Why Am I Taking This Drug?
Incorporating Indications in CPOE

Session 241, March 8, 2018
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Associate Professor of Medicine, Harvard Medical School
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Conflict of Interest

Gordon Schiff, MD
Pamela Neri Garabedian, MS

No real or apparent conflicts of interest to report.

Indications Project Funded by U.S. Agency for Healthcare Research and Quality AHRQ HIT Safety Grant HS23694
Agenda

• Background & rationale - Brigham AHRQ Indications Rx project
• Summarize activities and findings from project aims 1-3
• Demonstrate BWH prototype
• Results of prototype testing
  – Comparisons with Epic and Cerner
• Next steps
  – How might “indications first” be incorporated into EMR?
  – How can we move forward with this?
Learning Objectives

• Demonstrate importance of incorporating indications into medication order

• Describe the user-centered design process involved in creating an indications-driven CPOE system

• Evaluate the design of an indications-based prescribing prototype

• Compare the results of two different approaches taken to prescribing workflow
Project Participants

Principal Investigator
• Gordon Schiff, MD

Outside Panel Leads
• David Bates, MD, MSc
• Adam Landman, MD, MS, MIS, MHS
• Michael Cohen, RPh, MS
• Frank Federico, RPh
• Bill Galanter, MD, PhD
• Ross Koppel, PhD
• Bruce Lambert, PhD
• Lucian Leape, MD
• Joel Lexchin, MD
• Aziz Sheikh, MD
• Christine Sinsky, MD

Brigham Project Team
• Adam Wright, PhD
• Tewodros Eguale, MD, PhD
• Mary Amato, PharmD, MPH
• John Fanikos, RPh, MBA
• Enrique Seoane-Vazquez, PhD
• Rosa Rodriguez-Monguio, PhD
• Pamela Neri Garabedian, MS
• Alejandra Salazar, RPh, PharmD
• Sarah McCord, MLIS
• Lynn A. Volk, MHS
• Aaron Nathan, BS
• Kevin Kron, BS
• Sara Myers, BS
• Katherine Forsythe, BA
• Isabella Newbury
Overall AHRQ Project Aim

“To improve prescribing safety by redesigning medication computerized prescriber order entry (CPOE) by incorporating the medication indication into the prescription order.”
Why Indications-Based Prescribing Is the Missing Link

• Prescribing is a critical decision in patient care

• Indication is the link between patient’s health problem and the drug
Recommendations to Enhance Accuracy of Prescription Writing

The Council recommends:

1. ...all prescription documents be legible. Verbal orders should be minimized. (See the Council's Recommendations to Reduce Medication Errors Associated with Verbal Medication Orders and Prescriptions)

2. ...prescription orders include a brief notation of purpose (e.g., for cough), unless considered inappropriate by the prescriber. Notation of purpose can help further assure that the proper medication is dispensed and creates an extra safety check in the process of prescribing and dispensing a medication. The Council does recognize, however, that certain medications and disease states may warrant maintaining confidentiality.

3. ...all prescription orders be written in the metric system except for therapies that use standard units such as insulin, vitamins, etc. Units should be spelled out rather than writing "U." The change to the use of the metric system from the archaic apothecary and avoirdupois systems will help avoid misinterpretations of these abbreviations and symbols, and miscalculations when converting to metric, which is used in product labeling and package inserts.

http://www.nccmerp.org/council/council1996-09-04.html
Medication Indication on the Prescription (Resolution No. 100-7-04) (2004 100th Annual Mtg)

Whereas, states do not currently require indication, purpose, or diagnosis be included on the prescription, patient labels or containers; and

Whereas, the lack of this essential patient care information impedes the delivery of pharmaceutical care and can contribute to the incidence of medication errors; and

Whereas, a number of prescription drugs have more than one possible indicated use and look-alike and sound-alike prescription medication names potentially endanger patient safety because such prescription medications are often confused, resulting in medication errors and their consequent harm to patients; and

Whereas, studies have indicated that a pharmacist performing patient counseling as a component of medication management is one of the best protections to prevent medication errors from reaching a patient and a pharmacist, in providing patient counseling, would be greatly benefited by knowing the indicated use of a prescription medication, thus resulting in improved patient counseling and a safer dispensing of prescription drugs;

THEREFORE BE IT RESOLVED that NABP encourage national and state medical associations and other interested parties to support legislative and regulatory efforts in the states to require prescribers to include the indication for the medication on all prescriptions and medication orders issued orally, in writing, or transmitted electronically.
Add the following:

**PRESCRIPTION CONTAINER LABELING**

**INTRODUCTION**

Medication misuse has resulted in more than 1 million adverse drug events per year in the United States. Patients’ best source (and often only source) of information regarding the medications they have been prescribed is on the prescription container label. Although other written information and oral counseling sometimes may be available, the prescription container label must fulfill the professional obligations of the prescriber and pharmacist. These obligations include giving the patient the most essential information needed to understand how to safely and appropriately use the medication and to adhere to the prescribed medication regimen.

Inadequate understanding of prescription directions for use and auxiliary information on dispensed containers is widespread. Studies have found that 46% of patients misunderstood one or more dosage instructions, and 56% misunderstood one or more auxiliary warnings. The problem of misunderstanding is particularly troublesome in patients with low or marginal literacy and in patients receiving multiple medications that are scheduled for administration using unnecessarily complex, nonstandardized time periods. In one study, patients with low literacy were 34 times more likely to misinterpret prescription medication warning labels. Patients may also mistake labels with similar sounds (e.g., “for high blood pressure” rather than “for hypertension”).

**Include purpose for use:** If the purpose of the medication is included on the prescription, it should be included on the prescription container label unless the patient prefers that it not appear. Always ask patients their preference when prescriptions are submitted for filling. Confidentiality and FDA approval for intended use (e.g., labeled vs. off-label use) may limit inclusion of the purpose on labels. Current evidence supports inclusion of purpose-for-use language in clear, simple terms (e.g., “for high blood pressure” rather than “for hypertension”).

