Guidelines for Safety Enhanced Design

Project Leader: Todd R Johnson
Project Co–Leaders: Yang Gong, Jeff Belden
Motivation

- **Early 2013**
  - Several SHARPC subprojects begin work on guidelines to help vendors improve EHR usability

- **June 2013**
  - Recognized need to coordinate, integrate and cross-link guidelines efforts
  - Todd Johnson named Guidelines Lead
  - Weekly guideline-specific teleconference calls begin

- **Over 25 participants**
Primary Guidelines Products

Safety Enhanced Design Briefs
Making Effective Use of Color

Detailed Usability Guidelines
Yang Gong

Safety Enhanced Design Briefs
Todd Johnson

EHR Style Guide interactive iBook
Jeff Belden
National Center for Cognitive Informatics & Decision Making in Healthcare

Estimating Task Execution Time in EHRs Using the Keystroke-Level Model

Introduction

Results

Although KLM:

- Surprising costs
- Problem List variability
- Compare and
- Optimize execution time
- Collecting data benchmarks for

Research Questions:

- Skilled user performance of in EHRs
- Stepwise linear regression for
- Per-case benchmarks (MCs)
- Comparison of EHRs
- Analyzing time data

Conclusion:

- KLM demonstrated to accurately predict performance time [2, 3].
- Problem List variability assessed.
- EHR performance compared.
- EHRs optimized for efficiency.
Designing for Usability

Interface design in modern health IT has come to mean User-Centered Design (UCD). In this iterative approach to design, the user is a major part of the process from first to last. The product life cycle starts with an understanding of users and their working environment, then proceeds through design, development and evaluation. Designers and engineers don't simply make assumptions about how users are likely to use a product; they use scenarios, create use cases and test their predictions with actual users, with formative assessment techniques.

Today we've moved beyond what might be called product-centered engineering. Today's designers apply the findings of decades of cognitive science, the accumulated knowledge of human factors, ergonomics, and usability methodology. Now the focus is on the people who will use the product in their work, day in and day out, to get the job done effectively, efficiently and with maximum satisfaction.

In this section, we present a number of resources to guide the development of EHRs. Please use the links to the left to review our guidelines, inspirational prototypes, and other ideas about EHR design.

SHARPC has developed several different types of guidelines designed to assist developers in designing EHRs that ease the cognitive work of healthcare providers.

These include:

- General Design Principles & Guidelines;
- Safety Enhanced Design Briefs; and
- A more detailed EHR Style Guide eBook.

What is a guideline?

Guidelines refer to a set of rules or principles by which to set standards or determine a course of action. The rule or
General Design Guidelines

- Provides instructional materials relevant to EHR usability
  - Introduction to EHR usability
  - Applicable usability guidelines aggregated and refined from the existing literature
  - EHR usability testing tool
- Cross link and harmonize with
  - Design Briefs
  - iBook
General Design Principles & Guidelines

A great user interface follows established human interface design principles that are based on the way users (doctors, nurses, patients etc.) think and work. The following are 14 general design principles that can be applied to the development of EHRs:

<table>
<thead>
<tr>
<th>Consistency</th>
<th>Visibility</th>
<th>Match</th>
<th>Minimalism</th>
<th>Memory</th>
<th>Feedback</th>
<th>Flexibility</th>
</tr>
</thead>
<tbody>
<tr>
<td>Error Messages</td>
<td>Prevent Errors</td>
<td>Closure</td>
<td>Undo</td>
<td>Language</td>
<td>Control</td>
<td>Help</td>
</tr>
</tbody>
</table>

1. **Consistency and standards.** Users should not have to wonder whether different words, situations, or actions mean the same thing. Standards and conventions in product design should be followed.

2. **Visibility of system state.** Users should be informed about what is going on with the system through appropriate feedback and display of information.

3. **Match between system and world.** The image of the system perceived by users should match the model the users have about the system.

4. **Minimalist Design.** Any extraneous information is a distraction and a slow-down. Less is more.

5. **Minimize memory load.** Users should not be required to memorize a lot of information to carry out tasks. Memory load reduces users capacity to carry out the main tasks.

