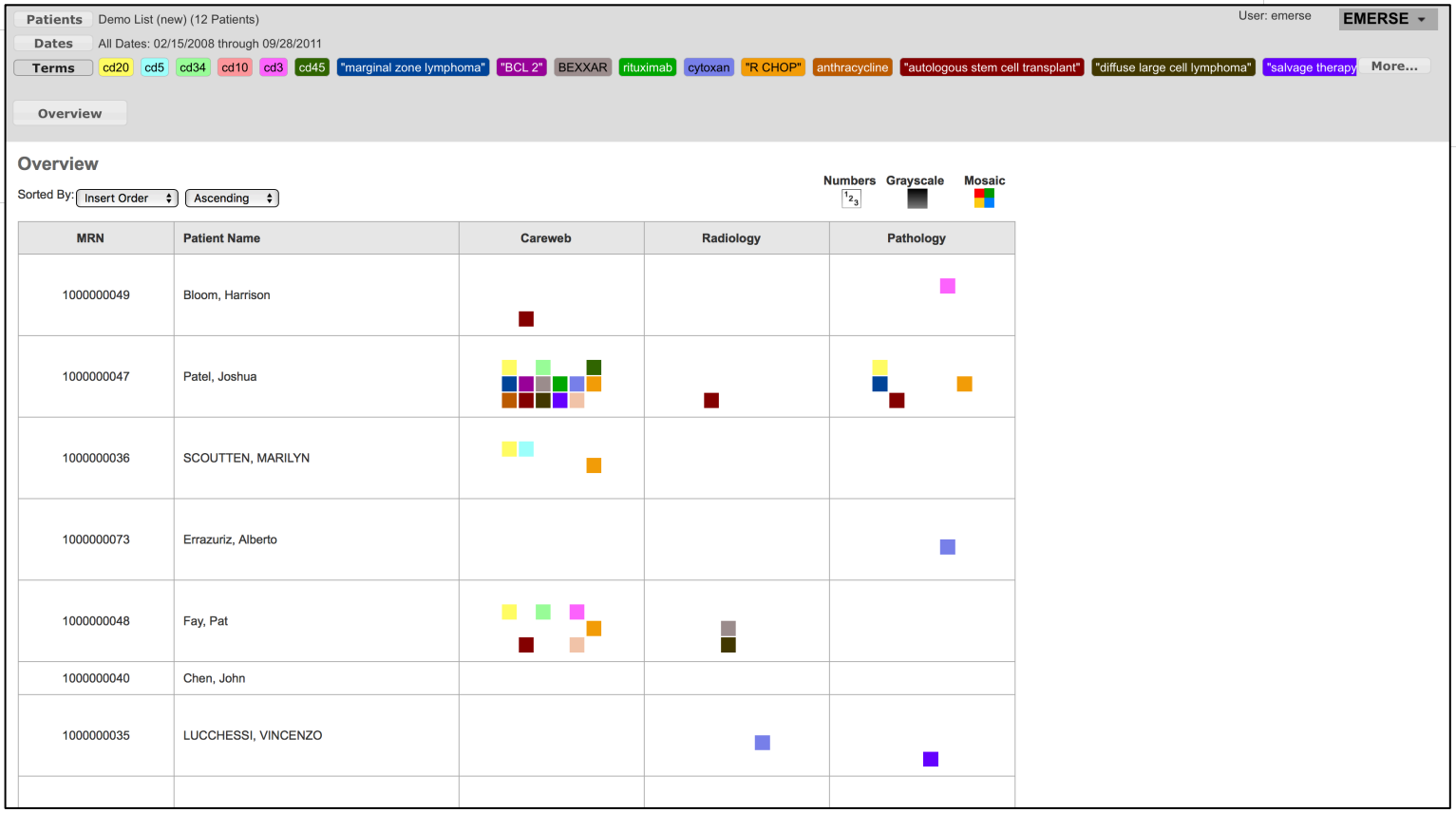
→ finds cohorts or highlights notes within a cohort