Simplify language: “Language on the label should be clear, simplified, concise, and familiar, and should be used in a standardized manner. Only common terms and sentences should be used. Do not use unfamiliar words (including Latin terms) or medical jargon.”
3 Year Project Specific Aims

1. Convene 6 stakeholder expert panels on rationale, multi-user needs, operational and interoperability requirements, interface design elements, limitations and barriers, and policy implications of incorporating indication into CPOE; publication of Sounding Board and White Paper

2. Build working prototype indications-enabled CPOE using user-centered design incorporating Aim 1 recommendations

3. Formally test and compare prototype to two widely deployed CPOE systems using use-case clinical scenarios re: ordering speed, error rate, user experience/satisfaction, plus usefulness and safety of the prescriptions generated for pharmacists and patients
### Participating Stakeholders’ Organizations

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## Participating Stakeholders’ Organizations

| The Joint Commission                       | University of Illinois - Chicago                       |
| The Lynx Group                             | University of Maryland                                   |
| The Medical Letter                         | University of Massachusetts Memorial Medical Center   |
| The PSO Advisory                           | University of Minnesota                                  |
| The University of Alcala de Henares        | University of Pennsylvania                                |
| The University of Illinois at Chicago      | University of Sydney                                      |
| Truven Health Analytics                    | University of Washington                                   |
| Tufts Medical Center                       | US Public Health Service                                   |
| UCL School of Pharmacy, London             | Vanderbilt University                                        |
| UIC College of Pharmacy                    | Veterans Affairs                                           |
| UNC School of Pharmacy                     | Veterans’ Association                                       |
| Uniformed Services University of the Health Sciences (USUHS) | Walgreens                                                   |
| United States Pharmacopeia (USP)           | Walmart                                                   |
| Universite Catholique de Louvain          | Weil Cornell Medical College                              |
| Université Laval                           | Wisconsin Department of Health Services                  |
| University of Alabama at Birmingham        | Wolters Kluwer                                             |
| University of Arizona College of Pharmacy  | Wolters Kluwer, Clinical Drug Information                |
| University of British Columbia (UBC)       | Yale University                                            |
| University of California Los Angeles (UCLA)| York University, Toronto                                   |
| University of Colorado                     | Zynx                                                       |
| University of Connecticut                  |                                                            |
| University of Edinburgh                    |                                                            |
Incorporating Indications into Medication Ordering — Time to Enter the Age of Reason

Gordon D. Schiff, M.D., Enrique Seoane-Vazquez, Ph.D., and Adam Wright, Ph.D.

An 1833 article in the Boston Medical and Surgical Journal (forerunner of the New England Journal of Medicine) explained why prescriptions should be written in Latin to protect patients from knowledge of the names of and indications for the prescribed drugs:

“The question is often asked, why physicians do not write . . . prescriptions in English. The answer is obvious — that if they did, the patient would often be less benefited than he now is. There are very few minds which have sufficient firmness, during the continuance of disease, to reason calmly on the probable effects of remedies, and to compare their wonted action . . . with the indication to be fulfilled in the particular case. . . . The only state in which the mind can rest . . . during severe illness, is that of implicit reliance in the

add to each prescription an ingredient that’s currently conspicuously missing: the right indication. This pivotal element affects and complements the other five, and considering it a sixth “right” would inform and enhance the safety of each prescription. With most prescriptions now being written electronically, this addition is particularly timely, since electronic medication ordering provides the vehicle for incorporating the indication into prescribing — and is handicapped in various ways without it.

Indications-based prescribing can contribute to better prescribing and medication use in multiple, synergistic ways (see table). First, when medication choices are narrowed to those indicated for a specific problem, decisions are much less prone to error. Staff and patients will be able to more easily recognize any misreason each medication is being prescribed. Having this knowledge has been shown to be associated with better adherence and fewer errors, yet patients often do not know the indications for some or all of their medications. Pharmacists, visiting nurses, and caregiving relatives also need this information, but they are often even more in the dark about the reason for a given prescription. Presented with a choice, most patients prefer instructional leaflets and prescription labels that include indications to those that don’t include indications. Knowledge of the indication can also empower patients to question the necessity of a medication.

Third, prescribers need and want help choosing the best drugs for their patients’ problems. Busy clinicians may not have time to look up recommended choices whenever they
Indications-based Prescribing Major Links to 4 AHRQ HIT Safety Emphasis Aims, Central to Key Functions

Policy to impact decisions on the safe use clinical HIT

User-centered design, human factors principles applied to HIT safety

Use HIT socio-technical systems to improve safety

Design, implement usable safe HIT for all users, including patients
We used to sell cigarettes in hospitals. 5 practices that may soon look just as outdated

BY MELISSA BAILEY / OCTOBER 21, 2016
Leave what a drug treats off prescription labels?

Patients get confused about medicine all the time, said Dr. Gordon Schiff of Brigham and Women’s Hospital in Boston. One of his patients recently told him she had stopped taking her medicine for depression. “She happened to have her bottles with her;” he said. “It turns out the medicine she actually stopped was for diabetes” — which sent her blood sugar out of control.

Schiff, a primary care doctor and patient safety researcher, said it’s crazy that we don’t put labels on medicine bottles saying what the drug is for. That’s really confusing for patients — especially elderly patients who are juggling lots of prescriptions.

So why doesn’t the label say what the drug is for? Schiff said it is possible for doctors to write the information into electronic records, but it’s not easy, and the pharmacy may not print it on the label. He’s now leading a project that attempts to change that.
Questions to ask before you take your medicine:

1. Why am I taking this medicine? 
   
2. What are the brand name and generic* name of this medicine? 
   
3. Can I take a generic version of this medicine? 
   
4. Does this new prescription mean I should stop taking other medicines?
Label Preferences: Do Patients Want Indications?

Design and test of preference for a new prescription medication label


Amir H. Zargarzadeh, Anandi V. Law

- Study of 444 patients, 115 pharmacists, 69 physicians
- Experimental labels A and B include: indications, time table for administration, warnings
- Labels D and E are traditional labels
- All 3 groups significantly preferred label B
- 27.9% of patients stated indications as their favorite advantage to the new labels
## Label Preferences: Do Patients Want Indications?