6. **Informative feedback.** Users should be given prompt and informative feedback about their actions.
consistent user-system interactions. For example, the data input method and process, as well as corresponding assistant functionalities (e.g., filtering, sorting, and alerting etc.) should be standardized and remain consistent. That uniformity will potentially accelerate operation processes as the user repeatedly interacts with the system. Figure 2 shows an example that goes against this rule.
What is Safety Enhanced Design?

Safety in healthcare is a hot-button topic today, and with good reason. One of the major advantages of electronic health records is their potential to increase patient safety by preventing, detecting and aiding in the recovery from human errors. In order to turn that potential into reality, the ONC has set certification standards for safety-enhanced design (SED), making patient safety a primary focus in the design of an EHR.

Certification requires that designers follow two major steps:

1. Use a formal **User Centered Design (UCD)** process during development
2. Perform **Summative Usability Testing** on specific areas of the product.

UCD procedures have been specified in detail in several ISO standards, listed below. These are not the only acceptable standards, but the point is that a formal UCD procedure must be followed during design and development, and the procedure must be identified or described as part of the certification process.

The essential document to read and follow is [NISTIR 7742 Customized Common Industry Format Template for EHR Usability Testing](https://www.nist.gov/itl/medical-technology/nistir-7742-customized-common-industry-format-template-ehr-usability-testing). It outlines how the ONC requires documentation of the results of summative usability testing.

**The Central Requirement: Summative Testing**

Safety Enhanced Design Briefs

- One page only
- Print and PDF versions
- Target developers at small to medium EHR companies
- Select most critical, actionable, and relevant guidelines
  - Focuses on what is important and possible now
- Distills current theory into practical advice
Safety Enhanced Design Briefs

We welcome your feedback on these guidelines. Please email comments to sharpc@uth.tmc.edu.

General Briefs

<table>
<thead>
<tr>
<th>Brief Code</th>
<th>Brief Title</th>
<th>Format</th>
<th>More Info</th>
</tr>
</thead>
<tbody>
<tr>
<td>SEDB-G01</td>
<td>Making Effective Use of Color</td>
<td>PDF</td>
<td>More Info</td>
</tr>
<tr>
<td>SEDB-G02</td>
<td>Effective Table Design</td>
<td>PDF</td>
<td>More Info</td>
</tr>
<tr>
<td>SEDB-G03</td>
<td>Reducing Wrong Patient Selection Errors</td>
<td>PDF</td>
<td>More Info</td>
</tr>
<tr>
<td>SEDB-MU01</td>
<td>Drug-drug, drug-allergy interaction checks</td>
<td>PDF</td>
<td>More Info</td>
</tr>
<tr>
<td>SEDB-MU02</td>
<td>Medication list</td>
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<td>SEDB-MU03</td>
<td>Medication allergy list</td>
<td>PDF</td>
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<tr>
<td>SEDB-MU04</td>
<td>Clinical decision support</td>
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<tr>
<td>SEDB-MU05</td>
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<tr>
<td>SEDB-MU06</td>
<td>Clinical information reconciliation</td>
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<td></td>
<td>SEBB-MU06.2 Problem reconciliation</td>
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<td></td>
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<td></td>
<td>SEBB-MU06.3 Allergy reconciliation</td>
<td>PDF</td>
<td></td>
</tr>
<tr>
<td>SEDB-MU08</td>
<td>Computerized Practitioner Order Entry</td>
<td>PDF</td>
<td></td>
</tr>
</tbody>
</table>
# Version 1: Making Effective Use of Color

## Tools for Selecting Effective Color Schemes

<table>
<thead>
<tr>
<th>Tool</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Color Brewer 2.0</td>
<td>Web-based tool for selecting appropriate color schemes based on your data type: qualitative (also called categorical), sequential, and diverging. Includes options for color-blind safe schemes.</td>
</tr>
<tr>
<td>Coblis</td>
<td>A color blindness simulator</td>
</tr>
</tbody>
</table>

## Websites

<table>
<thead>
<tr>
<th>Website</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Colblindor</td>
<td>Site for learning more about color-blindness. Includes tests and tools for checking designs (<a href="#">Coblis</a>)</td>
</tr>
<tr>
<td>Perceptual Edge</td>
<td>Stephen Few's website on tools and techniques for visual business intelligence.</td>
</tr>
</tbody>
</table>

