Addressing Clinician Burden through Usability

Ross Teague, Ph.D.
Director of User Experience
Allscripts

HIMSS ARIZONA Chapter

We Believe

Clinician burden is not a new phenomenon

Burden impact is not limited to clinicians

Clinician burden requires a system approach to solve the problem

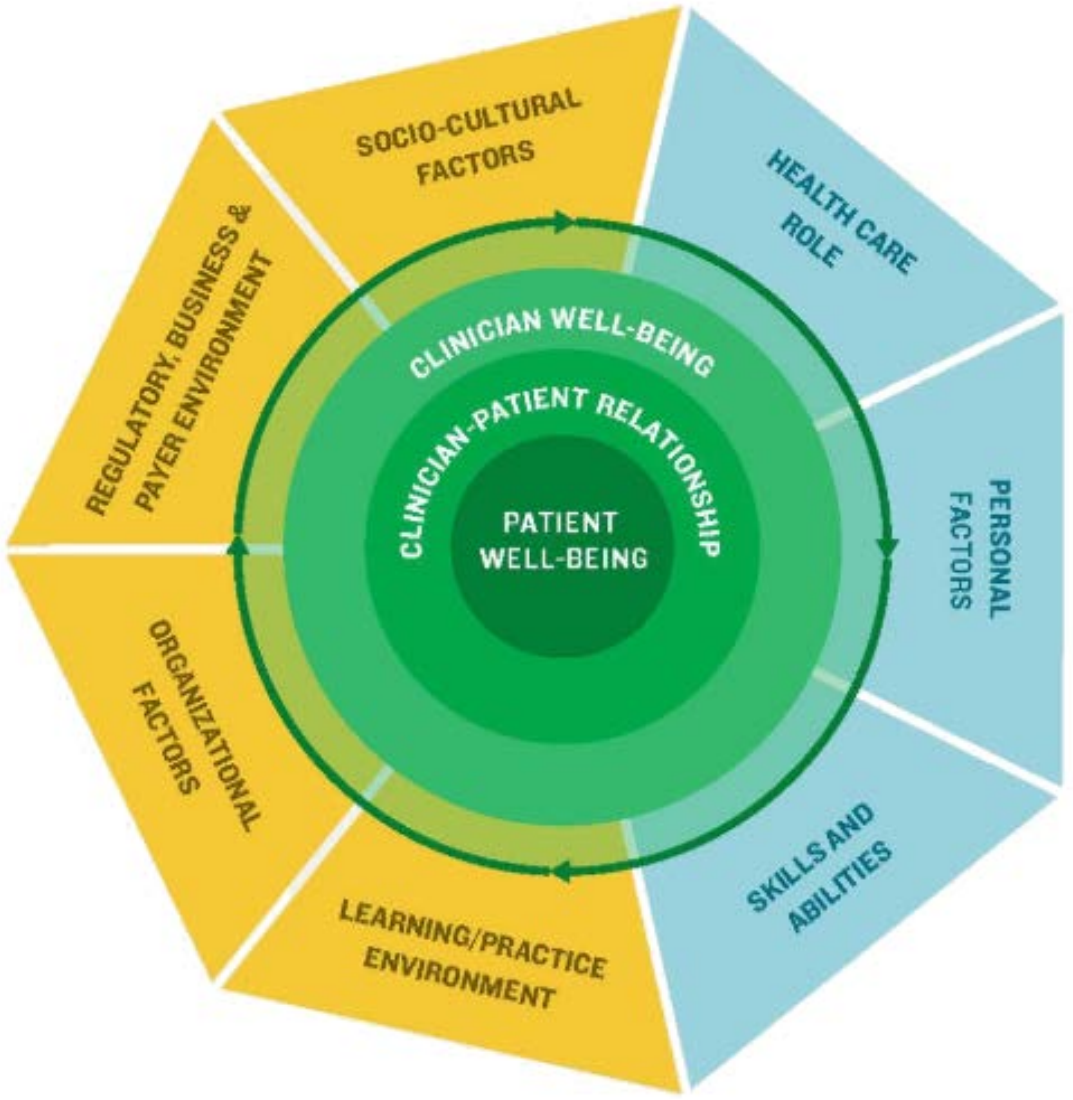
Causes of Burden

External Factors

- Socio-cultural
- Regulatory, Business, & Payer
- Organizational factors
- Learning/Practice Environment

Individual Factors

- Health Care role
- Personal Factors
- Skills and Abilities



Causes of Burden

- Autonomy
- Collaborative vs. competitive environment
- Curriculum
- **Health IT Interoperability and Usability of Electronic Health Records**
- Learning and practice setting
- Mentorship
- Physical learning and practice conditions
- Professional relationships
- Student affairs policies
- Student-centered and patient-centered focus
- Team structures and functionality
- Workplace safety and violence

We Believe

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Burden impact is not limited to clinicians

