

Electronic health records and the clinical narrative

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With the widespread adoption of EHRs, what happens to natural clinical language, and why should we care?

Providers



CHIEF COMPLAINT:
Shortness of breath.
HPI: This is a 68-year-old female who presents to the emergency department with shortness of breath going for several days
...

Coding Tools &
Services



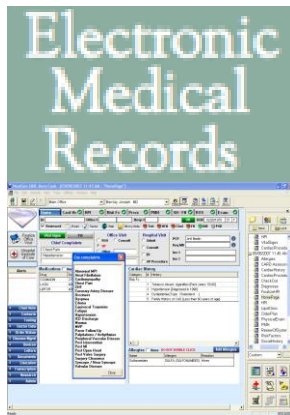
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Payers



Providers



12002
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Patients

Researchers

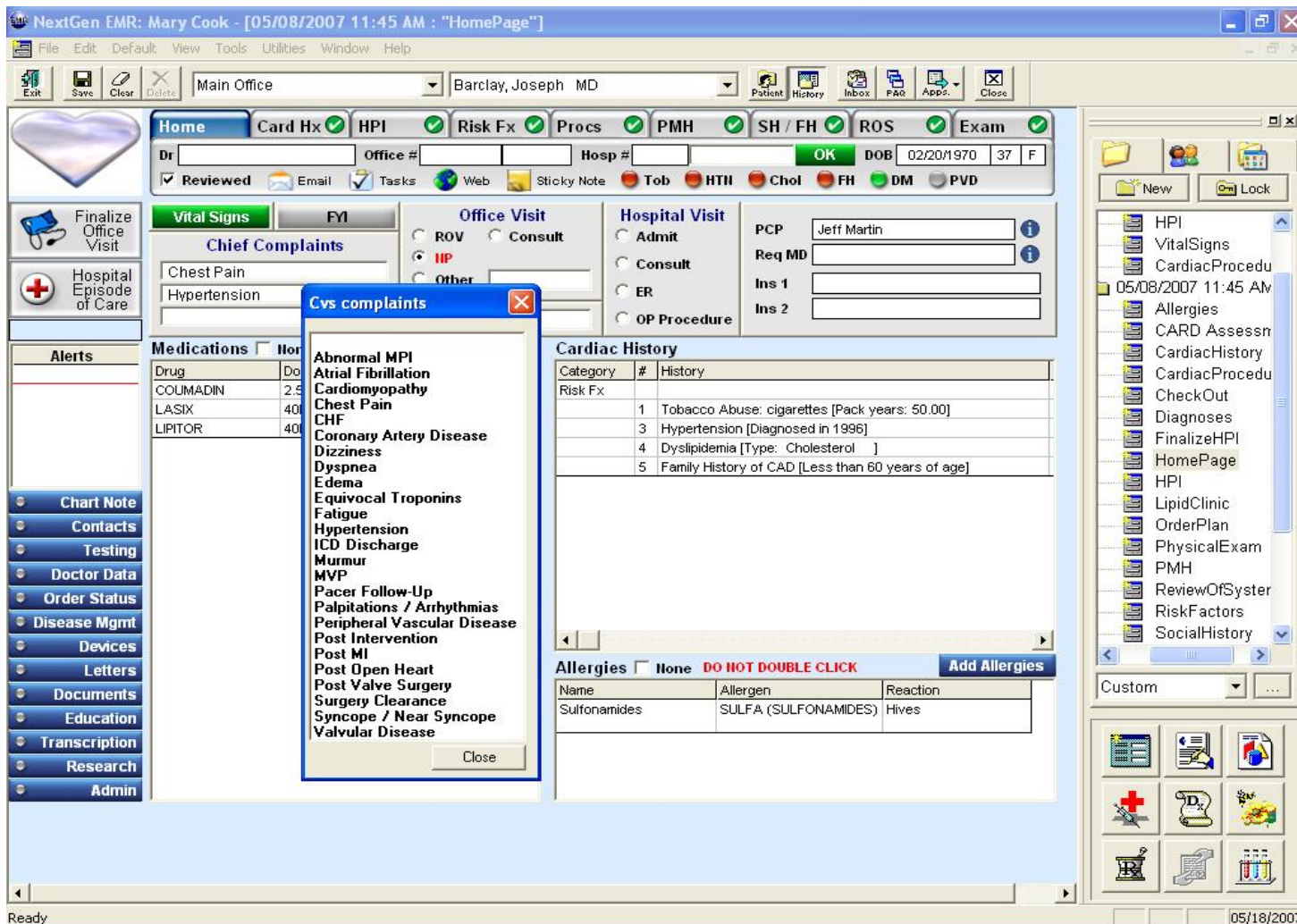


Clinicians

**Policy
makers**



Reimbursement
Meaningful use



Source: <http://www.nextgen.com/images/screenshots/card01.jpg>

“This system is designed for physicians to point and click their way through an entire exam quickly and effortlessly.” (EMR product review)

The clinical narrative

“...In years past, a **well-written history and physical, or progress note, would unfold like a story**, giving a vivid description of the patient’s symptoms and physical exam at the point of the encounter, as well as the synthesis of the data and the plan of care.”

- “EMRs: Finding a balance between billing efficiency and patient care”, Henry F. Smith, Jr., MD, Commentary, The Times Leader, Wilkes-Barre, PA, June 12, 2011.

April 14, 2007

CHIEF COMPLAINT: Shortness of breath.

HISTORY OF PRESENT ILLNESS: This 68-year-old female presents to the emergency department with shortness of breath that has gone on for 4-5 days, progressively getting worse. It comes on with any kind of activity whatsoever. She has had a nonproductive cough. She has not had any chest pain. She has had chills but no fever.