## Detailed Information for Selecting Effective Color Schemes

Stephen Few's [Practical Rules for Using Color in Charts](#) is an excellent summary of how to use color effectively and how to avoid common mistakes with color display.
Safety Enhanced Design Brief
Making Effective Use of Color

Carefully used colors can dramatically improve the efficiency and safety of health information systems by drawing attention to important items and making it easier to perceive differences and trends. Incorrectly used colors can make a display hard to use, hard to interpret and misleading.

1. To maximize the communication benefits of color, design
   - Use gray scale, then add color sparingly

2. To group items into different categories
   - Use no more than 7 colors (4 recommended)

3. To show sequential ranges of quantitative values
   - Use 1 color (for sequential) and 2 colors (for diverging) values
   - Vary color intensity from pale (low values) to darker (extreme values)

4. To ensure consistency, learnability, and to prevent misinterpretation, create rules for:
   - Colors for critical values
   - Colors for severity of warnings and alerts, etc.
   - Colors for different categories of items, symbols, icons, positions

5. To ease understanding and learnability of colors
   - Use text, tooltips or legends

6. Use color-blind friendly colors (10% of men and 5% of women are color-blind). Combine color with an image, shape, position, or text to convey same meaning. In prefixes L (low) and H (high) are in separate columns to reinforce color.

7. To select appropriate color schemes, use tools that match schemes to data types and support color-blind safe choices (see http://colorbrewer2.org/) Use tools that preview design as it would be seen by a color blind user (see http://www.color-blindness.com/coblis-color-blindness-simulator/)

Learn more at https://sbmi.luth.edu/nccd/SEDBriefs/sedb-G01.htm

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EHR Style Guide iBook

In partnership with the California HealthCare Foundation, SHARPC is co-funding a project to develop an interactive, illustrated style guide designed to enhance EHR usability by recommending common user interface elements for key features such as:

- The medication list
- Allergy list
- Medication reconciliation
- E-prescribing
- Computerized provider order entry (CPOE)
- Drug interaction and allergy alerts, and
- Clinical decision support

The vendor community will participate in iterative feedback opportunities.

Click [here](#) to see a working prototype of the e-book in HTML5.

Follow this link to find a recorded Webinar, sponsored by the HIMSS HIT Usability Community on November 18, 2013.

Please see an introductory slide deck about the project to the EHRA Clinician Experience Workgroup on October 18, 2013.

The e-book will be publicly available and will be distributed to EHR vendors through the cooperation of their trade organization, the HIMSS EHR Association.

For additional details, contact Jeff Belden, MD.

**Please note:** The content provided here are intended as guidelines (recommended, but not mandatory) for design and implementation, not as standards (mandatory, minimum requirements).
The EHR Usability Style Guide

Emphasizes
- clinical scenarios & examples
- galleries of examples of before & after design makeovers
- interactive widgets for exploratory learning

Released in 2 formats
- iBook (interactive)
- Web (HTML plus interactive prototypes)
Stakeholders

- EHRA Clinician Experience Workgroup
  - Reviewer volunteers
  - Dissemination partner
  - Vendor reps at design workshops

- Core team
  - U of Missouri – Belden, Koopman, Moore
  - U of Maryland – Plaisant
  - Involution Studios (Boston) – Sonin

- Sponsors:
  - SHARP–C
  - California HealthCare Foundation
Overall aims

- Illustrative
- Inspirational
- Interactive
medications. The physician needs to have an overall awareness of the patient's problems and medications (are they taking insulin? Are they on any high-risk drugs like warfarin?). We can call that "situational awareness" of the patient's overall medical picture.

