Getting to a Great Problem List, and How That List Can Help Prevent Burnout

Physician Executive Summit
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Meet Our Speakers

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UW Health

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The Center for ProMaps at the University of Wisconsin School of Medicine creates problem concept maps that can be licensed with no fee.

Current donors to the project include:

- eClinicalWorks
- Epic
- Intelligent Medical Objects
- One Anonymous Donor
Conflict of Interest

Dr. Buchanan and Dr. Wright have no real or apparent conflicts of interest to report.
Agenda

• The Problem Oriented Medical Record
• Improving the Accuracy of the Problem List
• Auto-Summaries and the Problem Oriented View (POV)
• Problem Concept Maps (PCMs)
• Impact of the Problem Oriented View on Clinical Data Retrieval
• Other Use Cases for PCMs and Future Work
Learning Objectives

• Identify methods to improve the accuracy of the problem list
• Summarize the use of a Problem Oriented View (POV) for auto-summarization of EHR data and the benefits that accrue from the use of POV
• Explain how ProMaps (a vendor-neutral, publicly available terminology) is used to implement a POV of clinical data
GETTING TO A GREAT PROBLEM LIST, AND HOW THAT LIST CAN HELP PREVENT BURNOUT

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Defining the problem list

AHIMA
Problem lists used within health records are a list of illnesses, injuries, and other factors that affect the health of an individual patient, usually identifying the time of occurrence or identification and resolution.

ONC/CMS Meaningful Use:
A list of current and active diagnoses as well as past diagnoses relevant to the current care of the patient.

Users
• “The problem list is for nontransitive illnesses.”
• “A problem is anything ongoing or active that I’m working on with the patient.”
• “The problem list is a place to have a summary of the most important things about a patient.”
GETTING TO A GREAT PROBLEM LIST, AND HOW THAT LIST CAN HELP PREVENT BURNOUT

SPECIAL ARTICLE

MEDICAL RECORDS THAT GUIDE AND TEACH

Lawrence L. Weese, M.D.*

T HERE begins a clinical clerk, the nurse of his practice, and the practitioner physician are all confronted with conditions that are frustrating in every phase of medical action. The purpose of this article is to 

1. Identify and discuss these conditions and point out solutions. To deal effectively with these frustrations it will be necessary to develop a more organized approach to the medical record, a more rational

*Medical Director, U.P.C. Crosw, Cleveland Metropolitan General Hospital, Western Reserve University School of Medicine; author of "Why We Missed the Diagnosis," "The Medical Record," and "Medical Records That Guide and Teach."
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Are people using the problem list?

Problem list and quality

- Study by Hartung et al. at Portland VAMC

- Results:
  - “Likelihood of therapy with either an angiotensin converting enzyme inhibitor or angiotensin II receptor blocker was higher in patients who had heart failure listed on their problem list compared to patients who did not (92.2% vs 76.7%; P<05).”

  - “Patients with accurate problem list entries were also more likely to receive digoxin (61.1% vs 36.7%; P=.001) and spironolactone (26.7% vs 13.3%; P=.025). There were no differences in the use of beta-blockers between the 2 groups.”

Secondary Uses of the Problem List
Clinical Decision Support

- Patient 65 yrs or older, due for Framingham.
- Patient 50 years old or greater, recommend influenza vaccination.
- Finger pulse oximetry for patients 65 years or older. Faint indicates average pulse for cerebral cortex.
- Diabetic patient is overdue for HbA1c measurement (recommended every 9 months).
- Diabetic patient with new diabetes, consider starting metformin: converting enzyme inhibitor (ACE-I).
- Patient has CAD or equivalent, consider starting antiplatelet therapy, but potential contraindications exist.
- Patient is overdue for blood pressure assessment (recommended weekly).

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Clinical Decision Support

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Quality Measurement

Asthma Medications: Ages 12 to 50

<table>
<thead>
<tr>
<th>Organization</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brigham and Women's Physicians Organization</td>
<td>93%</td>
</tr>
<tr>
<td>Massachusetts General Physicians Organization</td>
<td>87%</td>
</tr>
<tr>
<td>Newton-Wellesley Physician Hospital Organization</td>
<td>89%</td>
</tr>
<tr>
<td>North Shore Health System</td>
<td>87%</td>
</tr>
<tr>
<td>Affiliated Pediatric Practices</td>
<td>99%</td>
</tr>
<tr>
<td>Cape Ann Medical Center*</td>
<td>88%</td>
</tr>
<tr>
<td>Charles River Medical Associates</td>
<td>93%</td>
</tr>
<tr>
<td>Emerson Physician-Hospital Organization</td>
<td>88%</td>
</tr>
<tr>
<td>Lawrence Memorial Hospital</td>
<td>82%</td>
</tr>
<tr>
<td>Melrose-Wakefield Hospital</td>
<td>84%</td>
</tr>
<tr>
<td>Pentucket Medical Associates</td>
<td>92%</td>
</tr>
<tr>
<td>Plymouth Medical Group</td>
<td>88%</td>
</tr>
<tr>
<td>Tri-County Medical Associates</td>
<td>90%</td>
</tr>
</tbody>
</table>