EMERGENCY DEPARTMENT COURSE: The patient was admitted. She has had intermittent episodes of severe dyspnea. Lungs were clear. These would mildly respond to breathing treatments and morphine. Her D-dimer was positive. We cannot scan her chest; therefore, a nuclear V/Q scan has been ordered. However, after consultation with Dr. C, it is felt that she is potentially too unstable to go for this. Given the positive D-dimer and her severe dyspnea, we have waved the risks and benefits of anticoagulation with her heme-positive stools. She states that she has been constipated lately and doing a lot of straining. Given the possibility of a PE, it was felt like anticoagulation was very important at this time period; therefore, she was anticoagulated. The patient will be admitted to the hospital under Dr. C.

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May 3, 2007

EMERGENCY DEPARTMENT COURSE: The patient was admitted and nontoxic in appearance. **Blood pressure was brought down aggressively. With this combined with BiPAP, she has reversed her respiratory distress promptly.** She has improved significantly. She will not require intubation at this time period. Her family has elected to go back to M, Dr. W. I did discuss this case with Dr. G who is on call for L Cardiology. She has accepted him in transfer; however, there are no PCU or ICU beds at this time period. Will admit here for a brief period until a bed is available at M. I discussed this case with Dr. R who will admit.

Clinicians were trying to determine whether the shortness of breath was due exclusively to her failing heart, or whether she has pneumonia.

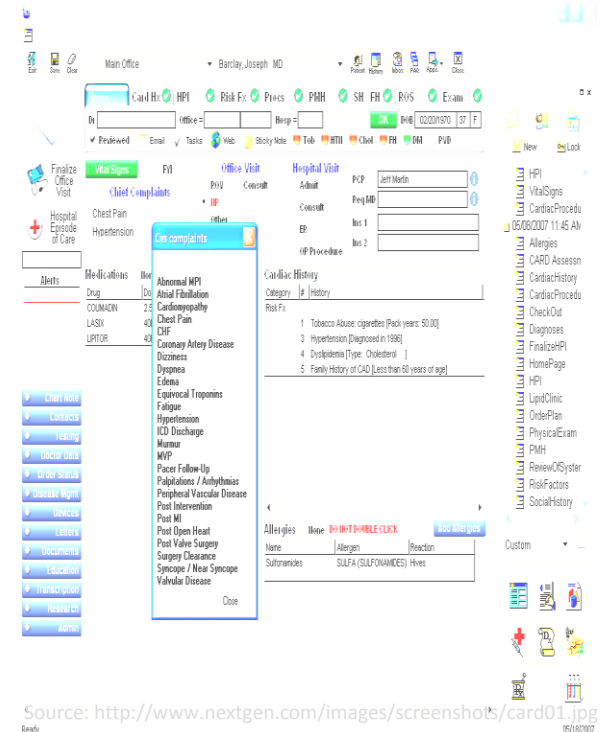
Prompt response indicates that pneumonia is not the issue.