Here's an example:

**Medication List**

- **aspirin 81 mg** 1 tablet daily
- **chlorothalidone 25 mg** 1 tablet daily
- **citalopram 20 mg** 1 tablet daily
- **Lantus 40 units** at bedtime
- **lisinopril 20 mg** 1 tablet daily
- **metformin 1000 mg** 1 tablet 2 times a day
- **metoprolol XL 50 mg** 1 tablet daily
- **naproxen 500 mg** 1 tablet 2 times a day
- **omeprazole 20 mg** 1 tablet daily
- **pravastatin 40 mg** 1 tablet daily
- **trazodone 50 mg** 3 tablets at bedtime
- **warfarin 5 mg** 1 tablet daily on MWF, 1.5 tablets daily SuTuThSa

We can make that easier to read by **emphasizing** the name of the drug, and de-emphasizing everything else. One method is to use gray text that is perceptibly different while still readable.

Use just enough difference to "make it pop".

Alphabetize the list. Why? The human brain would expect a list of text items to be alphabetical, to facilitate finding a particular name quickly in a long list. "Are they taking warfarin?" Just jump to the "w" section. Other views might have different sorting needs. We'll come to that later in this chapter.

### INTERACTIVE 3.1 Interactive Table Medication List

<table>
<thead>
<tr>
<th>Name</th>
<th>Dose</th>
<th>Frequency</th>
<th>Quantity</th>
<th>Refills</th>
<th>Prescribed</th>
<th>Provider</th>
<th>Condition</th>
<th>Condition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aspirin</td>
<td>81 mg</td>
<td>1 tablet daily</td>
<td>75</td>
<td>3</td>
<td>16 Oct 2022</td>
<td>Dr. Mater-R-Lucas</td>
<td>Cardiovascular disease</td>
<td></td>
</tr>
<tr>
<td>Chlorothalidone</td>
<td>25 mg</td>
<td>1 tablet daily</td>
<td>86</td>
<td>5</td>
<td>16 Oct 2023</td>
<td>Dr. Saha-Ranam</td>
<td>Hypertension</td>
<td></td>
</tr>
<tr>
<td>Citalopram</td>
<td>25 mg</td>
<td>1 tablet daily</td>
<td>80</td>
<td>5</td>
<td>16 Oct 2023</td>
<td>Dr. Mater-R-Lucas</td>
<td>Depression</td>
<td></td>
</tr>
<tr>
<td>Lantus</td>
<td>40 units</td>
<td>1 injection at bedtime</td>
<td>100 units</td>
<td>9</td>
<td>20 Oct 2012</td>
<td>Dr. Mater-R-Lucas</td>
<td>Diabetes</td>
<td></td>
</tr>
<tr>
<td>Lisinopril</td>
<td>25 mg</td>
<td>1 tablet daily</td>
<td>80</td>
<td>9</td>
<td>20 Oct 2012</td>
<td>Dr. Mater-R-Lucas</td>
<td>Hypertension</td>
<td></td>
</tr>
<tr>
<td>Metformin</td>
<td>1000 mg</td>
<td>1 tablet daily</td>
<td>80</td>
<td>9</td>
<td>20 Oct 2012</td>
<td>Dr. Mater-R-Lucas</td>
<td>Diabetes</td>
<td></td>
</tr>
<tr>
<td>Metoprolol</td>
<td>XL 50 mg</td>
<td>1 tablet daily</td>
<td>80</td>
<td>9</td>
<td>20 Oct 2012</td>
<td>Dr. Mater-R-Lucas</td>
<td>Hypertension</td>
<td></td>
</tr>
<tr>
<td>Naproxen</td>
<td>500 mg</td>
<td>1 tablet 2 times a day</td>
<td>90</td>
<td>5</td>
<td>20 Oct 2012</td>
<td>Dr. Mater-R-Lucas</td>
<td>Rheumatoid arthritis</td>
<td></td>
</tr>
<tr>
<td>Omeprazole</td>
<td>20 mg</td>
<td>1 tablet daily</td>
<td>75</td>
<td>3</td>
<td>11 July 2023</td>
<td>Dr. Saha-Ranam</td>
<td>Gastroesophageal reflux disease</td>
<td></td>
</tr>
<tr>
<td>Pravastatin</td>
<td>40 mg</td>
<td>1 tablet daily</td>
<td>80</td>
<td>9</td>
<td>7 Aug 2013</td>
<td>Dr. Saha-Ranam</td>
<td>High cholesterol</td>
<td></td>
</tr>
<tr>
<td>Trazodone</td>
<td>50 mg</td>
<td>3 tablets at bedtime</td>
<td>150</td>
<td>5</td>
<td>14 June 2014</td>
<td>Dr. Saha-Ranam</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Trazodone</td>
<td>50 mg</td>
<td>3 tablets at bedtime</td>
<td>150</td>
<td>5</td>
<td>14 June 2014</td>
<td>Dr. Saha-Ranam</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Venlafaxine</td>
<td>150 mg</td>
<td>1 tablet daily</td>
<td>45</td>
<td>3</td>
<td>14 July 2013</td>
<td>Dr. Saha-Ranam</td>
<td>Antidepressant</td>
<td></td>
</tr>
</tbody>
</table>