Partners HealthCare

Massachusetts State Average
Registries and Care Management
Clinical Research
Translational Research

ABO, ALB, APC, APP, ASPM, BCL2, BDNF, CCR5, CD4, CD8, CDH1, CFTR, CREBBP, CRH, CXCR4, DHFR, GAST, HFE, IL10, IL2, INS, KRT14, KRT5, LCK, LEP, LIF, MCM6, MEFV, MYH7, MYOD1, NPPB, OSM, PGL2, PHF8, PIP, PKC, RHO, SDHB, SDHC, SDHD, SLC18A2, SRY, TSC1, TSC2

Diabetes

?
Getting Paid: P4P and MU

• Total at risk for BWPO is $735,000
• BCBS: 75% complete for DM, HTN and CVD (combined)
• HPHC: 70% complete for DM, HTN and CVD (must clear 70% for each problem)
• 80% problem list completeness was also a requirement for Stage 1 Meaningful Use
Team coordination and communication

What if, for each problem, we knew:

• Who diagnosed it?
• How it was doing from the patient and care team perspective?
• Which care provider is responsible (jointly with the patient) for it?
• Which care providers are involved?
• What tasks and input are needed from each member of the care team to manage the problem?
Patient engagement

Patient engagement

Patients' Actions Following Viewing their Problem List

- Called healthcare provider
- Made appt with healthcare provider
- Messaged healthcare provider
- Researched condition on the internet
- Researched condition somewhere other than the internet
- Discussed condition w/ friend or family
- Changed a health behavior
- Plan to change behavior

Percentage of patients who took action
Indication-based ordering

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### Migraine Headache Prevention Drug Order

**Suggested Choice:**
- Metoprolol Succinate (Toprol-XL) **Beta-Blocker**

**Alternatives:**
- Other Beta-Blockers
- Non Beta-Blockers

**Not Recommended:**
- Amitriptyline (Elavil)
- Divalproex Sodium Extended-Release (Depakote ER)
- Topiramate (Topamax)

### Patient’s Active Migraine Drugs:

<table>
<thead>
<tr>
<th>Drug</th>
<th>Started</th>
<th>Actions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Naproxen tablet (Aleve) 220mg</td>
<td>1/2/2015</td>
<td>Refill Edit Stop</td>
</tr>
</tbody>
</table>

### Patient’s Inactive Migraine Drugs:

<table>
<thead>
<tr>
<th>Drug</th>
<th>Dates Taken</th>
<th>Reason Stopped</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amitriptyline (Elavil) 25mg tablet</td>
<td>1/2/2014 - 1/1/2015</td>
<td>Patient didn’t tolerate - caused dizziness</td>
</tr>
</tbody>
</table>

### Non-Pharmacologic Options:
- Biofeedback
- Relaxation
- Cognitive-behavioral therapy
- Acupuncture
- Transcutaneous electrical nerve stimulation
Incorporating Indications into Medication Ordering — Time to Enter the Age of Reason

Gordon D. Schiff, M.D., Enrique Sesma-Yazquez, Ph.D., and Adam White, Ph.D.

A 1993 article in the Journal of the Medical and Surgical Journal (November of the New England Journal of Medicine) described how medications should be prescribed. It emphasized the importance of knowing the names of the medications and the indications for which they are prescribed. The article noted that prescribing should be done with care, without a checklist. The article also mentioned that prescribing should be based on clinical judgment, not on a checklist.

The image shows a page from the New England Journal of Medicine. The page is titled "Incorporating Indications into Medication Ordering — Time to Enter the Age of Reason." The article is by Gordon D. Schiff, M.D., Enrique Sesma-Yazquez, Ph.D., and Adam White, Ph.D.

The article discusses the importance of incorporating indications into medication ordering. It emphasizes the need for clinicians to understand the indications for which medications are prescribed, rather than relying on checklists. The article suggests that incorporating indications into medication ordering can help prevent burnout.