I worry that EMRs as implemented can actually downgrade the quality of information passed between health care teams

- Henry F. Smith, Jr., MD, “EMRs: Finding a balance between billing efficiency and patient care”, Commentary, The Times Leader, Wilkes-Barre, PA, June 12, 2011.

A head-to-head comparison

Mr. John Roe was seen in our office today in follow up of his paroxysmal atrial fibrillation. As you know, he is a 57-year-old gentleman who had electrical cardioversion in May 2002 and had been maintained on Betapace since that time. His last visit in our office was July 23, 2003. He recently called our office in February stating he was back in atrial fibrillation which was documented on electrocardiogram. I elected to increase his sotalolol to 160 mg twice a day and he did convert back to normal sinus rhythm. We had recommended Coumadin to him at that time but he did not start any Coumadin. He has done well since with no recurrence of arrhythmia and he is acutely aware of when he goes into the fibrillation. He denies any shortness of breath, chest discomfort or congestive heart failure symptoms and has otherwise felt quite well. His only medication is the Lexa pro 10 mg a day as an antidepressant and the Betapace. His review of systems is otherwise unchanged and negative.



Resnik et al. Communication of Clinically Relevant Data in Electronic Health Records: A Comparison between Structured Data and Unrestricted Physician Language, AHIMA, 2007.

Both experts

Considered an omission only if *both* experts identified it as an omission

Seriousness of omission	5	≥ 4	≥ 3
Percentage of documents	0%	50%	85%
Average omissions per document	0	0.6	1.85

- Some omissions seem straightforward to remediate with easy changes to the EMR specification, e.g.
 - Negative patient reports (“denies SOB”)
 - Degrees for symptoms (“mild/severe pain”)
 - Reactions to allergies (“rash/hives”)

Results, disregarding “remediable” omissions

Both experts

Considered an omission only if *both* experts identified it as an omission

Seriousness of omission	5	≥ 4	≥ 3
Percentage of documents	0%	25%	50%
Average omissions per document	0	0.3	0.95

Difficult to remediate

- **Nuanced/detailed elaborations**

- “able to walk on flat levels and walk at a moderate pace for one hour without abnormal shortness of breath or chest pain”

- **Temporal/logical context**

- ventricular tachycardia occurred “during post myocardial infarction care...far removed from the time of [patient’s] infarction”
- the dictating physician was “hesitant to recommend [patient’s] FAA certification renewal” without a repeat of a previous catheterization

- **Dictating physician’s thought process**

- recommends continuing Toprol because it “seems to be controlling [the patient’s] palpitations well”
- considers discomfort to be “suggestive of angina”
- believes that results of stress testing “would rule out significant major coronary artery disease, despite it being a somewhat incomplete study”

Difficult to remediate: the things that make the clinical narrative a *narrative*

“...As EMRs proliferate, and increased Medicare scrutiny looms, **medical documentation is evolving from its original goal of recording what actually was going on with a patient, and what the provider was actually thinking, to sterile boilerplate documents** designed to justify the highest billing codes.

- “EMRs: Finding a balance between billing efficiency and patient care”, Henry F. Smith, Jr., MD, Commentary, The Times Leader, Wilkes-Barre, PA, June 12, 2011.

If you lose the language, you lose the story.