Tap to open the interactive widget of a patient's medication list you can sort and filter.
Clinical examples

**Medication List**
- aspirin 81 mg 1 tablet daily
- chlorothalidone 25 mg 1 tablet daily
- citalopram 20 mg 1 tablet daily
- Lantus 40 units at bedtime
- lisinopril 20 mg 1 tablet daily
- metformin 1000 mg 1 tablet 2 times a day
- metoprolol XL 50 mg 1 tablet daily
- naproxen 500 mg 1 tablet 2 times a day
- omeprazole 20 mg 1 tablet daily
- pravastatin 40 mg 1 tablet daily
- trazodone 50 mg 3 tablets at bedtime
- warfarin 5 mg 1 tablet daily on MWF, 1.5 tablets daily SuTuThSa

Avoid the temptation to add unneeded and unwanted detail here. Concise lists are easier to read. In this context, the physician doesn’t need to see the quantity or the number of refills or the start dates.

We can make that easier to read by **emphasizing** the name of the drug, and **de-emphasizing** everything else. One method is to use gray text that is perceptibly different while still readable.

Use just enough difference to “make it pop”.

Alphabetize the list. Why? The human brain would expect a list of text items to be alphabetical, to facilitate finding a particular name quickly in a long list. “Are they taking warfarin?” Just jump to the “W” section. Other views might have different sorting needs. We’ll come to that later in this chapter.

**Interactive 3.1 Interactive Table Medication List**

<table>
<thead>
<tr>
<th>Name</th>
<th>Dose</th>
<th>Form</th>
<th>Quantity</th>
<th>Refill</th>
<th>Prescribed</th>
<th>Provider</th>
<th>Condition</th>
</tr>
</thead>
<tbody>
<tr>
<td>aspirin</td>
<td>81 mg</td>
<td>tablet daily</td>
<td>75</td>
<td>3</td>
<td>16 Oct 2012</td>
<td>Dr. Walter Lucas</td>
<td>Cardiac disease</td>
</tr>
<tr>
<td>chlorothalidone</td>
<td>25 mg</td>
<td>tablet daily</td>
<td>10</td>
<td>2</td>
<td>16 Oct 2012</td>
<td>Dr. Saffa Hafez</td>
<td>Hypertension</td>
</tr>
<tr>
<td>citalopram</td>
<td>20 mg</td>
<td>tablet daily</td>
<td>30</td>
<td>0</td>
<td>19 Sept 2012</td>
<td>Dr. Walter Lucas</td>
<td>Depression</td>
</tr>
<tr>
<td>Lantus</td>
<td>40 units</td>
<td>1 injection</td>
<td>120 units</td>
<td>0</td>
<td>26 Sept 2012</td>
<td>Dr. Walter Lucas</td>
<td>Diabetes</td>
</tr>
<tr>
<td>lisinopril</td>
<td>20 mg</td>
<td>tablet daily</td>
<td>30</td>
<td>0</td>
<td>1 Jan 2011</td>
<td>Dr. Walter Lucas</td>
<td>Hypertension</td>
</tr>
<tr>
<td>metformin</td>
<td>1000 mg</td>
<td>tablet daily</td>
<td>30</td>
<td>0</td>
<td>30 June 2012</td>
<td>Dr. Walter Lucas</td>
<td>Diabeties</td>
</tr>
<tr>
<td>metoprolol XL</td>
<td>50 mg</td>
<td>tablet daily</td>
<td>30</td>
<td>0</td>
<td>1 Aug 2011</td>
<td>Dr. Walter Lucas</td>
<td>Hypertension</td>
</tr>
<tr>
<td>naproxen</td>
<td>500 mg</td>
<td>tablet 2 times a day</td>
<td>30</td>
<td>0</td>
<td>30 June 2012</td>
<td>Dr. Walter Lucas</td>
<td>Rheumatoid arthritis</td>
</tr>
<tr>
<td>omeprazole</td>
<td>20 mg</td>
<td>tablet daily</td>
<td>75</td>
<td>0</td>
<td>17 July 2012</td>
<td>Dr. Saffa Hafez</td>
<td>Gastroesophageal reflux</td>
</tr>
<tr>
<td>pravestatin</td>
<td>40 mg</td>
<td>tablet daily</td>
<td>45</td>
<td>0</td>
<td>1 Aug 2011</td>
<td>Dr. Saffa Hafez</td>
<td>High cholesterol</td>
</tr>
<tr>
<td>trazodone</td>
<td>50 mg</td>
<td>tablets at bedtime</td>
<td>180</td>
<td>2</td>
<td>31 June 2012</td>
<td>Dr. Saffa Hafez</td>
<td>Dermatias</td>
</tr>
<tr>
<td>warfarin</td>
<td>5 mg</td>
<td>tablet daily</td>
<td>45</td>
<td>3</td>
<td>14 July 2013</td>
<td>Dr. Saffa Hafez</td>
<td>Thrombosis</td>
</tr>
</tbody>
</table>