Clinician burden requires a system approach to solve the problem

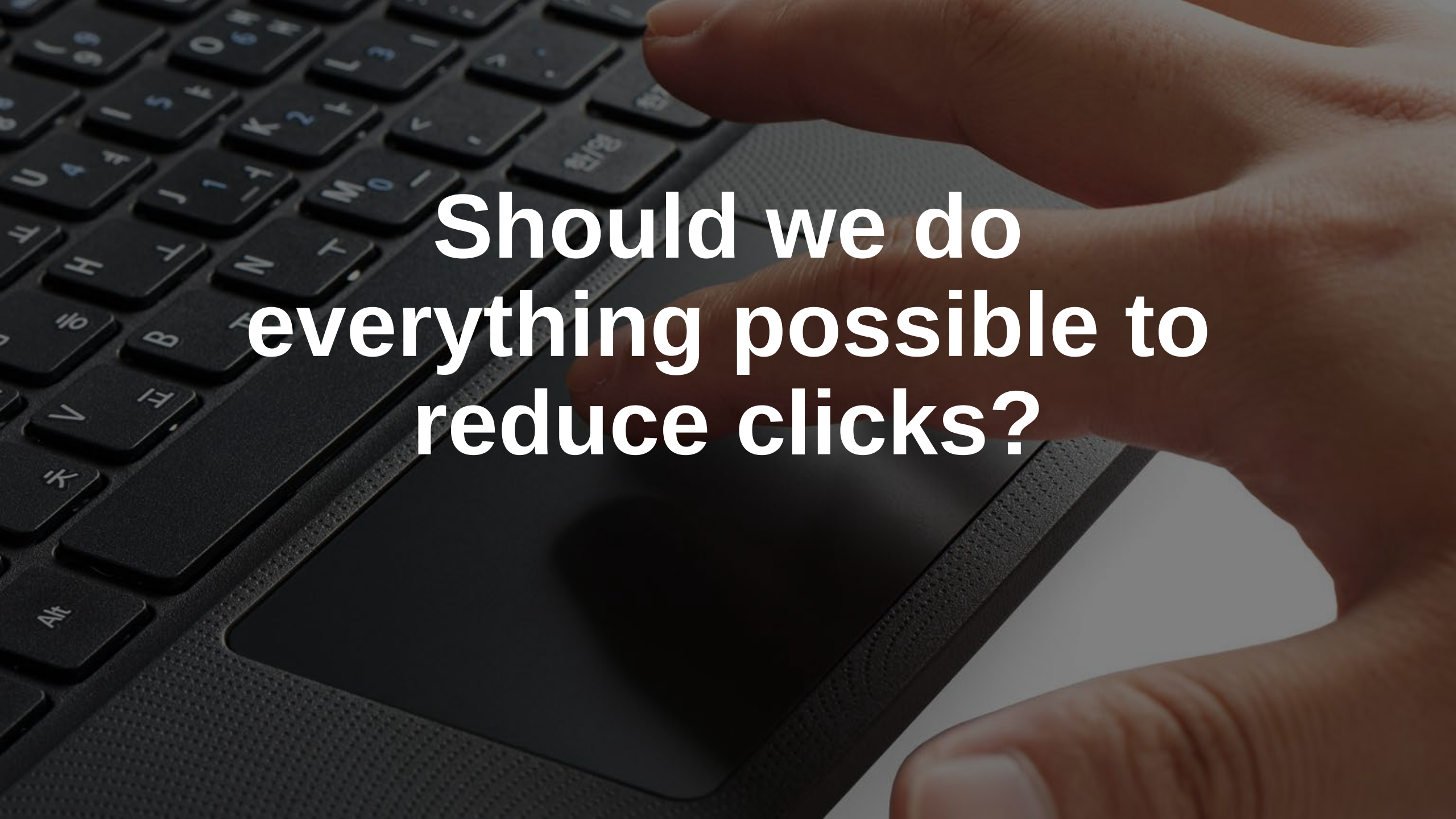
HIT vendors have a great opportunity to address