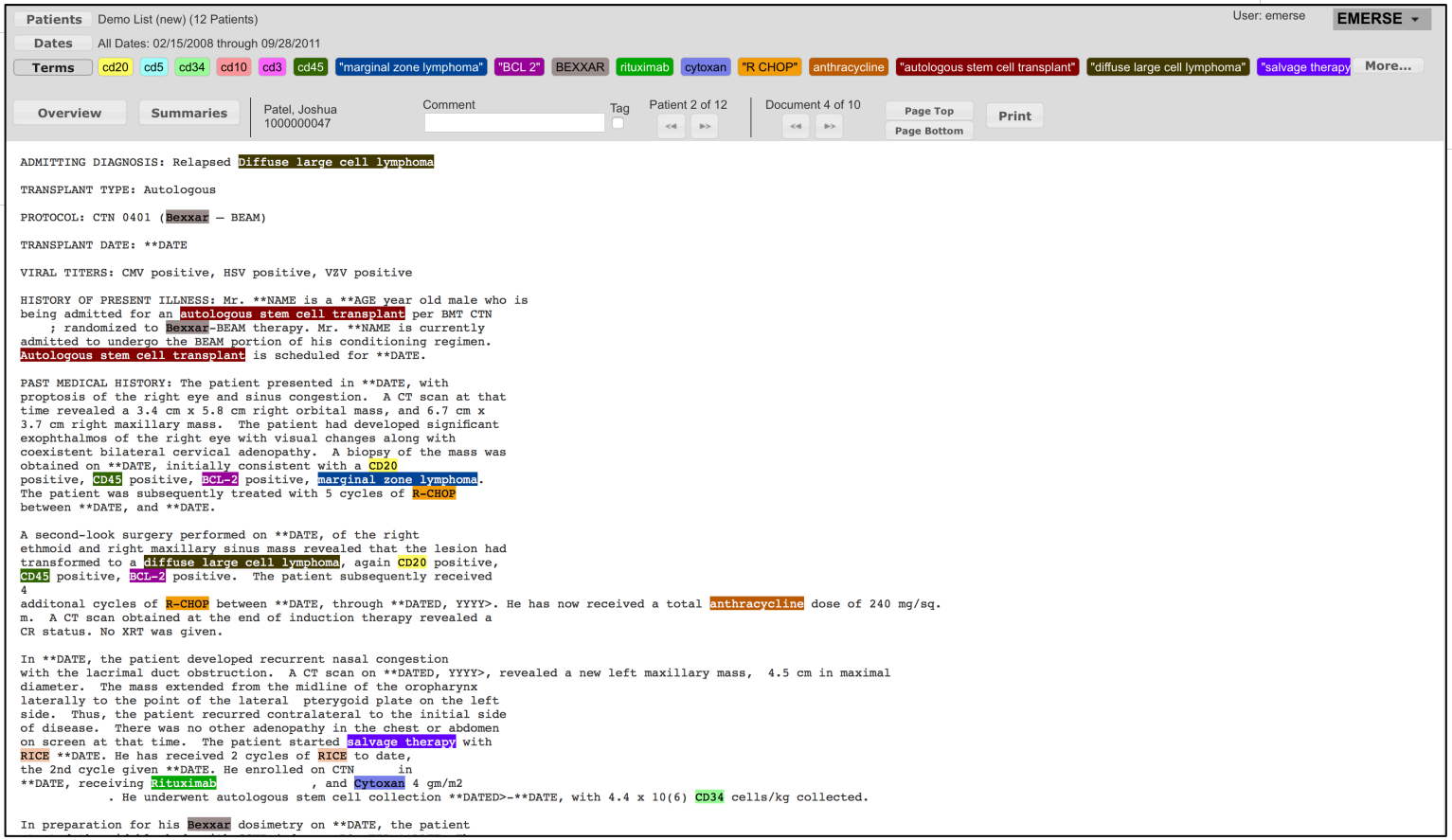
Scales well

Secure and regulatory compliant (audit logs, etc)

Simple—it's not full NLP, but often NLP isn't needed: "augmented intelligence"