<table>
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<tr>
<th>Survey Question</th>
<th>Answers</th>
<th>Number of Respondents (Percent)</th>
<th>( P ) value</th>
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<tr>
<td><strong>Would Indication labeling be useful to you?</strong></td>
<td>Yes</td>
<td>198 (58)</td>
<td>&lt;0.001</td>
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<tr>
<td></td>
<td>Prob.</td>
<td>82 (24)</td>
<td></td>
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<tr>
<td></td>
<td>No</td>
<td>10 (3)</td>
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<tr>
<td><strong>Pre-intervention</strong></td>
<td></td>
<td>309 (82)</td>
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<tr>
<td><strong>Post-intervention</strong></td>
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<td>51 (13)</td>
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<td></td>
<td></td>
<td>2 (1)</td>
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<tr>
<td><strong>Would you like the indication on all prescriptions?</strong></td>
<td>Yes</td>
<td>265 (77)</td>
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<td></td>
<td>Do Not Care</td>
<td>65 (19)</td>
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<td></td>
<td>No</td>
<td>13 (4)</td>
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<td><strong>Pre-intervention</strong></td>
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<td>358 (94)</td>
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<td><strong>Post-intervention</strong></td>
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<td>16 (4)</td>
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<td>3 (1)</td>
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*Results from 1,000 surveys sent, 500 pre-implementation, and 500 post-implementation of adding the indication to the prescription label.*

*Number of respondents with corresponding answer.*

*In parentheses are the percentages of respondents with that answer to the particular question.*

(Burnside et al. *J Am Pharm Assoc.* 2007)
Knowing Medication Indication Would Prevent These Errors*

- Rapamune (immunosuppressant) vs. Rapaflo (BPH). Consequence: organ rejection or progressive BPH
- Risperidone (schizophrenia, bipolar disorder) vs. Ropinirole (PD, RLS). Consequence: worsening of symptoms
- Tramadol (pain) vs. Trazodone (depression). Consequence: no pain relief or increase depressive mood
- Lamotrigine (epilepsy) vs. Lamivudine (HBV or HIV). Consequences: seizure or liver failure/AIDS (lamivudine indications are dose dependent)
- Prozac (depression) vs. Prograf (transplant rejection). Consequence: organ rejection or worsening of depression

*ISMP List of Confused Drug Names - ISMP National Medication Error Reporting Program
Knowing Medication Indication Would Prevent These Errors

- Brilinta (antiplatelet) vs. Brintellix (antidepressant). Consequence: bleeding risk or worsening of depression
- Chlorpromazine (schizophrenia) vs. Chlorpropamide (DM). Consequence: delusional/hallucinating symptoms or hyperglycemia
- Jantoven (anticoagulant) vs. Januvia (DM). Consequences: bleeding risk or hyperglycemia
- Keppra (epilepsy) vs. Keflex (infection). Consequences: seizure or worsening of infection
- Sulfasalazine (UC, RA) vs. Sufadiazine (infection). Consequence: disease flare/progression or antibiotic resistance/worsening infection

*ISMP List of Confused Drug Names - ISMP National Medication Error Reporting Program
Can drug indications be used to discriminate between LASA drugs?

- Study done in collaboration with a commercial drug knowledgebase vendor
- Compared high-level indications for commonly confused drug pairs
- Of 281 eligible LASA drug pairs (456 unique drugs)
  - 168 (60%) had no overlap in indications
  - 58 (21%) had partial overlap in indications
  - 55 (20%) had complete overlap in indications
    - Half were drugs with the same active ingredient and route of administration (e.g., Adderall, Adderall XR)
### Ciprofloxacin HCl (CIPRO) 500 MG Tablet

**Reference Link:** CIPROFLOXACIN 500 MG TABLET

**Sig Method:** Specify Dose, Route, Frequency

**Dose:**
- **Prescribed Dose:** 500 mg
- **Prescribed Amount:** 1 tablet

**Route:** Oral

**Frequency:** 2 times daily (BID)

**Duration:**
- **Starting:** 10/2/2015
- **Ending:**

**Mark long-term:**
- **CIPROFLOXACIN HCL**

**Patient Sig:**
- Take 1 tablet (500 mg total) by mouth 2 (two) times a day.

**Dispense:**
- **6** tablets

**Class:** Normal

**Dispense As Written:**

**Notes to Pharmacy (P5):**
- (300 char max)

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<td>Chronic Maxillary Moraxella Catarrhalis Infection with Bacterial Exacerbation</td>
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Details for **metoprolol (metoprolol succinate 100 mg oral tablet, extended release)**

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<tr>
<th>Details</th>
<th>Order Comments</th>
<th>Diagnoses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dose</td>
<td>*Route of Administration</td>
<td>*Frequency</td>
</tr>
<tr>
<td>1 tab</td>
<td>PO</td>
<td>DAILY</td>
</tr>
</tbody>
</table>

- **Dosage Form:** ER TABLET
- **Special Instructions:** SPECIAL INSTRUCTIONS
- **Effective Date:** 01/11/2018
- **Stop Date/Time:** 
- **Select Prescriber Address:** Medicine 1801 W. Taylor St...
- **Print DEA Number:** Yes  No

**Indication:**

- **Type Of Therapy:** Acute  Maintenance
- **DAWP:** Yes  No
- **Print Education Leaflet:**
- **eRx Note to Pharmacy:** eRx Note to Pharmacy; This is for HTN;
Policy to impact decisions on the safe use clinical HIT

Use HIT socio-technical systems to improve safety

User-centered design, human factors principles applied to HIT safety

Design, implement usable safe HIT for all users, including patients
Clinician Perspective

• “Don’t tell me what to do”
  – I don’t want anyone taking away my clinical autonomy; especially someone who doesn’t know my patient, or what is best for him or her like I do.