The abstract of the article states: "Incorporating Indications into Medication Ordering — Time to Enter the Age of Reason. A 1993 article in the Journal of the Medical and Surgical Journal (November of the New England Journal of Medicine) described how medications should be prescribed. It emphasized the importance of knowing the names of the medications and the indications for which they are prescribed. The article noted that prescribing should be done with care, without a checklist. The article also mentioned that prescribing should be based on clinical judgment, not on a checklist."
Improving Problem List Accuracy
Multi-site Study

• Looked at 10 sites with EHRs across the world

• What proportion of patients with HbA1c ≥ 7.0% had diabetes on their problem list?

• Ranged from 60.2% to 99.4%

• Developed best practices based on experience at leading organizations

**Best Practices**

- Make it easy to document problems
- Make it fundamental to care
- Create tools and processes for improving and reconciling the problem list
- Report on gaps
- Provide incentives
- Set expectations, define roles and create culture
- Create user experience benefits for problem list users

## Discharge Problem List

Review all problems to determine which can be resolved and which still require a plan for treatment after discharge.

### Likely to be resolved prior to discharge
- **Acute respiratory failure**
- **Dehydration, mild (Resolved)**

### Likely to need additional annotation or resolution
- **Dysphagia**
- **Elevated liver function tests**

### Unlikely to be resolved prior to discharge
- **Type 2 diabetes mellitus with complication**

Mark as Reviewed: Last Reviewed by Peter Yorba, MD on 4/7/2015 at 10:38 AM

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**Care Coordination Note**

- View Drug-Disease Interactions
- Show Fast Problems

- Mark Unreconciled Active
Important (Advisory: 1)

Patient has had a BNP > 400 pg/mL and is taking at least one medication involved in the management of heart failure, but heart failure is not on the problem list. Add heart failure to problem list if appropriate.

Last BNP=453 Collected on 1/27/2017

Add Problem  Do Not Add  Congestive heart failure  Edit details (Share with patient)

Acknowledge Reason

Patient does not have heart failure  Defer

Enter comment

Accept  Dismiss
Problem List: Definition, Etiquette and Expectations

The Problem List is a crucial piece of a patient’s medical record that all clinicians caring for a patient are expected to update and manage. An up-to-date Problem List will greatly assist in clinical care and documentation.

Health Link Problem List Definition

The Problem List is defined as the electronic list of diagnoses and conditions that have an impact on future medical care.

Problem List Management (Etiquette):

1. Clinicians in primary care, specialty and inpatient settings should actively manage the Problem List. Providers include physicians, nurse practitioners and physician assistants. Clinicians include providers, nurses, pharmacists, respiratory therapists, dietitians, physical therapists, occupational therapists, speech therapists, nurse case managers, outcome managers, social workers, and health psychologists.
   a. Non-provider clinicians may add medical diagnoses that have been made and documented in Health Link by a provider, or communicated directly from a provider to a non-provider clinician, e.g. acute myocardial infarction, drug overdose, torn rotator cuff, exacerbation of COPD.
   b. Non-provider clinicians may add specified diagnosis for new, complex, chronic or recurring medical problems or situations that require a consistent interdisciplinary plan of care for ongoing management, e.g. a pediatric “poke plan” to help decrease the discomfort of needle sticks.
Topics for a Problem List Policy / Guide

- What goes on the problem list?
- Who can (or must) edit the problem list?
- When must the problem list be created, updated and reconciled?
- How long should things remain on the problem list?
- What is etiquette around editing/resolving problems, especially those added by others?
Retrieval and Use of EHR Data
Paradigm Shift:

Source Model → Problem Oriented Model
The......split-attention effect\(^1\) occurs when clinicians must interact with multiple sources to acquire and synthesize information.....

\(^1\)Harry E, et. al., *Cognitive Load and Its Implications for Health Care*, *NEJM Catalyst*. Published 2018 March 14.

In just three years, physician burnout increased from 45.5 percent to 54.4 percent, according to a paper authored by doctors at the University of California, Riverside School of Medicine.

*American Journal of Medicine, August, 2018*

Stanford’s Chief Wellness Officer Aims To Prevent Physician Burnout

*Washington Post, August 3, 2018*

The Widespread Problem of Doctor Burnout

*New York Times, August 23, 2012*
**Solution**: Problem Oriented Views

- A Problem Oriented View (POV) will present the clinician with relevant data for the patient’s diagnoses

- POV will decrease the cognitive burden required to collect and synthesize information

- POV acts as an *auto-summarizer*

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Current State: The Problem List

**Problem List**

- **ENDOCRINE**
  - Diabetes [MLC]
- **NEUROLOGIC**
  - Epilepsy [MLIPC H]
- **MUSCULOSKELETAL**
  - Degenerative Joint Disease [MLC]

Current State: Data in EHR Silos

- **Imaging Results**
- **Medication List**
  - Acetaminophen
  - Glipizide
  - Ibuprofen
  - Jardiance
  - Lamotrigine
  - Metformin
  - Midazolam
- **List of Lab Results**
- **Prior Procedures**
An EHR that organizes relevant patient information for a disease in one window as described above reduces the consequences of split-attention effect.
Q: How do we enable problem oriented views?