Patients
All (2,351,932)
Dates
All Dates: 01/01/1900 through 05/18/2018
Terms
"Epithelioid hemangioendothelioma"
User: hanauer
EMERSE
116 patients matched the search criteria
100 top-ranked document summaries are shown.
To review these patients in more detail, move them to a Temporary Patient List and then run the search again.
Move patients to Temporary Patient List
Revise Terms
Sort charts by Demographics
Sort charts by Frequency
Gender
Female
75
Male
40
Unknown
Summary
...suggestive of epithelioid hemangioendothelioma. See COMMENT...
...includes epithelioid hemangioendothelioma, poorly differentiated...
...considerations, epithelioid hemangioendothelioma is our primary...
...History of epithelioid hemangioendothelioma. About 30...
...with known epithelioid hemangioendothelioma. This scan...
...history of epithelioid hemangioendothelioma. Please note...
...HISTORY: Epithelioid hemangioendothelioma. COMPARISON:...
...diagnosis of epithelioid hemangioendothelioma. There is...
...diagnosis of epithelioid hemangioendothelioma....
...COMPLAINT: Epithelioid hemangioendothelioma of the liver...
...angiosarcoma versus epithelioid hemangioendothelioma. He was evaluated...
...consistent with epithelioid hemangioendothelioma. The latest...
...diagnosed epithelioid hemangioendothelioma of the liver...
...liver biopsy) Epithelioid hemangioendothelioma. CD31 highlights...
...man with epithelioid hemangioendothelioma of the liver...
...liver. Epithelioid hemangioendothelioma in the liver...
... Since epithelioid hemangioendothelioma is indolent...
...hepatic epithelioid hemangioendothelioma and history...
...needle biopsy: Epithelioid hemangioendothelioma. ...
...results/plan for her epithelioid hemangioendothelioma. Labs from...
...metastatic epithelioid hemangioendothelioma. CTs have...
...): Epithelioid hemangioendothelioma. Immunohistochemical...
...): Epithelioid hemangioendothelioma. Immunohistochemical...
...of case: Epithelioid hemangioendothelioma. GROSS:...
...): Epithelioid hemangioendothelioma. COMMENT:...
...metastatic epithelioid hemangioendothelioma with enlarged...
...Metastatic epithelioid hemangioendothelioma. ...
...consistent with epithelioid hemangioendothelioma seen in subsequent...
...( ): Epithelioid hemangioendothelioma (CD31, factor...