• “Just tell me what to do”
  – I am so frustrated with all the hassles and back and forth faxes and calls with formulary/nonformulary, prior authorization, multitiered co-payment, that….just tell me what to do and I will do it so I can move on to my next patient and work.
Old Paradigm

Drug
Old Paradigm

Drug → You Must Add an Indication → Dx/Indication
New Paradigm

Drug

You Must Add an Indication

Dx/Indication

Flexibly Suggests

Dx/Indication

Drug of Choice

Drug
New Paradigm

You *Must Add an Indication*

Flexibly *Suggests Drug of Choice*

Drug

Dx/Indication

Dx/Indication

Drug
User Centered Design

- Contextual Interview
- Participatory Design Sessions
- Usability Roundtables
- Formative ‘think aloud’ usability testing
Demo

http://indicationsrx.partners.org/
Methods

- Conducted 32 in-person usability tests with prototype CPOE system and commercial vendors
  - Cerner:
    - Tests done at University of Illinois - Chicago
    - October 2017
  - Epic:
    - Tests done at Brigham and Women’s Hospital in Boston
    - May - June 2017
Methods

• Each usability testing session lasted 40-90 minutes
• Participants were given a brief training on the prototype and time to explore
• Participants worked through 8 clinical scenarios with the IndRx Prototype and Epic or Cerner
  – The task was to review the patients history and order an appropriate medication including the indication for the pharmacist and patient
  – The order of the tasks and systems was alternated to avoid bias
• A usability specialist observed, moderated and recorded the session
  – Morae software was used to capture data including time and clicks
• Participants responded to the Single Ease Question (SEQ) after they completed each task and the System Usability Scale (SUS) for the prototype at the end of the test
## Participant Characteristics

<table>
<thead>
<tr>
<th>Clinical Role</th>
<th># of Participants (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>MD attending</td>
<td>17 (53%)</td>
</tr>
<tr>
<td>PA</td>
<td>2 (6%)</td>
</tr>
<tr>
<td>Resident (2nd, 3rd, or 4th year)</td>
<td>13 (41%)</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>32</strong></td>
</tr>
</tbody>
</table>

### Level of skill with technology

<table>
<thead>
<tr>
<th>Skill Level</th>
<th># of Participants (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Novice</td>
<td>1 (3%)</td>
</tr>
<tr>
<td>2. Novice-Intermediate</td>
<td>2 (6%)</td>
</tr>
<tr>
<td>3. Intermediate</td>
<td>15 (47%)</td>
</tr>
<tr>
<td>4. Intermediate-Expert</td>
<td>5 (16%)</td>
</tr>
<tr>
<td>5. Expert</td>
<td>6 (19%)</td>
</tr>
</tbody>
</table>

| Total                              | 32                    |

### Time Using Current System

<table>
<thead>
<tr>
<th>Vendor</th>
<th>&lt;2 years</th>
<th>2 years</th>
<th>&gt;2 years</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>4 (33%)</td>
<td>14 (70%)</td>
<td>2 (10%)</td>
<td>20</td>
</tr>
<tr>
<td>2</td>
<td>&lt; 5 years</td>
<td>5-10 years</td>
<td>11-15 years</td>
<td>12</td>
</tr>
</tbody>
</table>
Results

Mean time on task

- Migraine
- Gout
- Gonorrhea
- H. Pylori
- Hypertension
- Diabetes
- Restless Legs
- Itching

Prototype, Vendor 1, Vendor 2
Results

Median # of clicks per task

Migraine  Gout  Gonorrhea  H. Pylori  Hypertension  Diabetes  Restless Legs  Itching

Prototype  Vendor 1  Vendor 2
Results

Access to outside reference source

% of Participants

Migraine  Gout  Gonorrhea  H. Pylori  Hypertension  Diabetes  Restless Legs  Itching

- Prototype
- Vendor 1
- Vendor 2
Results

Independent pharmacist review of order details revealed:

- 5% of orders made in the **prototype** ‘failed’ to be appropriate for the patient and indication

- 39% of orders made in **vendor 1** ‘failed’ to be appropriate for the patient and indication

- 15% of orders made in **vendor 2** ‘failed’ to be appropriate for the patient and indication

- <1% of orders had an LASA error in the prototype, 2.5% in vendor 1 and 2% in vendor 2
Reasons for failure include:

<table>
<thead>
<tr>
<th>Reason</th>
<th>Issue</th>
</tr>
</thead>
<tbody>
<tr>
<td>Missing Ceftriaxone as part of therapy for Gonorrhea</td>
<td>Incorrect Route</td>
</tr>
<tr>
<td>Missing PPI as part of therapy for h. pylori</td>
<td>Incorrect frequency</td>
</tr>
<tr>
<td>Drug for treatment of Migraine not for prevention</td>
<td>Incorrect duration</td>
</tr>
<tr>
<td>Capsule strength not available</td>
<td>Disease-drug interaction</td>
</tr>
<tr>
<td>Renal function not recommended</td>
<td>LASA error</td>
</tr>
<tr>
<td>Drug-drug interaction</td>
<td>Incorrect dose</td>
</tr>
<tr>
<td>Dosing Instructions incorrect</td>
<td>Drug-allergy interaction</td>
</tr>
<tr>
<td>Conflicting sig instructions</td>
<td></td>
</tr>
</tbody>
</table>
## Results

<table>
<thead>
<tr>
<th>Task Success:</th>
<th>% of order sets that successfully included indication with prescription for patient and pharmacist</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prototype</td>
<td>100%</td>
</tr>
<tr>
<td>Vendor 1</td>
<td>61%</td>
</tr>
<tr>
<td>Vendor 2</td>
<td>62% (electronic prescriptions) 83% (printed prescriptions)</td>
</tr>
</tbody>
</table>
Results

Single Ease Question (SEQ)
Overall, how difficult or easy was the task to complete?

1=Very Easy, 7=Very Difficult
## Results

### Post Survey Results (System Usability Scale)

(1= Strongly Disagree, 5= Strongly Agree)

<table>
<thead>
<tr>
<th>Statement</th>
<th>Mean Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>I think that I would like to use this system frequently.</td>
<td>4.72</td>
</tr>
<tr>
<td>I found the system unnecessarily complex.</td>
<td>1.38</td>
</tr>
<tr>
<td>I thought the system was easy to use.</td>
<td>4.84</td>
</tr>
<tr>
<td>I think that I would need the support of a technical person to be able to use this system.</td>
<td>1.47</td>
</tr>
<tr>
<td>I found the various functions in this system were well integrated</td>
<td>4.59</td>
</tr>
<tr>
<td>I thought there was too much inconsistency in this system</td>
<td>1.38</td>
</tr>
<tr>
<td>I imagine that most people would learn to use this system very quickly</td>
<td>4.66</td>
</tr>
<tr>
<td>I found the system very cumbersome to use.</td>
<td>1.19</td>
</tr>
<tr>
<td>I felt very confident using the system.</td>
<td>4.34</td>
</tr>
<tr>
<td>I needed to learn a lot of things before I could get going with this system.</td>
<td>1.63</td>
</tr>
</tbody>
</table>