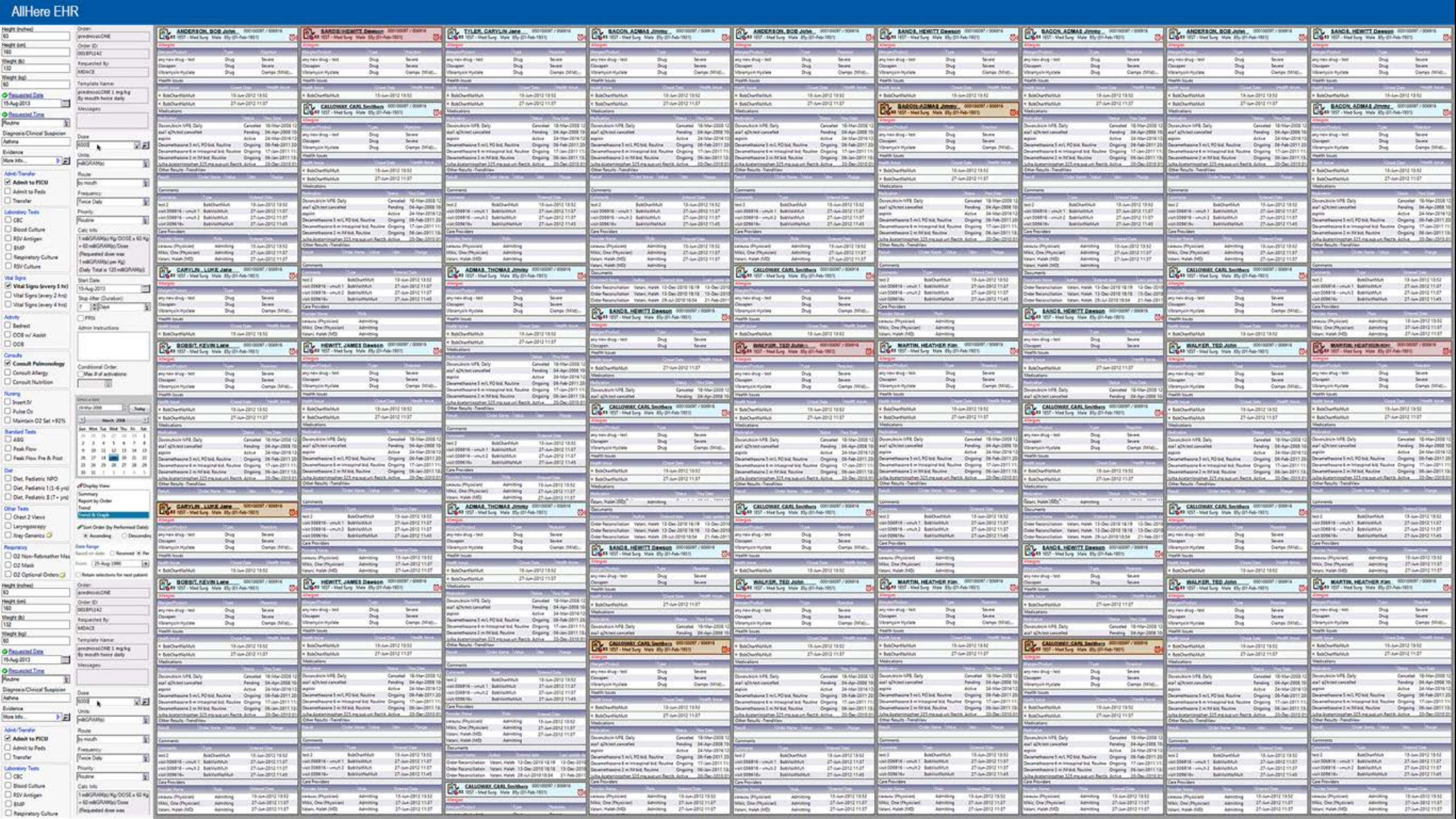
Usability Reduces Burden

Efficiency	Effectiveness	Satisfaction
Speed	Outcomes	Less burdened
Less steps	Safe	Respected
Intuitive	Learning	Peace of mind
No waste	Goal-centered	Trust

User Profiles

Create


Should we do everything possible to reduce clicks?


AllHere EHR