Patients
Demo List (new) (12 Patients)
User: emerse
EMERSE
Dates
All Dates: 02/15/2008 through 09/28/2011
Terms
cd20
cd5
cd34
cd10
cd3
cd45
"marginal zone lymphoma"
"BCL 2"
BEXXAR
rituximab
cytoxan
"R CHOP"
anthracycline
"autologous stem cell transplant"
"diffuse large cell lymphoma"
"salvage therapy
More...
Overview
Overview
Sorted By:
Insert Order
Ascending
Numbers
Grayscale
Mosaic
MRN
Patient Name
Careweb
Radiology
Pathology
1000000049
Bloom, Harrison
1000000047
Patel, Joshua
1000000036
SCOUTTEN, MARILYN
1000000073
Errazuriz, Alberto
1000000048
Fay, Pat
1000000040
Chen, John
1000000035
LUCCHESSI, VINCENZO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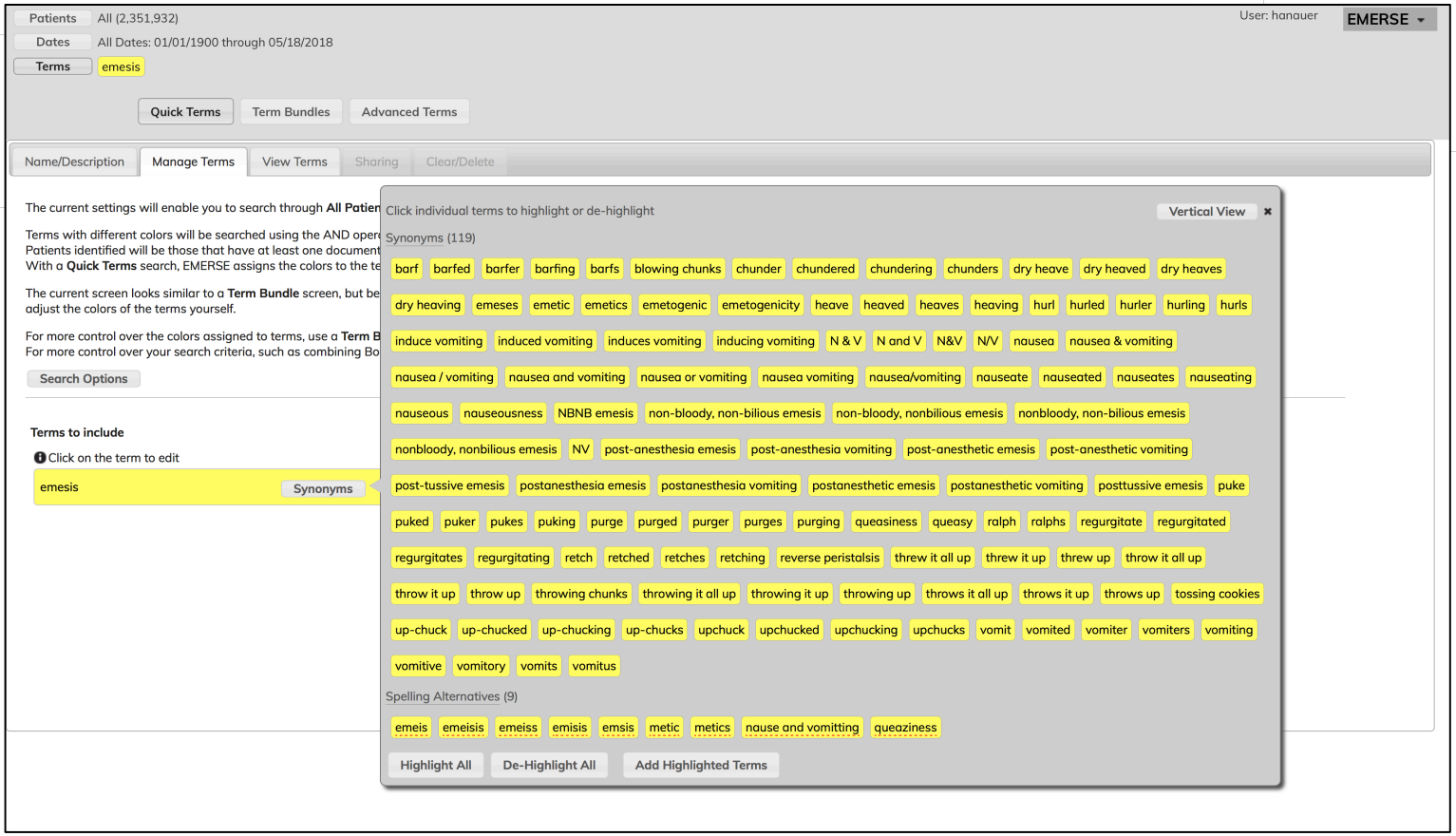
"salvage therapy
More...
Overview
Summaries
Patel, Joshua
1000000047
Comment
Tag
Patient 2 of 12
Document 4 of 10
Page Top
Page Bottom
Print
ADMITTING DIAGNOSIS: Relapsed Diffuse large cell lymphoma
TRANSPLANT TYPE: Autologous
PROTOCOL: CTN 0401 (Bexxar – BEAM)
TRANSPLANT DATE: **DATE
VIRAL TITERS: CMV positive, HSV positive, VZV positive
HISTORY OF PRESENT ILLNESS: Mr. **NAME is a **AGE year old male who is
being admitted for an autologous stem cell transplant per BMT CTN
; randomized to Bexxar-BEAM therapy. Mr. **NAME is currently
admitted to undergo the BEAM portion of his conditioning regimen.
Autologous stem cell transplant is scheduled for **DATE.
PAST MEDICAL HISTORY: The patient presented in **DATE, with
proptosis of the right eye and sinus congestion. A CT scan at that
time revealed a 3.4 cm x 5.8 cm right orbital mass, and 6.7 cm x
3.7 cm right maxillary mass. The patient had developed significant
exophthalmos of the right eye with visual changes along with
coexistent bilateral cervical adenopathy. A biopsy of the mass was
obtained on **DATE, initially consistent with a CD20
positive, CD45 positive, BCL-2 positive, marginal zone lymphoma.
The patient was subsequently treated with 5 cycles of R-CHOP
between **DATE, and **DATE.
A second-look surgery performed on **DATE, of the right
ethmoid and right maxillary sinus mass revealed that the lesion had
transformed to a diffuse large cell lymphoma, again CD20 positive,
CD45 positive, BCL-2 positive. The patient subsequently received
4
additonal cycles of R-CHOP between **DATE, through **DATED, YYYY>. He has now received a total anthracycline dose of 240 mg/sq.
m. A CT scan obtained at the end of induction therapy revealed a
CR status. No XRT was given.
In **DATE, the patient developed recurrent nasal congestion
with the lacrimal duct obstruction. A CT scan on **DATED, YYYY>, revealed a new left maxillary mass, 4.5 cm in maximal
diameter. The mass extended from the midline of the oropharynx
laterally to the point of the lateral pterygoid plate on the left
side. Thus, the patient recurred contralateral to the initial side