**89.69 Average SUS Score**
# Interview Feedback

## Likes:

- User interface is clean, intelligently designed, uncluttered, intuitive, friendly and easier to use
- Starting with the problem and getting color-coded drug suggestions that consider patient allergies, contraindications, renal status etc.
- Easy search by problem or drug
- Indication automatically included without extra steps
- Default dosing based on indication
- Incorporates cost and insurance information in recommendations
- All the information is organized and in one place
- Less clunky, less clicks, faster
- Multi-drug regimens grouped to order
# Interview Feedback

## Dislikes:

- Pop-up menus don’t allow you to complete your order while looking at other information
- Nervousness about ordering a drug by mistake (not signing) or being complacent (relying too much on the system)
- Need more information, more transparency for why drugs were recommended or not
- Some recommendations didn’t match up with expectations
- Needs to be integrated with an EMR to be useful
- Need to build trust in the system
- Lab value display needs work – trending and better organization
- Medication list needs complete history
## Interview Feedback

**Recommendations for enhancements:**

<table>
<thead>
<tr>
<th>Recommendation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Should allow you to view and write notes at the same time as ordering</td>
</tr>
<tr>
<td>Clearly state that dosing is default for indication/suggestions for renal dosing</td>
</tr>
<tr>
<td>Show entire medication list (active/inactive meds) and history persistently on the screen (not a pop up menu)</td>
</tr>
<tr>
<td>Allergies should be more prominent</td>
</tr>
<tr>
<td>Specialized enhancements for order details for different types of drugs (opioids, titrate, doses over time, compound medicine, dosing parameters)</td>
</tr>
</tbody>
</table>
Interview Feedback

**Impact on patient safety:**

- Pre-screened medications safer than pop-up warnings alone
- Generally safer to have indication, less errors in dosing, allows pharmacists to double check
- Good to have for patient education
- Worry physicians would become complacent and rely too much on the system/go too fast

**Easy/difficult to add indication:**

- It was very easy; it was automatic
- It is much easier than current system
## Interview Feedback

**Recommend to colleagues:**

- Yes – saves time, less room for error, easy to use
- Potentially, with modifications

**Prefer over current system:**

- Yes, if integrated well with rest of EHR
- Yes, for outpatient setting
- Yes, once trust is built
- Yes
Interview Feedback

“Visually simpler. Pull up a problem and pick treatment or prevention. Feels intimidating to prescribe medication usually, but the simpler usability makes it more helpful…more reassured. Clinically more challenging in [current system].”

“Leap of faith, how much trust in the tool vs. outside sources.”

“You talked to me about this great thing - are you going to roll it out soon?

“Huge [impact on] patient safety and education. Tells you what the medication is for and if it was on the bottle the patients can be more educated. Less dosing errors in the new system.”
## Minnesota Preliminary Results

<table>
<thead>
<tr>
<th></th>
<th># Eligible Patients Approached</th>
<th># Eligible Patients Consented</th>
<th># Patients Interviewed</th>
<th>Average # Total Meds per Patient</th>
<th>Average # New or Changed Meds per Patient</th>
<th>% New or Changed Meds with Indications</th>
</tr>
</thead>
<tbody>
<tr>
<td>MINN</td>
<td>21</td>
<td>20</td>
<td>20</td>
<td>9.2</td>
<td>4.5</td>
<td>95%</td>
</tr>
</tbody>
</table>
Minnesota Preliminary Data

Knowledge of New or Changed Medication Indications

- Knew Immediately
- Knew Only After Looking at Label/Discharge List
Next Steps

• Publication/dissemination of results
  – Comparison trial (prototype vs. current systems)
  – Other studies (5) (patient, pharmacist, Northwestern study)
• Meetings with Epic, Cerner, other vendors/stakeholders
• New study with Univ. Minnesota
• Additional IT development?
• Developing the information/content to populate
  – Especially “Drugs of Choice” – Who is convener / owner
Questions

• Gordon Schiff
  • E-mail: gschiff@bwh.harvard.edu
• Pamela Neri
  • E-mail: pmneri@partners.org

• Please complete the online session evaluation!
Select Patient

Order by Problem:

Active Problems:
- Migraine Headaches
- HIV Disease
- Insomnia

Inactive Problems:
- Gonorrhea
- Cough
- Acne

No selected problem

Quick reference
- Name: Mark Harris
- Gender: M
- DoB: May 31, 1956
- Age: 31
- Race: Caucasian
- Insurance: MassHealth
- eGFR: > 60 ml/min
- Allergies:
  - Codeine (Slurred and angioedema)
  - Amitriptyline (Dizziness)

Problem List
Medication List
Allergies
Current Vitals
Visit Notes
Labs
Patient's Active Migraine Headaches Drugs:

<table>
<thead>
<tr>
<th>Drug</th>
<th>Started</th>
<th>Actions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Naproxen (Aleve, Naprosyn)</td>
<td>12/01/2014</td>
<td>Refill, Edit, Stop</td>
</tr>
<tr>
<td>Take 1 tablet (220 mg) by mouth twice daily.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Patient's Inactive Migraine Headaches Drugs:

<table>
<thead>
<tr>
<th>Drug</th>
<th>Dates Taken</th>
<th>Reason Stopped</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amitriptyline (Elavil)</td>
<td>12/01/2014 - 01/01/2015</td>
<td>Patient didn't tolerate headache prevention take 1 tablet (25 mg) by mouth once.</td>
</tr>
</tbody>
</table>

Patient's Problem List:

- Migraine Headaches
- HIV Disease
- Insomnia

Pharmacologic Options:

- Deep muscle relaxation
- Biofeedback
- Cognitive-behavioral therapy
- Transtraining
- Transcutaneous electrical nerve stimulation
**Patient's Active Migraine Headaches Drugs:**