Cognitive

Visual

Motor

Difficult

Easy

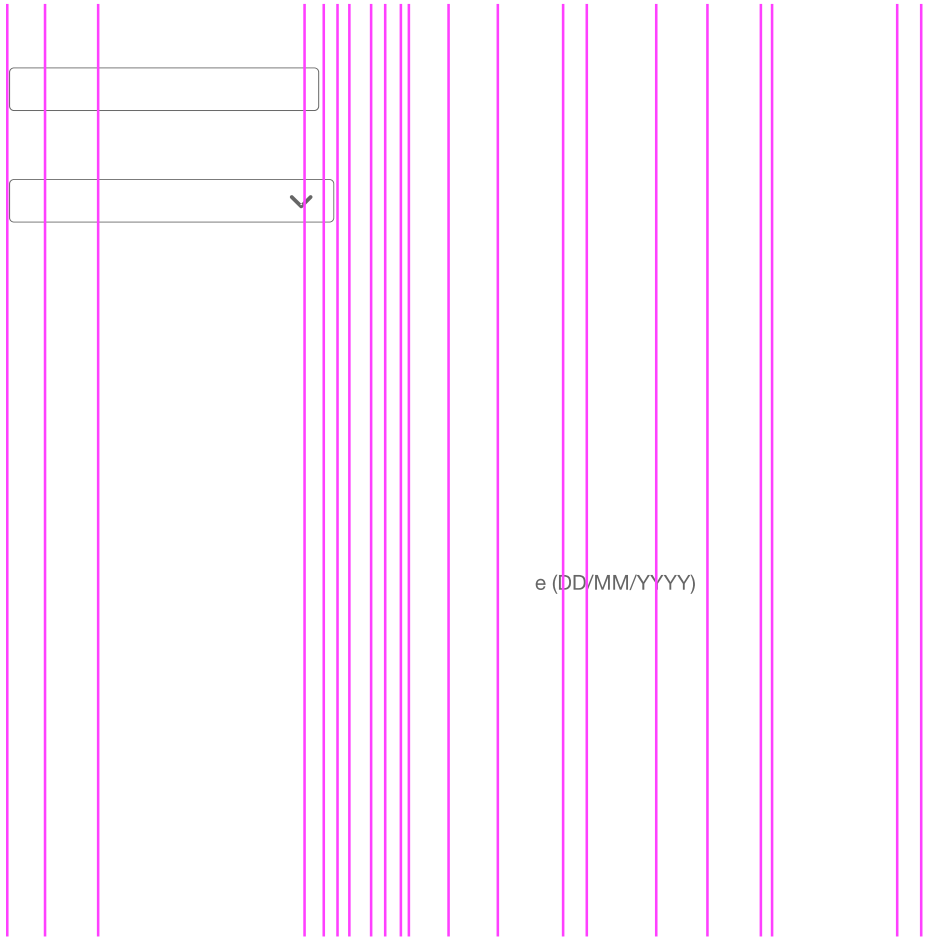
Cognitive Friction and the Science of Usability

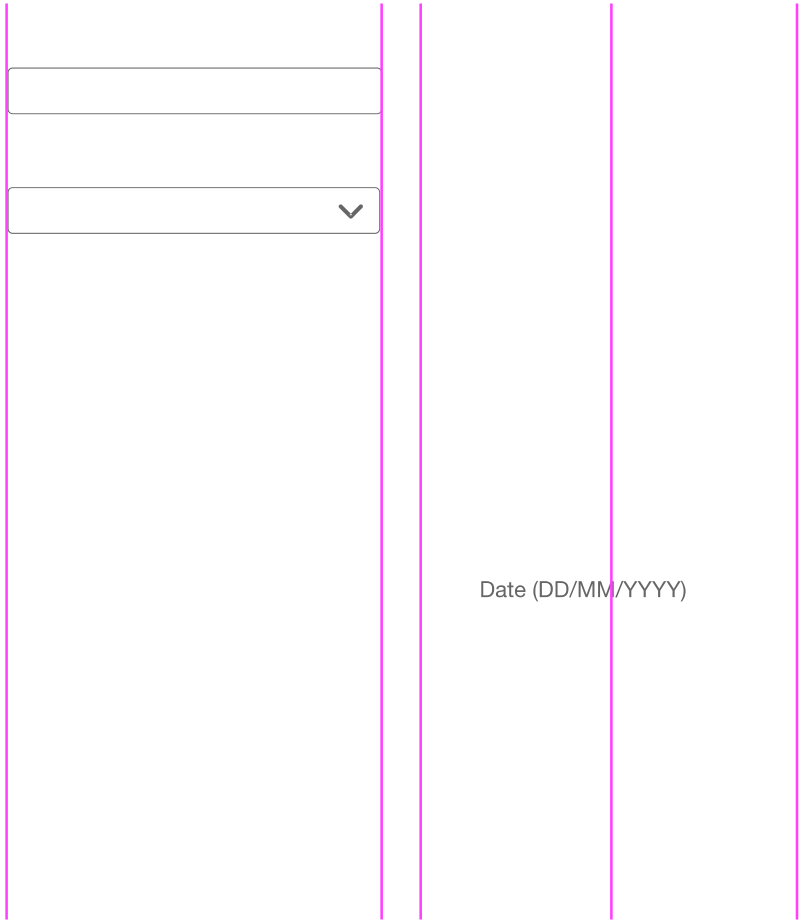

LET'S
MAKE
A
DEAL

$$P(A_r|B) = \frac{P(B|A_r)P(A_r)}{P(B)} = \frac{\frac{1}{2}\cdot\frac{1}{3}}{\frac{1}{2}} = \frac{1}{3}$$