of disease. There was no other adenopathy in the chest or abdomen
on screen at that time. The patient started salvage therapy with
RICE **DATE. He has received 2 cycles of RICE to date,
the 2nd cycle given **DATE. He enrolled on CTN in
**DATE, receiving Rituximab , and Cytoxan 4 gm/m2
. He underwent autologous stem cell collection **DATED>-**DATE, with 4.4 x 10(6) CD34 cells/kg collected.
In preparation for his Bexxar dosimetry on **DATE, the patient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All Dates: 01/01/1900 through 05/18/2018
Terms
emesis
Quick Terms
Term Bundles
Advanced Terms
Name/Description
Manage Terms
View Terms
Sharing
Clear/Delete
The current settings will enable you to search through All Patien
Terms with different colors will be searched using the AND oper
Patients identified will be those that have at least one document
With a Quick Terms search, EMERSE assigns the colors to the te
The current screen looks similar to a Term Bundle screen, but be
adjust the colors of the terms yourself.
For more control over the colors assigned to terms, use a Term B
For more control over your search criteria, such as combining Bo
Search Options
Terms to include
Click on the term to edit
emesis
Synonyms
Click individual terms to highlight or de-highlight
Vertical View
Synonyms (119)
barf barfed barfer barfing barfs blowing chunks chunder chundered chundering chunders dry heave dry heaved dry heaves
dry heaving emeses emetic emetics emetogenic emetogenicity heave heaved heaves heaving hurl hurled hurler hurling hurls
induce vomiting induced vomiting induces vomiting inducing vomiting N & V N and V N&V N/V nausea nausea & vomiting
nausea / vomiting nausea and vomiting nausea or vomiting nausea vomiting nausea/vomiting nauseate nauseated nauseates nauseating
nauseous nauseousness NBNB emesis non-bloody, non-bilious emesis non-bloody, nonbilious emesis nonbloody, non-bilious emesis
nonbloody, nonbilious emesis NV post-anesthesia emesis post-anesthesia vomiting post-anesthetic emesis post-anesthetic vomiting
post-tussive emesis postanesthesia emesis postanesthesia vomiting postanesthetic emesis postanesthetic vomiting posttussive emesis puke
puked puker pukes puking purge purged purger purges purging queasiness queasy ralph ralphs regurgitate regurgitated
regurgitates regurgitating retch retched retches retching reverse peristalsis threw it all up threw it up threw up throw it all up
throw it up throw up throwing chunks throwing it all up throwing it up throwing up throws it all up throws it up throws up tossing cookies
up-chuck up-chucked up-chucking up-chucks upchuck upchucked upchucking upchucks vomit vomited vomiter vomiters vomiting
vomitive vomitory vomits vomitus
Spelling Alternatives (9)
emeis emeisis emeiss emisis emsis metic metics nause and vomitting queaziness
Highlight All
De-Highlight All
Add Highlighted Terms