Tap to open the interactive widget of a patient’s medication list you can sort and filter.
medications. The physician needs to have an overall awareness of the patients' problems and medications (are they taking insulin? Are they on any high-risk drugs like warfarin?). We can call that “situational awareness” of the patient’s overall medical picture.

Here’s an example:

**Medication List**
- **aspirin 81 mg** 1 tablet daily
- **chlorothalidone 25 mg** 1 tablet daily
- **citalopram 20 mg** 1 tablet daily
- **Lanitis 40 units** at bedtime
- **lisinopril 20 mg** 1 tablet daily
- **metformin 1000 mg** 1 tablet 2 times a day
- **metoprolol XL 50 mg** 1 tablet daily
- **naproxen 500 mg** 1 tablet 2 times a day
- **omeprazole 20 mg** 1 tablet daily
- **pravastatin 40 mg** 1 tablet daily
- **trazodone 50 mg** 3 tablets at bedtime
- **warfarin 5 mg** 1 tablet daily on MWF, 1.5 tablets daily SuTuThSa

We can make that easier to read by **emphasizing** the name of the drug, and **de-emphasizing** everything else. One method is to use gray text that is perceptibly different while still readable.

Use just enough difference to “make it pop”.

Interactive widgets (tap to launch)

![Interactive Table Medication List]