$$P(A_g|B) = \frac{P(B|A_g)P(A_g)}{P(B)} = \frac{1\cdot\frac{1}{3}}{\frac{1}{2}} = \frac{2}{3}$$

$$P(A_b|B) = \frac{P(B|A_b)P(A_b)}{P(B)} = \frac{0\cdot\frac{1}{3}}{\frac{1}{2}} = 0.$$





More time
More cognitive burden
Increased risk of mistakes

Feb-12-2016	2/12/2016
Nov-01-2013	11/01/2013
Nov-11-2010	11/11/2010
Jun-28-2015	06/28/2015
Aug-04-1998	08/04/1998
May-19-2017	05/19/2017
Sep-10-2014	09/10/2014
July-09-2014	07/09/2014

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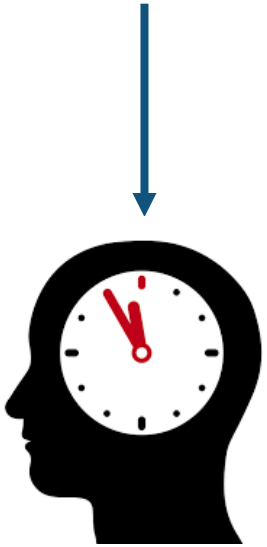
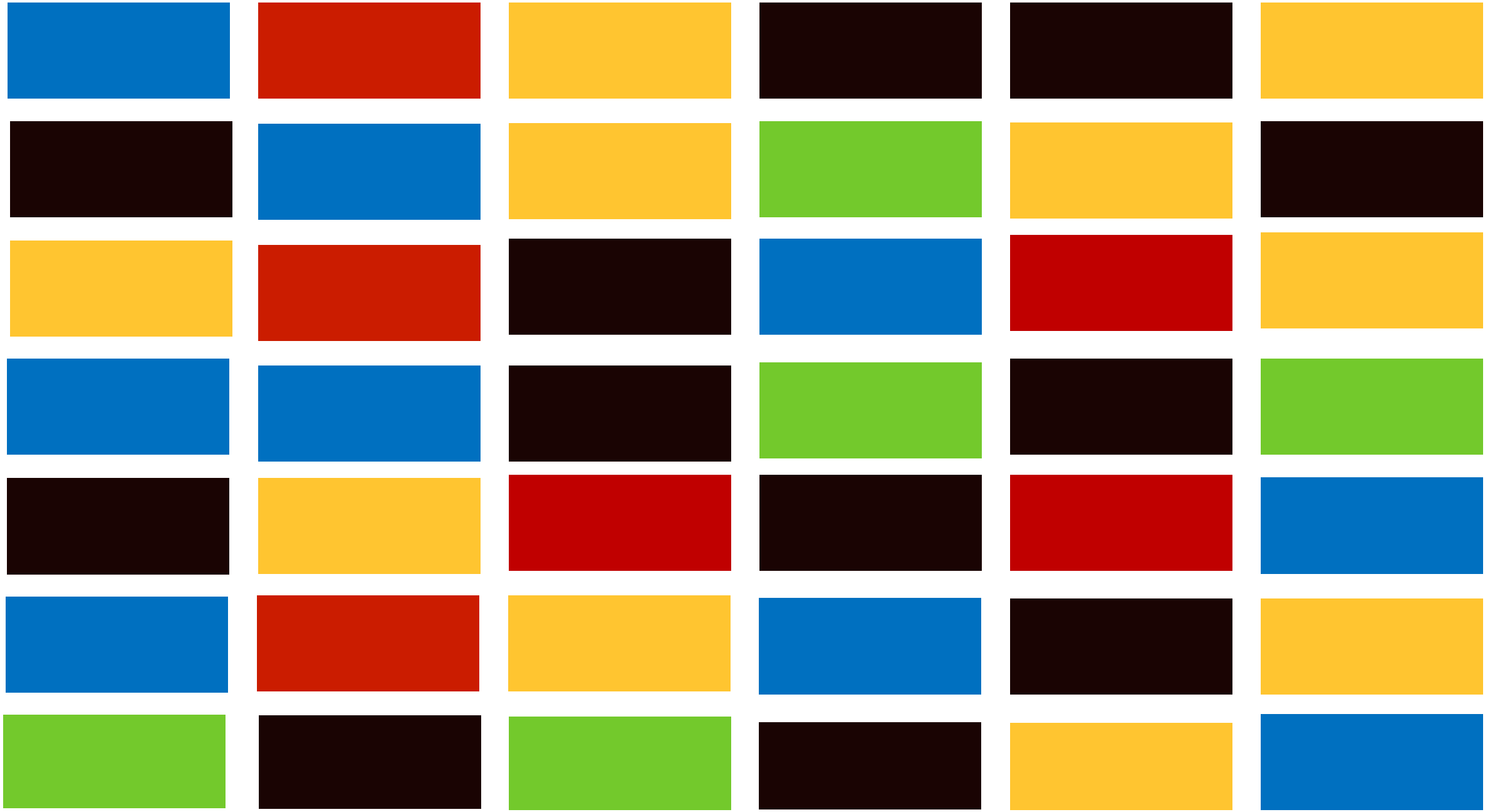
Sep-10-2014	09/10/2014
July-09-2014	07/09/2014
8-10 sec.	**14-18** sec. **+ more errors**