Goals of the EMERSE project

Develop new functionality for the software

- Improved query suggestion
- Networking across sites (“SHRINE-like”)

Create the infrastructure for dissemination of an enterprise-level search tool

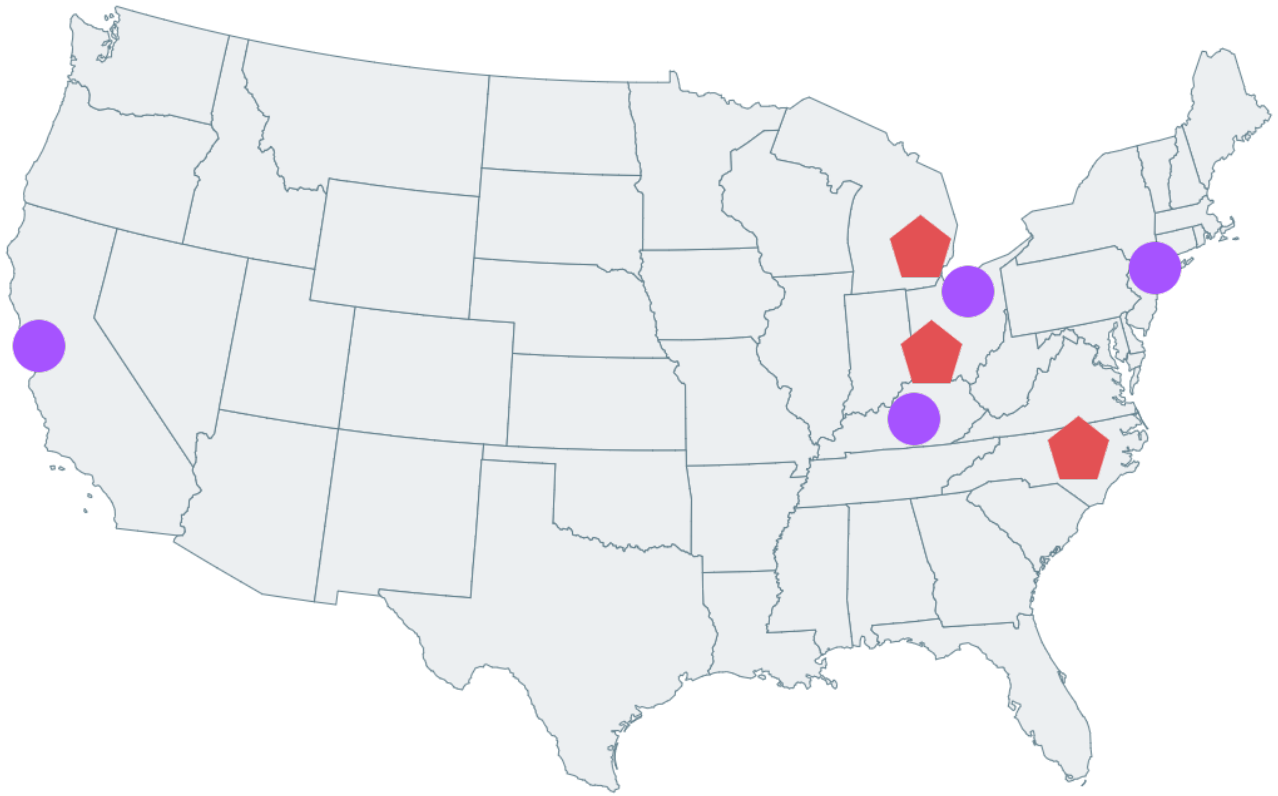
- Build the community
- Documentation for end-users and implementers
- Training materials

Engaging with users

Two kinds of “users”:

1. System implementers (who have many local challenges)
    - engagement with ITCR support
    - building the community
2. Standard users
    - engagement through training sessions (group and 1:1)
    - usability interviews
    - users often approach us with requests for features

EMERSE Sites



live

implementing

What ITCR support means

The ability to scale up from a local effort to a national one

The ability to build the infrastructure needed for broad dissemination

Protected time to engage with other sites, provide demos, etc

Protected time to engage with uses

Developer effort

A peer/mentoring network of ITCR software developers

Developing software in academic setting

Pros:

understand the challenging environment in which the software must exist

- access to the data
- regulatory concerns
- prioritization of projects with limited resources
- security

Cons:

shifting between local work vs national focus based on dual funding streams

other academic demands (teaching, publishing, etc)

security

Security

Quickly becoming a major concern and priority of medical centers

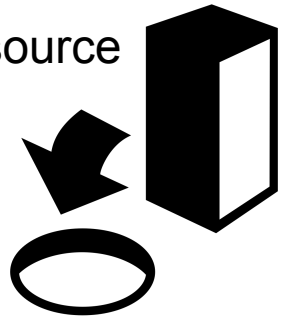
The days of installing any software in the clinical environment are gone

Rigorous security reviews are required before allowed to operate

Adds a major amount of time/effort/expense

Can never fall behind – otherwise, the plug gets pulled

Reviews designed for vendor software, doesn't work as well for open source



Security

cybersecurity technical design

risk assessment

information system contingency plan

stakeholders document

firewall change request

penetration testing

vulnerability scans

interconnect document

shared responsibility agreement

software security code review

vendor security assessment

This is a lot of work!

Acknowledgements

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Learn more about EMERSE

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ELECTRONIC MEDICAL RECORD SEARCH ENGINE

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project-emerse.org