<table>
<thead>
<tr>
<th>Drug</th>
<th>Started</th>
<th>Actions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Naproxen (Aleve, Naprosyn)</td>
<td>12/01/2014</td>
<td>Refill, Edit, Stop</td>
</tr>
<tr>
<td>Take 1 tablet (220 mg) by mouth twice daily.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Patient's Inactive Migraine Headaches Drugs:**

<table>
<thead>
<tr>
<th>Drug</th>
<th>Dates Taken</th>
<th>Reason Stopped</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amitriptyline (Elavil)</td>
<td>12/01/2014 - 01/01/2015</td>
<td>Patient didn't tolerate caused dizziness</td>
</tr>
<tr>
<td>To prevent migraine take 1 tablet (25 mg) by mouth once in the evening.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Pharmacologic Options:**
- Biofeedback 
- Relaxation 
- Cognitive-behavioral therapy 
- Acupuncture 
- Transcutaneous electrical nerve stimulation 

**Allergies:**
- Codeine (Hives and angioedema)
- Amitriptyline (Dizziness)
## Patient's Drug Allergies And Intolerances

<table>
<thead>
<tr>
<th>Allergies</th>
<th>Additional Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>Codeine</td>
<td>Hives and angioedema</td>
</tr>
<tr>
<td>Amitriptyline</td>
<td>Dizziness</td>
</tr>
<tr>
<td>Past Adverse Reactions</td>
<td>Additional Information</td>
</tr>
</tbody>
</table>
### Patient's Current Vitals

<table>
<thead>
<tr>
<th>Weight: 145 lbs (as of 04/02/2017)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Height: 5 ft 10 inches (as of 04/02/2017)</td>
</tr>
<tr>
<td>BMI: 20.8 (as of 04/02/2017)</td>
</tr>
<tr>
<td>Blood Pressure: 135/85 mm Hg (02/02/2017); 130/62 mm Hg (03/02/2017); 135/83 mm Hg (as of 04/02/2017)</td>
</tr>
<tr>
<td>Heart Rate: 88 (as of 04/02/2017)</td>
</tr>
</tbody>
</table>
## Patient's Current Labs

### Renal Panel
- **Scr**: 0.86 (range: 0.5-1.1) 2017-04-02
- **eGFR**: > 80 ml/min 2017-04-02
- **Albumin**: 4.5 (range: 3.5-5 G/DL) 2017-04-02
- **Calcium**: 9.5 (range: 8-10.5 mg/DL) 2017-04-02
- **CO2**: 28 (range: 19-29 mmol/L) 2017-04-02
- **Chloride**: 106 (range: 98-110 mmol/L) 2017-04-02
- **Glucose**: 75 (range: 70-100 mg/DL) 2017-04-02
- **Potassium**: 3.9 (range: 3.1-5.3 mmol/L) 2017-04-02
- **Sodium**: 143 (range: 135-145 mmol/L) 2017-04-02
- **Urea Nitrogen -BUN-**: 10 (range: 7.25 mg/DL) 2017-04-02

### Hepatic Function Panel
- **Albumin**: 4.2 (range: 3.5-5 G/DL) 2017-04-02
- **Bilirubin total**: 1.1 (range: 0.3-1.2 MG/DL) 2017-04-02
- **Bilirubin direct**: 0.3 (range: 0-0.4 mg/DL) 2017-04-02
- **Alkaline phosphatase total**: 71 (range: 25-100 U/L) 2017-04-02
- **Protein total**: 7.4 (range: 6.8-8.8 g/DL) 2017-04-02
- **ALT**: 23 (range: 9-67 U/L) 2017-04-02
**Active Problems**

- Migraine Headaches
- HIV Disease
- Insomnia

**Inactive Problems**

- Gonorrhea
- Cough
- Acne

**Active Medications**

Naproxen (Aleve, Naprosyn)

Take 1 tablet (220 mg) by mouth twice daily.
Active Medications
- Ritonavir (Norvir): Take 1 tablet (100 mg) by mouth once daily
- Darunavir (Prezista): Take 1 tablet (800 mg) by mouth once daily
- Emtricitabine and Tenofovir (Truvada): Take 1 tablet (200/300 mg) by mouth once daily
Select Patient

Order by Problem:

Active Problems

- Migraine Headaches
- HIV Disease
- Insomnia

Inactive Problems

- Gonorrhea
- Cough
- Acne

No selected problem

Prevention

Treatment
Suggested Choice:

- **Metoprolol succinate (Toprol-XL)** *Beta blocker*

Alternatives:

- **Beta-Blocker**
- **ACE Inhibitor**
- **Alpha Agonist**
- **Antihistamine**
- **Antidepressant**

Not Recommended:

- **Candesartan (Atacand)** *ACE inhibitor*
- **Carbamazepine (Tegretol)** *ACE inhibitor*
- **Amitriptyline (Elavil)** *Antidepressant*
- **Divalproex Sodium Extended-Release (Depakote ER)**

**Patient’s Active Migraine Headaches Drugs:**

<table>
<thead>
<tr>
<th>Drug</th>
<th>Started</th>
<th>Actions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Naproxen (Aleve, Naprosyn)</td>
<td>12/01/2014</td>
<td>Refill</td>
</tr>
</tbody>
</table>

Take 1 tablet (220 mg) by mouth twice daily.

**Patient’s Inactive Migraine Headaches Drugs:**

<table>
<thead>
<tr>
<th>Drug</th>
<th>Dates Taken</th>
<th>Reason Stopped</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amitriptyline (Elavil)</td>
<td>12/01/2014 - 01/01/2016</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
Migraine Headaches Prevention Drug Order

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

- 2012 Guidelines, Level A evidence (medications with established efficacy)
- Selective beta-blocker
- Covered by insurance, S
- FDA Status: off-label
- Other Factors Considered: Potential DDIs with current medications, past treatment failures, last BPs

**Alternatives:**
- Beta-Blocker [Show Drugs]
- ACE Inhibitor [Show Drugs]
- Alpha Agonist [Show Drugs]
- Antihistamine [Show Drugs]
- Antidepressant [Show Drugs]
Suggested Choice:

- **Metoprolol succinate (Toprol-XL)**

Beta-Blocker

Alternatives:

- Beta-Blocker
  - Atenolol (Tenormin)
  - Nadolol (Corgard)
  - Propranolol Extended-Release (Inderal LA)
  - Timolol (Blocarden)