10/12/2016



October



HIMSS ARIZONA Chapter

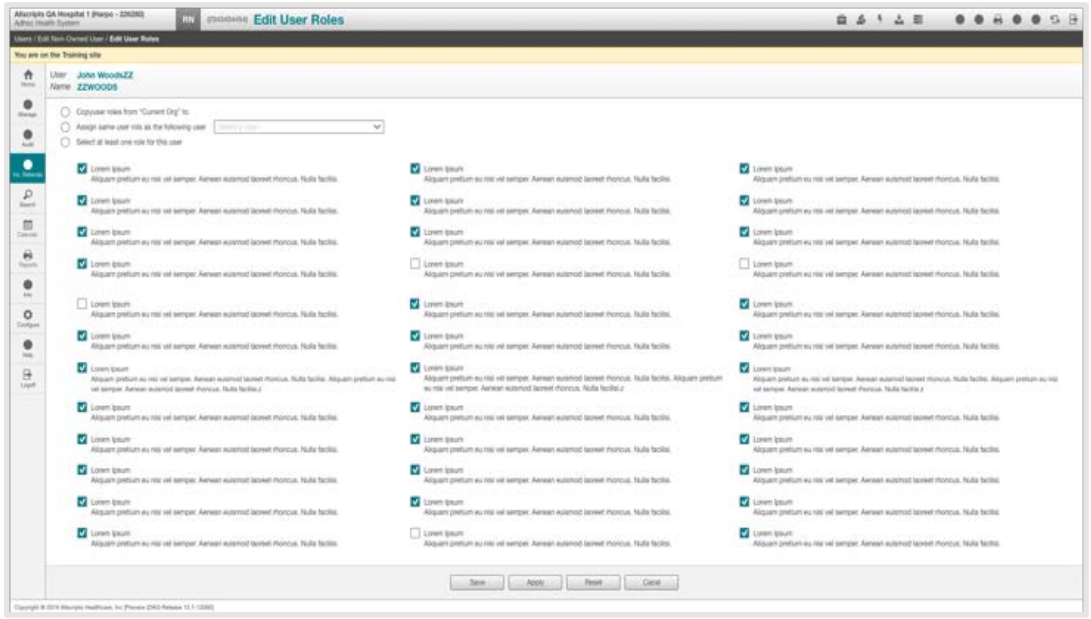
tableau

BLUE

BLUE	YELLOW	RED	GREEN	BLACK
YELLOW	BLUE	BLACK	RED	BLUE
RED	YELLOW	GREEN	YELLOW	BLACK
YELLOW	BLACK	YELLOW	BLUE	BLUE
GREEN	RED	YELLOW	BLACK	GREEN
YELLOW	BLUE	GREEN	RED	YELLOW

Green means “everything is fine”
(and it doesn’t mean that here)

Poor contrast reduces readability



More time, more cognitive burden, and increase the risk of mistakes?

The color green draws our attention.
In this case, away from the data that is most important

Location	# of Patients	Target	Trend
ICU	43	35	43 ↗
Pediatric	12	10	10 ↘
Cardio	27	25	25 ↘
Surgery	22	20	22 ↗
Other	15	10	10 ↘

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Contrast is important

because it has a HUGE

impact on fluency and

adds to the cognitive tax

that our users have to pay.

Ratio: 4.5 to 1

WCAG 2.0 level AA requires a contrast ratio of **4.5:1**. Level AAA requires a contrast ratio of 7:1 for normal text and **4.5:1** for large text. (http://webaim.org/resources/contrastchecker/)

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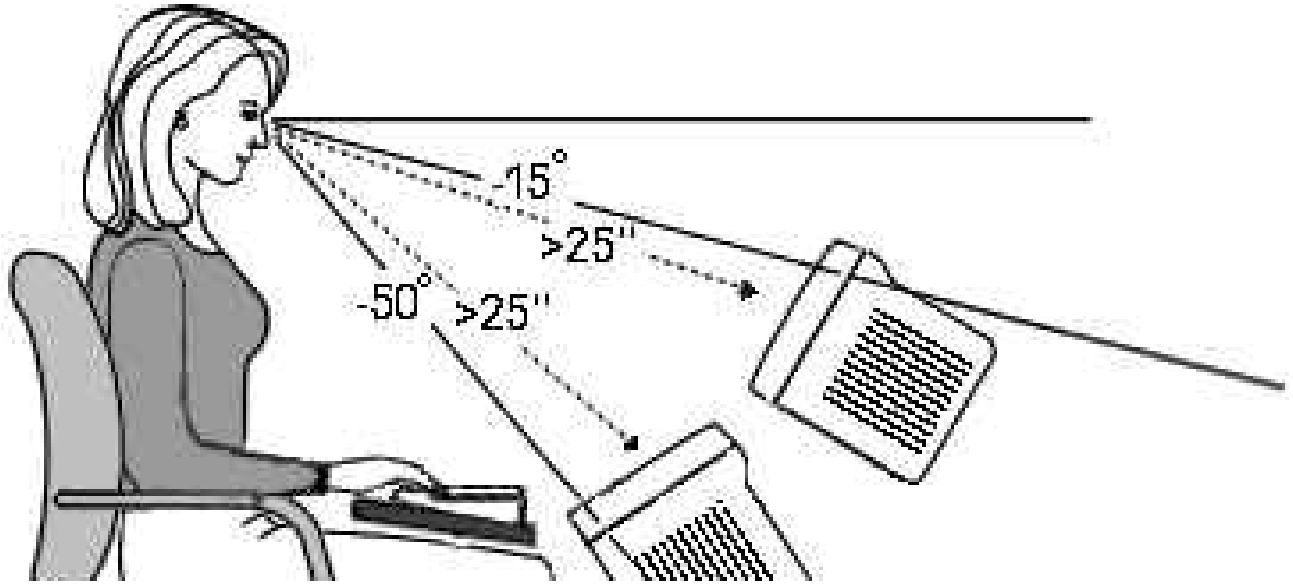
007 Rule

Distance X .007 = Text Height

Distance from computer (~18 inches) X .007 = .126



HIMSS ARIZONA Chapter

tableau

The Science Tells Us…

- Larger fonts
- Less color
- Narrower columns
- Less information
- More white space
- Alignment and hierarchy
- …

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- Larger fonts
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Greater efficiency

More effective

Higher satisfaction

Safer

Better decisions


LET'S
MAKE
A
DEAL

Helper Philosophy


UnionTools


UnionTools
TRUE TEMPER


UnionTools

Ross: Tell me about your day.