**Interactive 3.1 Interactive Table Medication List**

<table>
<thead>
<tr>
<th>Name</th>
<th>Dose</th>
<th>Brand</th>
<th>Quantity</th>
<th>Unit</th>
<th>Refill</th>
<th>Prescribed</th>
<th>Provider</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>aspirin</td>
<td>81 mg</td>
<td>tablet daily</td>
<td>75</td>
<td>3</td>
<td>11 Oct 2011</td>
<td>Dr. Walter Lucas MD</td>
<td>Cardiovascular disease</td>
<td></td>
</tr>
<tr>
<td>chlorothalidone</td>
<td>25 mg</td>
<td>tablet daily</td>
<td>16</td>
<td>2</td>
<td>14 Oct 2011</td>
<td>Dr. Sofia Nayer MD</td>
<td>Hypertension</td>
<td></td>
</tr>
<tr>
<td>citalopram</td>
<td>20 mg</td>
<td>tablet daily</td>
<td>30</td>
<td>0</td>
<td>26 Sept 2012</td>
<td>Dr. Walter Lucas MD</td>
<td>Depression</td>
<td></td>
</tr>
<tr>
<td>Lanitis</td>
<td>40 units</td>
<td>vial</td>
<td>120 units</td>
<td>0</td>
<td>26 Sept 2012</td>
<td>Dr. Walter Lucas MD</td>
<td>Diabetes</td>
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</tr>
<tr>
<td>lisinopril</td>
<td>20 mg</td>
<td>tablet daily</td>
<td>30</td>
<td>0</td>
<td>11 Aug 2012</td>
<td>Dr. Walter Lucas MD</td>
<td>Hypertension</td>
<td></td>
</tr>
<tr>
<td>metformin</td>
<td>1000 mg</td>
<td>tablet daily</td>
<td>30</td>
<td>0</td>
<td>30 July 2012</td>
<td>Dr. Walter Lucas MD</td>
<td>Diabetes</td>
<td></td>
</tr>
<tr>
<td>metoprolol XL</td>
<td>50 mg</td>
<td>tablet daily</td>
<td>30</td>
<td>0</td>
<td>14 July 2012</td>
<td>Dr. Walter Lucas MD</td>
<td>Hypertension</td>
<td></td>
</tr>
<tr>
<td>naproxen</td>
<td>500 mg</td>
<td>tablet 2 times a day</td>
<td>30</td>
<td>0</td>
<td>30 June 2012</td>
<td>Dr. Walter Lucas MD</td>
<td>Renal/Arthritis</td>
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</tr>
<tr>
<td>omeprazole</td>
<td>20 mg</td>
<td>tablet daily</td>
<td>75</td>
<td>3</td>
<td>11 July 2011</td>
<td>Dr. Sofia Nayer MD</td>
<td>Gastroesophageal reflux disease</td>
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</tr>
<tr>
<td>pravastatin</td>
<td>40 mg</td>
<td>tablet daily</td>
<td>48</td>
<td>0</td>
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<td>Dr. Sofia Nayer MD</td>
<td>Hypertension</td>
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</tr>
<tr>
<td>trazodone</td>
<td>50 mg</td>
<td>tablets at bedtime</td>
<td>100</td>
<td>2</td>
<td>27 June 2012</td>
<td>Dr. Sofia Nayer MD</td>
<td>Depression</td>
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<tr>
<td>warfarin</td>
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<td>pill as needed</td>
<td>140</td>
<td>3</td>
<td>14 July 2013</td>
<td>Dr. Sofia Nayer MD</td>
<td>Anticoagulant</td>
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</tbody>
</table>

Tap to open the interactive widget of a patient’s medication list you can sort and filter.
Clinical focus

- Clinical scenarios
- Annotated makeovers
- Interactive widgets for deeper learning

<table>
<thead>
<tr>
<th>Name of medication</th>
<th>Instructions</th>
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<tbody>
<tr>
<td>aspirin 81 mg</td>
<td>1 daily</td>
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<tr>
<td>chlorthalidone 25 mg</td>
<td>1 daily</td>
</tr>
<tr>
<td>citalopram 20 mg</td>
<td>1 daily</td>
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<tr>
<td>Lantus</td>
<td>20 units at bedtime</td>
</tr>
<tr>
<td>lisinopril 20 mg</td>
<td>1 daily</td>
</tr>
<tr>
<td>metformin 1000 mg</td>
<td>1 twice a day</td>
</tr>
<tr>
<td>metoprolol XL 50 mg</td>
<td>1 daily</td>
</tr>
<tr>
<td>naproxen 500 mg</td>
<td>1 twice a day</td>
</tr>
<tr>
<td>omeprazole 20 mg</td>
<td>1 daily</td>
</tr>
<tr>
<td>pravastatin 40 mg</td>
<td>1 daily</td>
</tr>
<tr>
<td>trazodone 50 mg</td>
<td>2 at bedtime</td>
</tr>
<tr>
<td>warfarin 5 mg</td>
<td>1 daily MWF, 1.5 tabs daily TuThSaSu</td>
</tr>
</tbody>
</table>

Is this for hypertension? How about this one? Yes. Or this one? Or this one? Or this one? ...
Concern about guidelines becoming a requirement

Strong interest in seeing more, commenting, sharing with others

What and how strong is the evidence?
Questions?