A dilemma

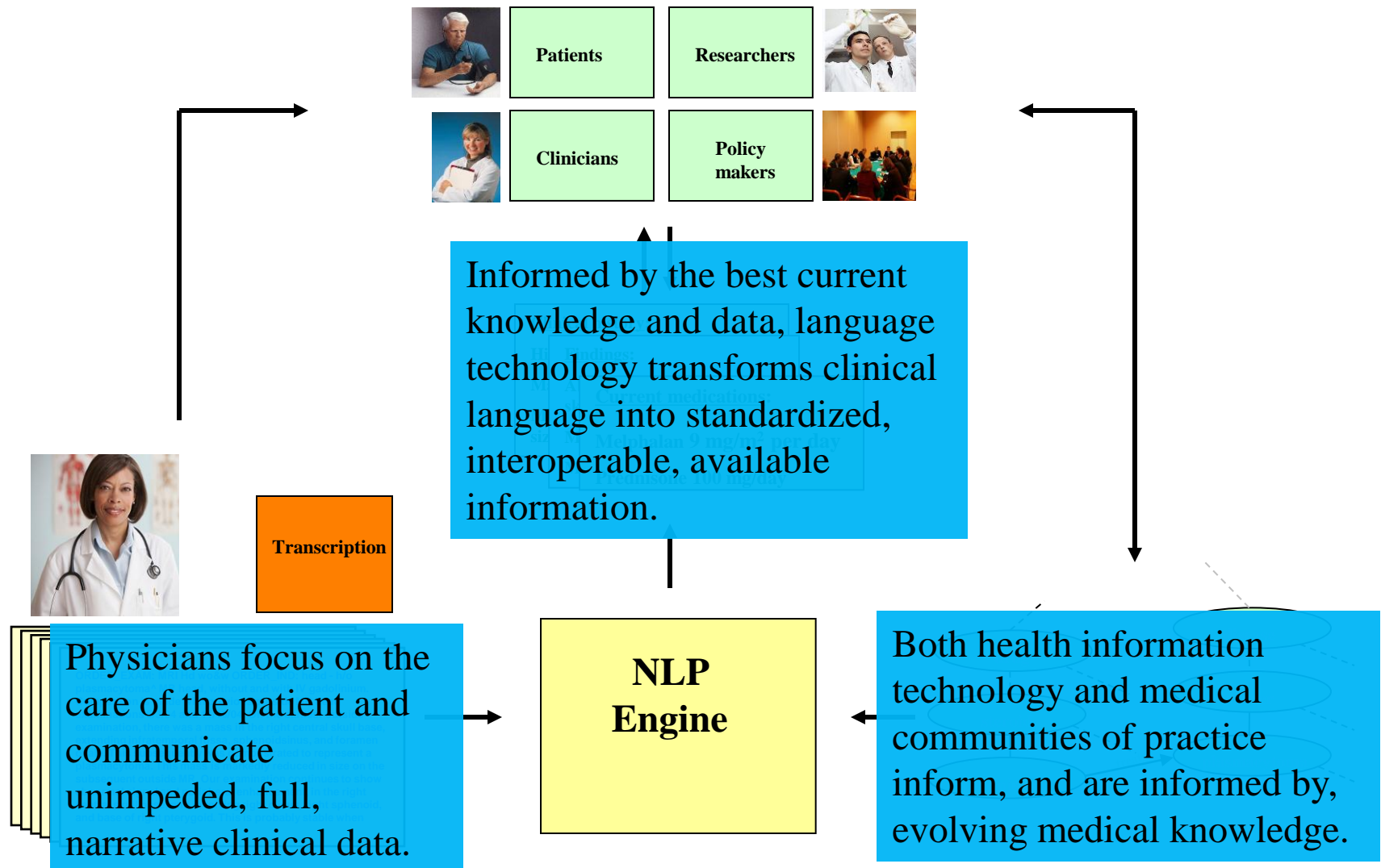
- The future of healthcare depends on structured information we can aggregate and analyze.
- EMRs are widely viewed as the way to get there.
- But typical EMRs threaten to
 - eliminate or fragment crucial language in the record
 - omit information that clinicians need in order to communicate effectively
 - destroy the knowledge discovery cycle

Language and the discovery cycle

- Structured input encodes the clinical concepts we already know are important.
- Language contains clinical content that we might only discover to be important later.
 - First febrile seizure (Kimia et al. 2009)
 - Head lag
 - Swallowed magnet
- With structured input, that language never gets created.



A way forward: recognizing that structured datasets \neq structured input



Thanks!

To follow up: resnik@umd.edu