Doctor: I work in the office and I work at home. After I put my kids to bed...around 9pm...I get onto my EHR and I start getting ready for the next day.

I go in and prep every note for the next day. I want to make sure that I'm aware of what's happening ahead of time. I'm looking through each client to know why they are coming in, what's happened since I last saw them, just getting ready. I figure out what these codes mean. I know that the information I need is here, I just have to find it that way I relieve my stress. I'm also getting things out of the way that I don't need to see and making sure the things I will need are easy to get to.

It takes a lot of time (and clicks) but it's worth it. It helps to make the patients feel confident and for me to get out of the office in time for dinner with my kids.

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Note prep feature

Mobile

Care plan view

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Schedule view

Code dictionary

More data

Another icon

Less clicks

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Warn **Compare**

Translate

Assure **Hide** **Status**

Highlight **Notify**

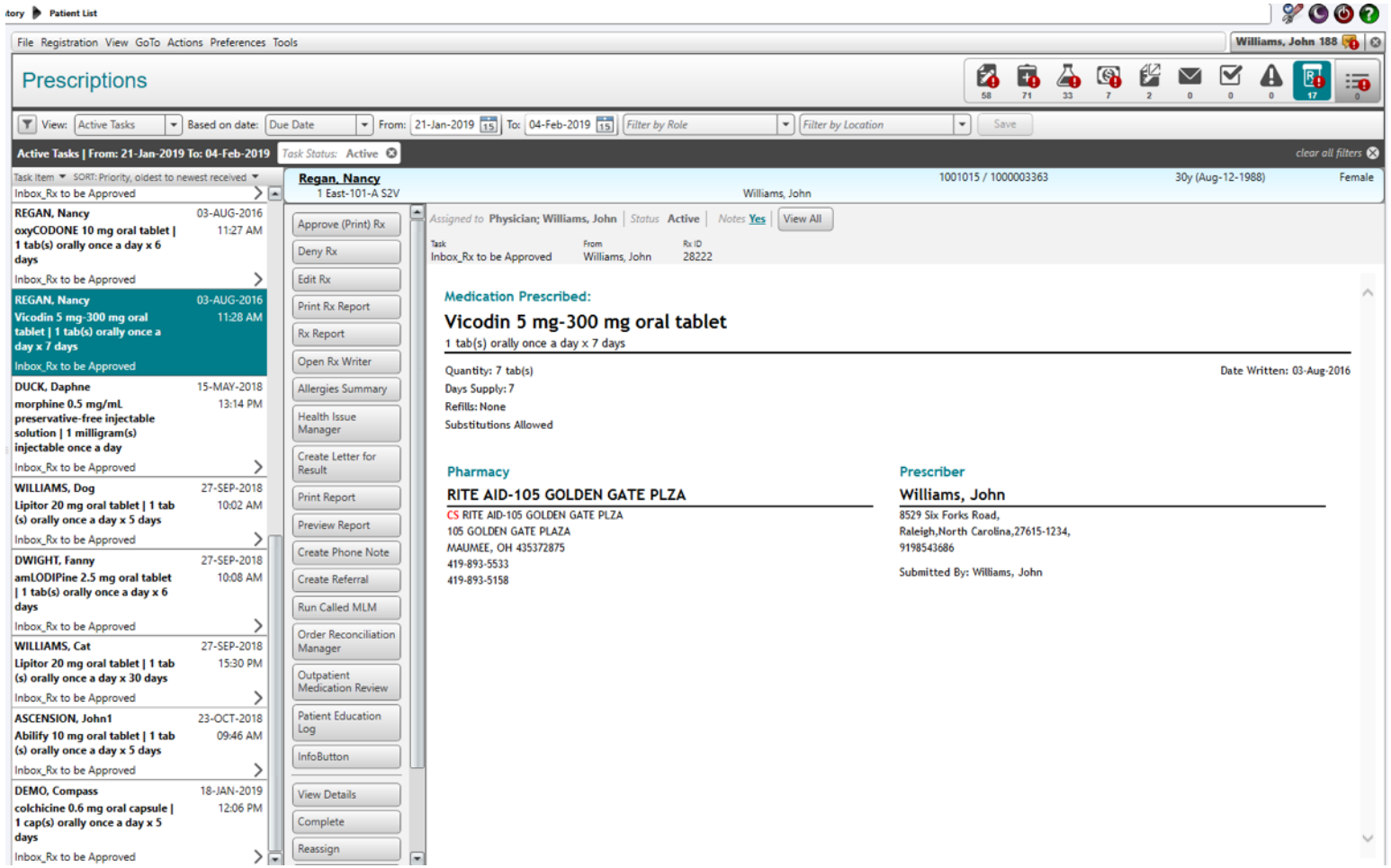
Trend **Remove surprises**

Complete

Orient **Guide**

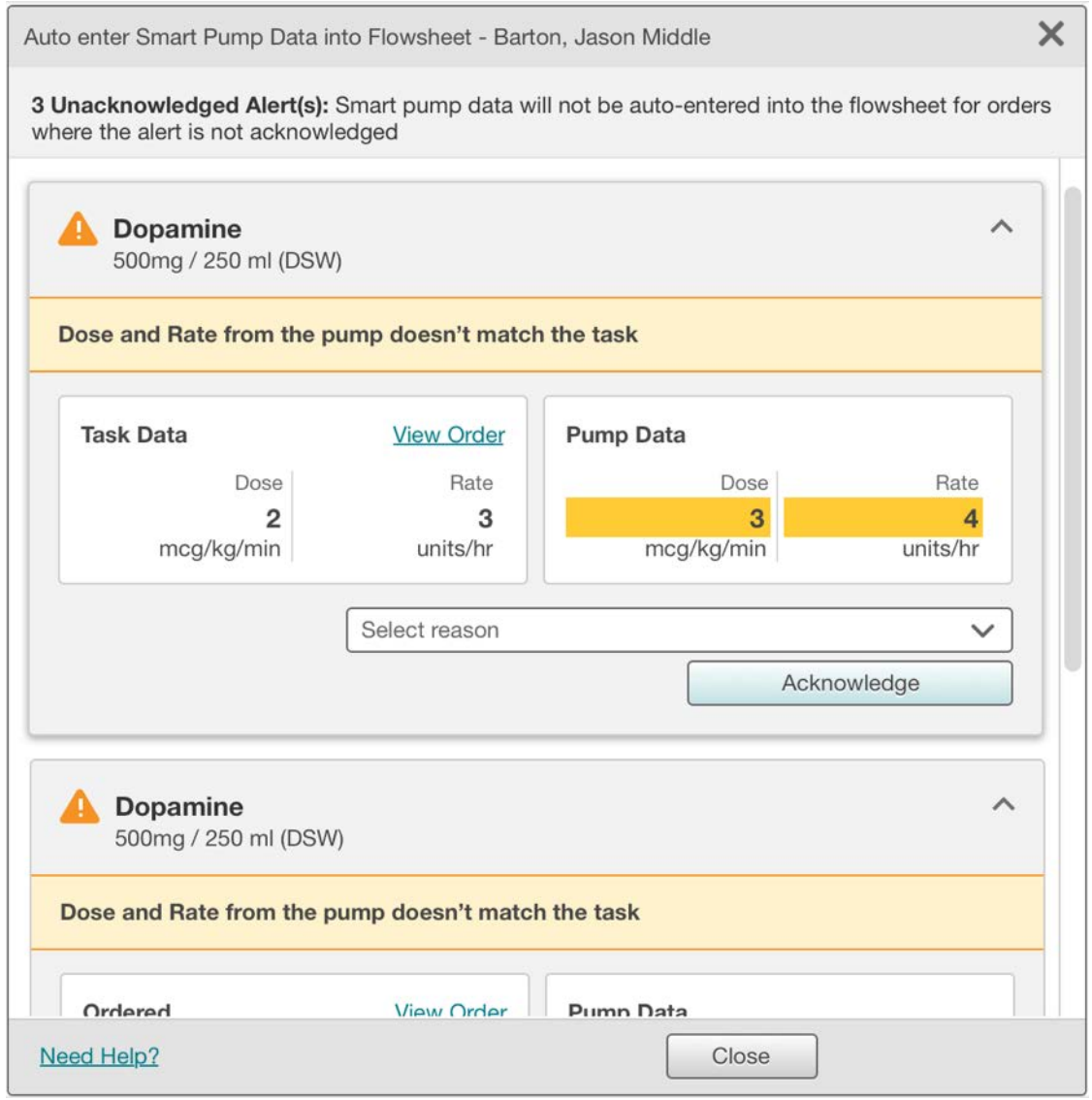
Design Science + Helpfulness

Acute - Tasking



- Reduced icons and colors to focus on tasks
- Access relevant information without leaving the screen
- Tasking-centric view to reduce distractions
- Improved subjective usability by almost 200%