A: (1) **Problem Concept Map Knowledge Bases** from Our Team and SMEs
(2) **Software** produced by EHR developers and other technology companies

Sample Knowledge Base for Diabetes

![Diabetes Problem Concept Map: Lab Tests and Medications (Partial Listing)]
The *UW Center for ProMaps* creates and maintains problem concept maps. These ProMaps are vendor-neutral and available as a freely licensed ontology of health concepts, oriented around patient problems. EHR developers and other technology companies may use ProMaps to create problem oriented views or may develop other use cases.
Map Creation Process

Modified Delphi Technique to Achieve Expert Consensus via Google Sheets

<table>
<thead>
<tr>
<th>COPD Medications</th>
<th>Ohio State</th>
<th>Vanderbilt</th>
<th>Stanford</th>
<th>U of Washington</th>
<th>U of Wisconsin</th>
<th>UT-SW</th>
</tr>
</thead>
<tbody>
<tr>
<td>Add. Med. Sugg. by</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pharm Subclass</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Medication</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Status: Include, Excl.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- On-line interaction and phone discussion
We have assembled a team including:

- Pharmacy Domain Expert
- Lab Domain Expert
- Project Manager
- Physician Leads
  - Project Director
    Dr. Joel Buchanan
    University of Wisconsin
  - Co-Director
    Dr. Mike Semanik
    University of Wisconsin
  - Lead Mapping Physician
    Dr. Juanita Halls
    University of Wisconsin
  - Director of Problem Definitions (SNOMED Groupers)
    Dr. DuWayne Willett
    UT-Southwestern
Problem Oriented View Study

• Epic simulation environment was used to display data in two Views:
  • The Problem Oriented View (POV)
  • The Standard View (Epic standard)

• 3 institutions, 51 participants (internal medicine residents)

• Participants asked to answer questions using the two Views; cases test ability to extract data from EHR, not clinical knowledge
  • E.g., “John has hypothyroidism. When was his TSH last checked?”

• Funded by CTSA Pilot Grant
• Published in JAMIA
Study Hypotheses

• The Problem Oriented View will allow participants to complete their cases:

| More Quickly | More Accurately (Lower Error Rate) | With Greater User Satisfaction (SUS)¹ | With Less Cognitive Work (NASA-TLX)² |


## Study Results

<table>
<thead>
<tr>
<th>More Quickly</th>
<th>More Accurately (Lower Error Rate)</th>
<th>With Greater User Satisfaction (SUS)</th>
<th>With Less Cognitive Work (NASA-TLX)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Traditional</td>
<td>Traditional</td>
<td>Traditional</td>
<td>Traditional</td>
</tr>
<tr>
<td>205 sec</td>
<td>POV</td>
<td>POV</td>
<td>POV</td>
</tr>
<tr>
<td>173 sec</td>
<td>7.7%</td>
<td>41.3</td>
<td>0.99</td>
</tr>
<tr>
<td>POV faster by 32 seconds</td>
<td>POV reduces error rate by 56%</td>
<td>POV more satisfying by 17.2 points</td>
<td>0.72</td>
</tr>
<tr>
<td>p = 0.0002</td>
<td>p = 0.0037</td>
<td>Scale 0 – 70, 70 best experience</td>
<td>POV less cognitive work by 0.27 points</td>
</tr>
<tr>
<td></td>
<td></td>
<td>p &lt; 0.0001</td>
<td>Scale 0.4 – 2.8, 2.8 most cognitive work</td>
</tr>
</tbody>
</table>

- N = 51 participants
Volume 28, Issue 5, May 2021

EDITORIAL
Includes significant discussion of our world!
Health information technology and clinician burnout: Current understanding, emerging solutions, and future directions
Eric G. Poon,望申研，(category)海望
Abstract ▼ View article Supplementary data

RESEARCH AND APPLICATIONS
Impact of a problem-oriented view on clinical data retrieval
Michael C. Zimmerman, Peter C. Reineke, Adam Sargent, Daniel A. Weldon, Shunmukh et (category)海望
Abstract ▼ View article Supplementary data

Empowering physicians with health information technology: An empirical investigation in Chinese hospitals
Yang Chen, Rui Lin, Jiuhua Luan, Shengtao He
Abstract ▼ View article Supplementary data

Physicians’ electronic tribus work patterns and factors associated with high tribus work volume
Patrícia Abiss, Götz Marx, E. Margaret Warriner, Ivey E Reed, Stephanie Proust et (category)海望
Abstract ▼ View article Supplementary data
clinician burnout through improving EHR usability requires a continuous approach, as vendors and their clients need to work together to turn their focus away from technology embedded in work—as—imagined toward sociotechnical systems supporting work—as—done.