ACE Inhibitor
### Patient's Active Migraine Headaches Drugs:

<table>
<thead>
<tr>
<th>Drug</th>
<th>Started</th>
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<tbody>
<tr>
<td>Naproxen (Aleve, Naprosyn)</td>
<td>12/01/2014</td>
<td>Refill Edit Stop</td>
</tr>
<tr>
<td>Take 1 tablet (220 mg) by mouth twice daily.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Patient's Inactive Migraine Headaches Drugs:

<table>
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</tr>
<tr>
<td>Headache prevention take 1 tablet (25 mg) by mouth once daily.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Non-Pharmacologic Options:

- Biofeedback
- Relaxation
- Cognitive-behavioral therapy
- Acupuncture
- Transcutaneous electrical nerve stimulation
Not Recommended:

- **Candesartan (Atacand)**: ACE inhibitor
- **Carbamazepine (Tegretol)**: ACE inhibitor
- **Amitriptyline (Elavil)**: Antidepressant
- **Divalproex Sodium Extended-Release (Depakote ER)**
- **Topiramate (Topamax)**

*Caution:* intolerable
- Covered by insurance, $  
- FDA Status: off-label

Show more
Migraine Headaches Prevention Drug Order

**Suggested Choice:**

**Metoprolol succinate (Toprol-XL)**  
*Beta-Blocker*

**Alternatives:**

- Atenolol (Tenormin)
- Nadolol (Corgard)
- Propranolol Extended-Release (Inderal LA)
- Timolol (Blocarden)
- ACE Inhibitor

**Patient’s Active Drugs:**

- Naproxen (Arcoxia)

**Patient’s Inactive Drugs:**

- Amitriptyline

**Non-Pharmacologic Options:**

- Biofeedback
- Relaxation
- Cognitive
- Acupuncture
- Transcutaneous

---

**Patient’s Active Drugs:**

- Naproxen (Arcoxia)

**Patient’s Inactive Drugs:**

- Amitriptyline

**Non-Pharmacologic Options:**

- Biofeedback
- Relaxation
- Cognitive
- Acupuncture
- Transcutaneous
Migraine Headaches Prevention Drug Order

**Suggested Choice:**

Metoprolol succinate (Toprol-XL)
*Beta-Blocker*

**Alternatives:**
- Beta-Blocker
- ACE Inhibitor
- Alpha Agonist
- Antihistamine
- Antidepressant

- 2012 Guidelines: Level A evidence (medications with established efficacy)
- Selective beta-blocker
- Covered by insurance, $
- FDA Status: off-label
- Other Factors Considered: Potential DDIs with current medications, past treatment failures, last BPs
Selected Indication: Migraine Headaches Prevention

Drug #1: Metoprolol succinate (Toprol-XL)

- Strength: 50mg, 25mg, 100mg, 200mg
- Route: Oral
- Frequency: once daily, twice daily
- Prescription Duration: 30 day(s)
- Dispense quantity: 30 Tablet(s)
- # of Refills: 2
- Directions: For Migraine Headaches Prevention take one 50mg tablet(s) by mouth once daily
- Dispense: pharmacy

Dispense information:
- Default Retail Pharmacy: CVS Store #159, 516 Main Street, Melrose, MA 02176, Phone: 1-781-665-7107
- Mail Order Pharmacy: CVS Store #159, 516 Main Street, Melrose, MA 02176, Phone: 1-781-665-7107

Options:
- e-Prescribe
- Print
- Phone-in
Selected Indication: Migraine Headaches Prevention

Drug #1: Metoprolol succinate (Toprol-XL)

- **Strength**: 25mg, 50mg, 100mg, 200mg
- **Route**: Oral
- **Frequency**: once daily, twice daily
- **Prescription Duration**: 30 day(s), 60 day(s), 90 day(s)
- **Dispense quantity**: 30 Tablet(s)
- **# of Refills**: 2

**Directions**: For Migraine Headaches Prevention take one 25mg tablet(s) by mouth once daily.

**Dispense**
- in clinic
- pharmacy
- Dispense as written - do not substitute
- Suppress indication from directions and patient label

**Dispense information**

- **Default Retail Pharmacy**
  - CVS Store #159
  - 516 Main St
  - Melrose, MA 02176
  - Phone: 1-781-665-7107

- **Mail Order Pharmacy**
  - CVS Store #159
  - 516 Main St
  - Melrose, MA 02176

**e-Prescribe**
- **Print**
- **Phone-in**

**View cost**

**Comments to pharmacy**
### Selected Indication: Migraine Headaches Prevention

**Drug #1: Metoprolol succinate (Toprol-XL)**

<table>
<thead>
<tr>
<th>Strength</th>
<th>25mg</th>
<th>25mg</th>
<th>50mg</th>
<th>100mg</th>
<th>200mg</th>
</tr>
</thead>
</table>

**Drug Costs for Mark Hamill**

- **Insurance:** MassHealth

**Drug #1: Metoprolol succinate (Toprol-XL):** For Migraine Headaches Prevention take one 25mg table(s) by mouth once daily.

<table>
<thead>
<tr>
<th>Dispense</th>
<th>Quantity</th>
<th>Copay</th>
<th>Deductible</th>
<th>Prior Auth. Required</th>
<th>PA Form</th>
</tr>
</thead>
<tbody>
<tr>
<td>Retail Pharmacy</td>
<td>30</td>
<td>$15</td>
<td>$0</td>
<td>Y</td>
<td>PA Form</td>
</tr>
</tbody>
</table>

- **Melrose, MA 02176**
  - **Phone:** 1-871-665-7107

- **Melrose, MA 02176**
  - **Phone:** 1-871-665-7107

**Add to Visit Order**
Drugs ordered for Mark Hamill this visit:

1) Metoprolol succinate (Toprol-XL): For Migraine Headaches Prevention take one 25mg tablet(s) by mouth once daily

Submit Drug Order
Select Patient

Order by Problem:

Active Problems
Acne

Inactive Problems
Insomnia

Search problem or drug
Search
Select Patient

Order by Problem:

Active Problems

Acne

Inactive Problems

Insomnia

Search

Gonorrhea
Suggested Choice:

- Ceftriaxone (Rocephin) + Azithromycin (Zithromax)

Alternatives:

- Cefixime (Suprax) + Azithromycin (Zithromax)
- Gemifloxacin (Factive) + Azithromycin (Zithromax)
- Gentamicin (Garamycin) + Azithromycin (Zithromax)

Not Recommended:

- Cefixime (Suprax) + Doxycycline (Vibramycin)
Suggested Choice:
Ceftriaxone (Rocephin) + Azithromycin (Zithromax)
- CDC 2015 treatment guidelines.
- Covered by insurance. $5
- FDA Status: labeled

Alternatives:
Cefixime (Suprax) + Azithromycin (Zithromax)
Gemifloxacin (Factive) + Azithromycin (Zithromax)
Gentamicin (Garamycin) + Azithromycin (Zithromax)

Not Recommended:
Cefixime (Suprax) + Doxycycline (Vibramycin)
Suggested Choice:

- Ceftriaxone (Rocephin) + Azithromycin (Zithromax)

Alternatives:

- Cefixime (Suprax) + Azithromycin (Zithromax)
- Gemifloxacin (Factive) + Azithromycin (Zithromax)
- Gentamicin (Garamycin) + Azithromycin (Zithromax)

Not Recommended:

- Cefixime (Suprax) + Doxycycline (Vibramycin)

---

*Major DDI: Concurrent use of RETINOIDS and TETRACYCLINES may result in an increased risk of benign interstitial pneumonia.*
Drug Order Details

Selected Indication: Gonorrhea Treatment

Drug #1: Ceftriaxone (Rocephin)
- Strength: 250mg
- Route: Intramuscular
- Frequency: once
- Prescription Duration: 1 day(s)
- Dispense Quantity: 1 injection(s)
- # of Refills: 0
- Directions: Reconstitute according to instructions in vial and inject 250mg into the muscle once
- Dispense: in clinic
- Administer: by nurse in clinic
- Substitute: No
- Dispense as written - do not substitute
- Suppress indication from directions and patient label

Drug #2: Azithromycin (Zithromax)
- Strength: 500mg
- Route: Oral
- Frequency: once
- Prescription Duration: 1 day(s)
- View cost
- Comments to pharmacy
Selected Indication: Gonorrhea Treatment

**Drug #1: Ceftriaxone (Rocephin)**
- **Strength:** 250mg, 250mg, 500mg, 1g, 2g
- **Route:** Intramuscular, Intramuscular
- **Frequency:** once, once
- **Prescription Duration:** 1 day(s)
- **Dispense Quantity:** 1 Injection(s)
- **# of Refills:** 0
- **Directions:** for Gonorrhea Treatment reconstitute according to instructions in vial and inject 250mg into the muscle once
- **Dispense:** in clinic, pharmacy
- **Administer:** by nurse in clinic, other
  - Dispense as written - do not substitute
  - Suppress indication from directions and patient label

**Drug #2: Azithromycin (Zithromax)**
- **Strength:** 500mg, 250mg, 600mg, 600mg
- **Route:** Oral, Oral
- **Frequency:** once, once
- **Prescription Duration:** 1 day(s)

[View cost] [Comments to pharmacy]
Drugs ordered for George Clooney this visit:

1) Ceftriaxone (Rocephin): reconstitute according to instructions in vial and inject 250mg into the muscle once
2) Azithromycin (Zithromax); take two 500mg tablet(s) by mouth once

Add Gonorrhea to patient's problem list

Submit Drug Order
Ceftriaxone (Rocephin), Azithromycin (Zithromax) prescription successfully ordered for George Clooney.
Select Patient

Search problem or drug

Order by Problem:

Active Problems
- Acne
- Gonorrhea

Inactive Problems
- Insomnia
Select Patient

Order by Problem:

Active Problems
- Chronic Idiopathic Urticaria
- Asthma
- Type 2 Diabetes Mellitus

Active Medications
No active medications taken

Inactive Problems
Select other indications that apply for this drug:

- Hypertension
- Eclampsia
- Hypertensive Emergency
- Preeclampsia Heart Failure

Enter Other: [Input field]  OK
Search results: Hydroxyzine

Select other indications that apply for this drug:

- Chronic Idiopathic Urticaria
- Anxiety
- Pruritus
- Allergic Rhinitis

Enter Other:  
OK
Select other indications that apply for this drug:

- Chronic Idiopathic Urticaria
- Anxiety
- Pruritus
- Allergic Rhinitis

Enter Other:  

OK
Selected Indications: Chronic Idiopathic Urticaria

Searched Drug (Hydroxyzine)

Hydroxyzine (Atarax)
H1 Blocker

Suggested Choice:

Hydroxyzine (Atarax)
H1 Blocker

Alternatives:

- Antihistamine
- Antiinflammatory
- Tricyclic Antidepressant
Drug Order Details

Selected Indications: Chronic Idiopathic Urticaria

Drug #1: Hydroxyzine (Atarax)

- Strength: 25mg, 10mg, 25mg, 50mg, 100mg
- Route: oral
- Frequency: 3 times daily, twice daily, 3 times daily, 4 times daily
- Prescription: 30 day(s), 30 day(s)
- Dispense quantity: 90 Tablet(s)
- # of Refills: 1

Directions: For Chronic Idiopathic Urticaria Treatment take one 25mg tablet(s) by mouth 3 times daily

Dispense information:
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  - 516 Main Street
  - Melrose, MA 02176
  - Phone: 1-781-666-7107

- e-Prescribe
- Print
- Phone-in

View cost
Comments to pharmacy
Drugs ordered for Isaiah Thomas this visit:

1) Hydroxyzine (Atarax): For Chronic Idiopathic Urticaria. Treatment: take one 25mg tablet(s) by mouth 3 times daily.

Submit Drug Order
Hydroxyzine (Atarax) prescription successfully ordered for Isaiah Thomas.
Select Patient

Order by Problem:

Active Problems
- Chronic Idiopathic Urticaria
- Asthma
- Type 2 Diabetes Mellitus

Inactive Problems

Active Medications
Hydroxyzine (Atarax) take one 25mg tablet(s) by mouth 3 times daily