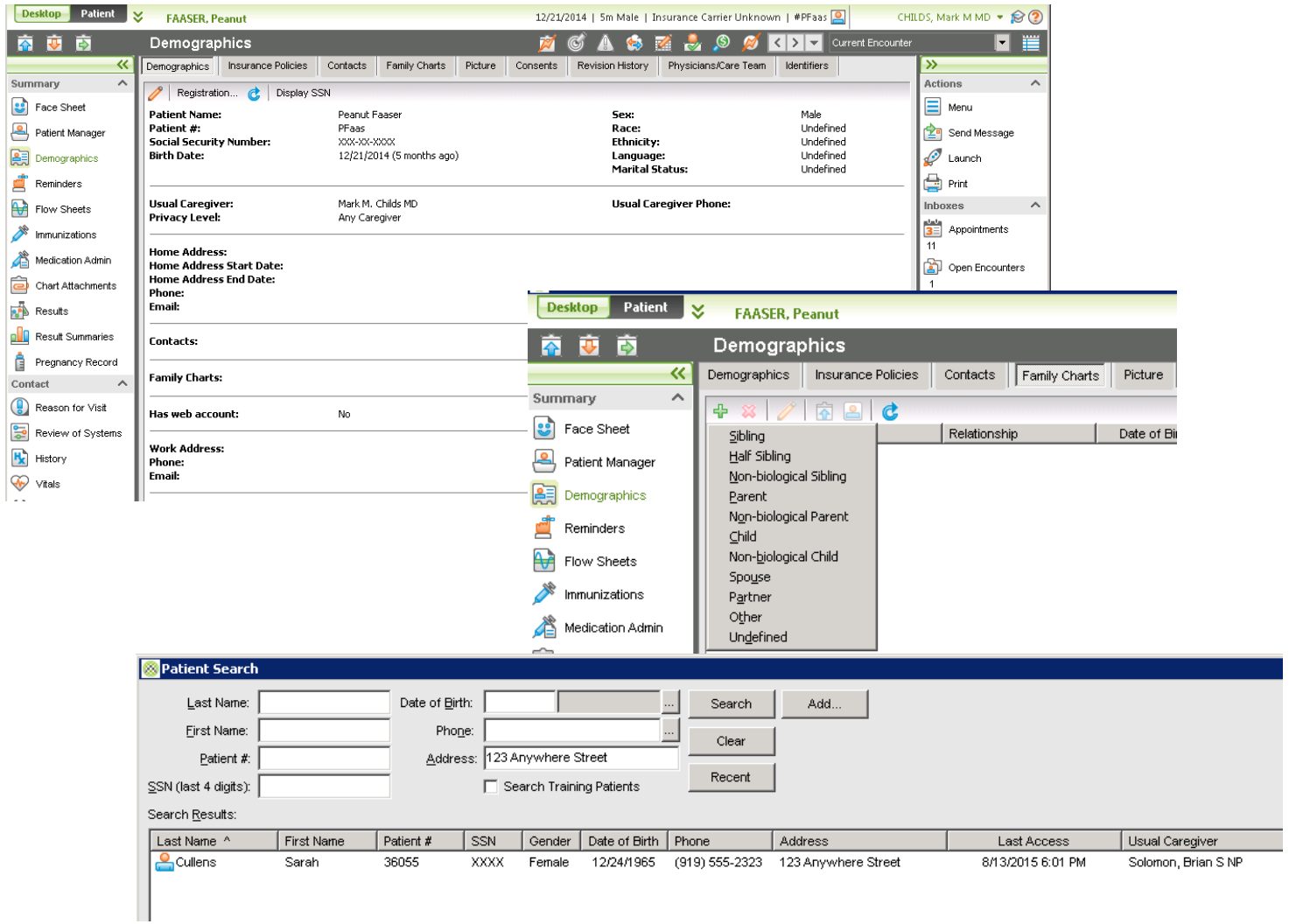
Acute – Smart Pump



- Visual design to enhance readability and understanding
- System points out differences to the user instead of the user having to determine

- *"This is the best alert window I've ever seen by any of the vendors!"* – *smart pump vendor comment*

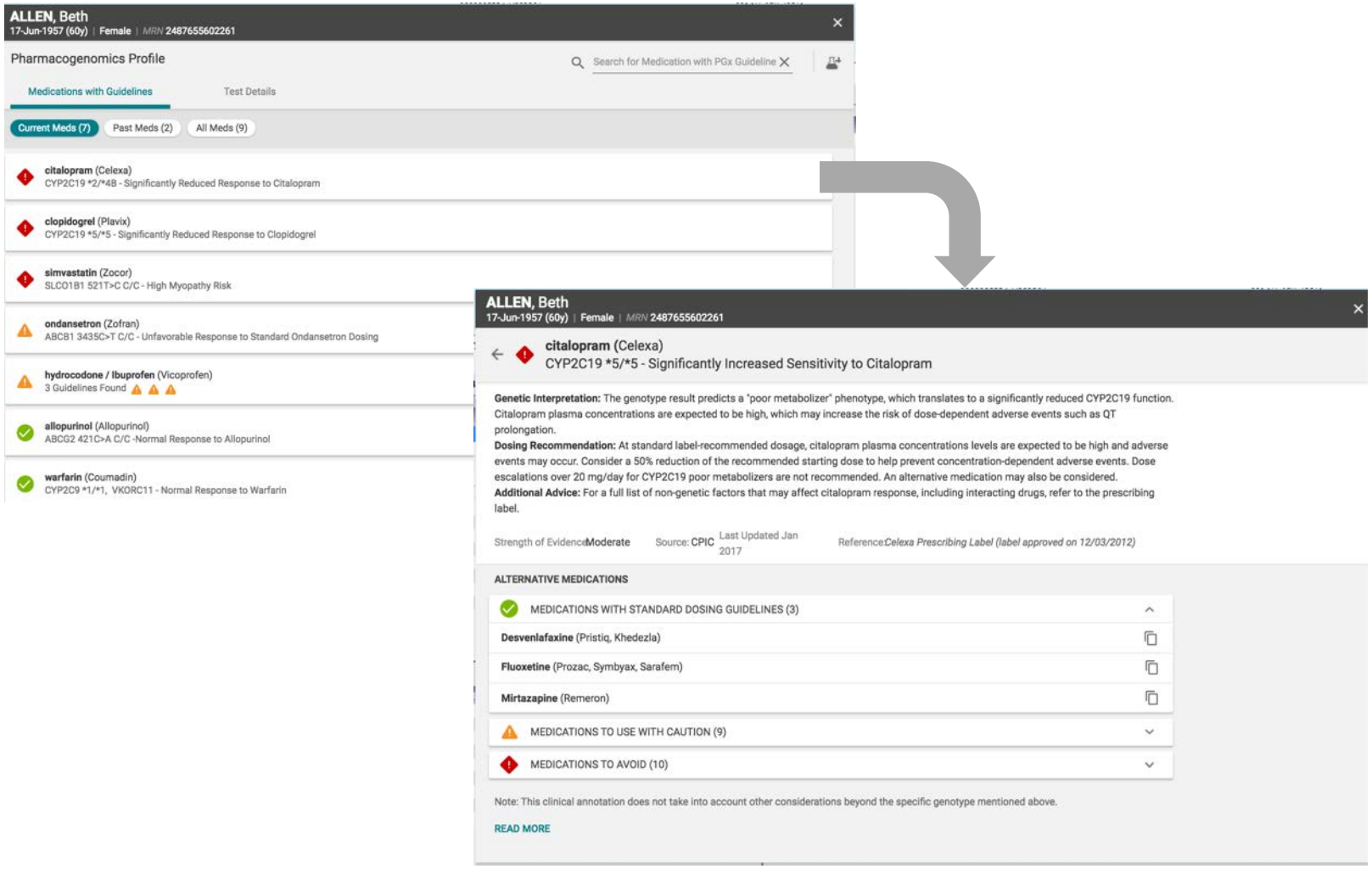
Ambulatory – Linking Family Members



- Family Charts provide the capability of linking family members and sharing pertinent history items
- Saves time and increases accuracy
- Search query pre-filled with most likely search terms

- *"I've got to go and tell everyone in the practice about this!"*

Pharmacogenomic – Progressive Display



- Appropriate use of color and organization to reduce cognitive effort
- Organizes information by medication and alternatives to help those new to using pharmacogenomic information

Usability

+ Helpfulness

[illegible]
deserve

Questions?