EHR vendors should also recognize that they can and should partner with informatics innovators to advance EHR usability and mitigate clinician burnout. In a block-randomized study, Semanik et al. found that problem—oriented summaries of clinical data, built directly into a vendor EHR, allowed clinicians across three academic medical centers to retrieve data faster and with fewer errors. With the use of this tool, clinicians also reported a reduced cognitive load and increased satisfaction. This article by Semanik et al demonstrates how EHR vendors could support efforts to mitigate burnout by spreading and sustaining usability innovations coming from an individual customer across their customer base.

Future directions

So where does the topic of informatics and clinician burnout go from here? Perspectives articles from several ACMI members offer new lenses through which to view, understand, and address HIT—associated clinician burnout. Williams contended

Health information technology and clinician burnout: Current understanding, emerging solutions, and future directions

Eric G Poon, S Trent Rosenbloom, Kai Zheng

“Physicians at the University of Wisconsin and University of Texas-Southwestern have developed tables of mappings from problem categories (e.g. renal failure, ischemic heart disease to observations, and to medications) with mappings developed through a multi-institutional consensus process with universal code specifications —that use SNOMED CT or ICD (for defining problem classes), LOINC for observations, and RxNorm for medications (Buchanan 2017) (Willett et al 2018). Physicians at the University of Wisconsin and University of Texas-Southwestern have developed Problem Concept Maps that will be available for free download under a LOINC-like agreement. 125 SNOMED CT groupers published as online supplement to open-access article above in reference #3. https://www.thieme-connect.de/media/10.1055-s-00035026/201803/supmat/10-1055-s-0038-1668090-s180031ra.pdf
See Problem List MD at https://problemlist.org”
Semantic interoperability requires standardization and industry consensus around information models (including meta-data) and associated terminologies

**Recommendations:**

A relevant activity, Problem List MD (Meta Data) ([https://problemlist.org/](https://problemlist.org/)), relates problems/diagnoses to relevant tests and current treatments ([https://www.ncbi.nlm.nih.gov/pmc/article\/PMC5373762/](https://www.ncbi.nlm.nih.gov/pmc/article\/PMC5373762/)) and has been created in collaboration with specialty experts. This approach could serve as a foundation for more targeted resources needed for use cases such as referrals. Perhaps more importantly, it shows how clinical groups can be engaged for defining a relevant set of data for important use cases.
Christine Sinsky, MD is Vice President of Professional Satisfaction at the American Medical Association. A board-certified internist, she practiced at Medical Associates Clinic in Dubuque, Iowa for 32 years. Dr. Sinsky is also a member of the Board of Trustees of the ABIM Foundation, serving as Chair from 2018-2020.
Dr. Sinsky’s Comments do not Represent the Official Views of the AMA
Use Cases for Problem Concept Maps

1. Organize data around Problem List *within an EHR*
2. Utilize along with NLP *to assign structure and meaning to unstructured text*
3. **Interoperability, use with FHIR**
   - Problem Concept Maps will be usable through FHIR to assist with data summarization *between EHRs*
4. Smart (parsed) CCD
   - CCD is a known pain point
5. **Organize the data seen in patient portal**
6. Organize data around chief complaint
7. Starting point for creation of quality metrics
8. Use for analytics
9. Provide links from problem list to clinical documentation
10. Augmentation of search
11. Starting point for researchers
12. And others
Future Work

• Build more maps (We welcome contact by interested Subject Matter Experts).

• Add Problem Oriented View functionality to the EHRs of as many vendors as possible. We welcome contact with customers of Cerner, Epic, eClinicalWorks, Meditech, Athena, Allscripts, and others or direct contact with the vendors.

• Add Problem Oriented View-FHIR functionality to the EHRs of as many vendors as possible, so that outside data can be pulled into the EHR used by the provider caring for the patient.

• Build API for provision of problem concept maps.
See More Information at https://problemlist.org
Questions

• Joel Buchanan  jbuchanan@uwhealth.org
  Adam Wright  adam.wright@vumc.org

• Thank you for completing your online session evaluations!