Emerging Health Technology Investigations Support

EHT CPRS Workflow & Response Time

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Overview

EHT sought to identify clinical workflow and response time improvement opportunities using simulation technologies

- **Inspired by work done at Massachusetts General Hospital**
- **Software applications concerns, some are over 25 years old, maybe outmoded and inefficient**
- **Need to quantify VHA's unwritten 2-second transaction response time rule**

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Approach

- Identify high-value, frequently performed tasks at four VAMC locations
- Shadow clinicians at each site, observe task workflow and interaction with CPRS
- Analyze findings, document cross-cutting issues
- Devise candidate alternative solutions
- Validate candidate solutions with clinicians using simulated CPRS screens
- Document functional requirements for recommended solutions

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Anticipated Benefits

- **Workflow efficiencies**
  - **Save clinicians time, improve user experience for frequently performed tasks**
  - **Allow clinicians more time for direct patient care**
- **User response time preferences**
  - **Establish acceptable user response time threshold**

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Summary of Study Findings

- **Workflow Impact**
  - **34 recommendations regarding 8 high-value, frequently performed tasks**
- **Timesaving**
  - **Potential to save 28 minutes per day per physician**
- **Keystroke Reduction**
  - **Keystroke reduction across all 8 high-value, frequently performed tasks**

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Summary of Study Findings (cont.)

- **User Response Time Preference Test Results**
  - Quantified VHA 2 second transaction response time rule
- **Task Order Ranking**
  - Clinician rank ordering of importance the 8 high-value, frequently performed tasks
  - Cover Sheet (Interactive Functionality) ranked as #1

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Workflow Impact

Print Patient List

- Print personalized patient list (name and location)
- Impacts hospital setting, obviates need for clinician to leave CPRS to perform clerical task

Dashboard Functionality

- Accessing multiple patients' information from one screen
- Impacts hospital setting, enables clinician to quickly triage assigned patients

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Workflow Impact (cont.)

Cover Sheet (Postings)

- Highlights importance of first glance information
- Impacts hospital and clinic settings, enables clinician to quickly confirm specific posting information

Cover Sheet (Interactive Functionality)

- Adding additional functionality to Cover Sheet (starting new note, changing meds, ordering labs)
- Impacts hospital setting, enables clinician to conduct patient encounter without leaving Cover Sheet

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Workflow Impact (cont.)

Accessing Data Behind Templates and Consults

- Capability to access additional patient data while completing locally developed template or consult
- Impacts hospital and clinic settings, enables clinician to retain information entered in template or consult while accessing other screens

Medication Sorting

- Capability to sort and compare inpatient, outpatient, and non-VA medications in Medication Screen
- Impacts hospital and clinic settings, enables clinician to more quickly reconcile patient's medication profile

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Workflow Impact (cont.)

Sorting and Finding Orders

- Capability to sort, quickly identify patient orders
- Impacts hospital and clinic settings, enables clinician to more quickly identify patient's order

CPRS Interaction with BCMA

- Link CPRS and BCMA to automatically synchronize patient information between the applications
- Impacts inpatient nursing, potentially reduces possibility of patient medication error

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Projected Time Savings

High-Value, Frequently Performed Task	Average Savings per Task (*Seconds)	Used During the Day	Total Savings (*Seconds)
Print Patient List	49	1	49
Dashboard Functionality	14	7	98
Cover Sheet (Postings)	15	7	105
Cover Sheet (Interactive Functionality)	19	7	133
Accessing Data Behind Templates and Consults	17	7	119
Sorting and Comparing Medications	104	7	728
Sorting and Finding Orders	60	7	420
Savings in Seconds			1,652
Savings in Minutes			28*

*Results rounded to the neared second/minute

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Keystroke Savings

High-Value, Frequently Performed Task	Keystroke for As-Is Scenario	Keystroke for To-Be Scenario	Keystroke Difference
Print Patient List	21	2	19
Dashboard Functionality	10	4	6
Cover Sheet (Postings)	6	1	5
Cover Sheet (Interactive Functionality)	7	4	3
Accessing Data Behind Templates and Consults	17	12	5
Medication Sorting	Manual Process	2	NA
Sorting and Finding Orders	5	4	1
CPRS Interaction with BCMA	4	0	4

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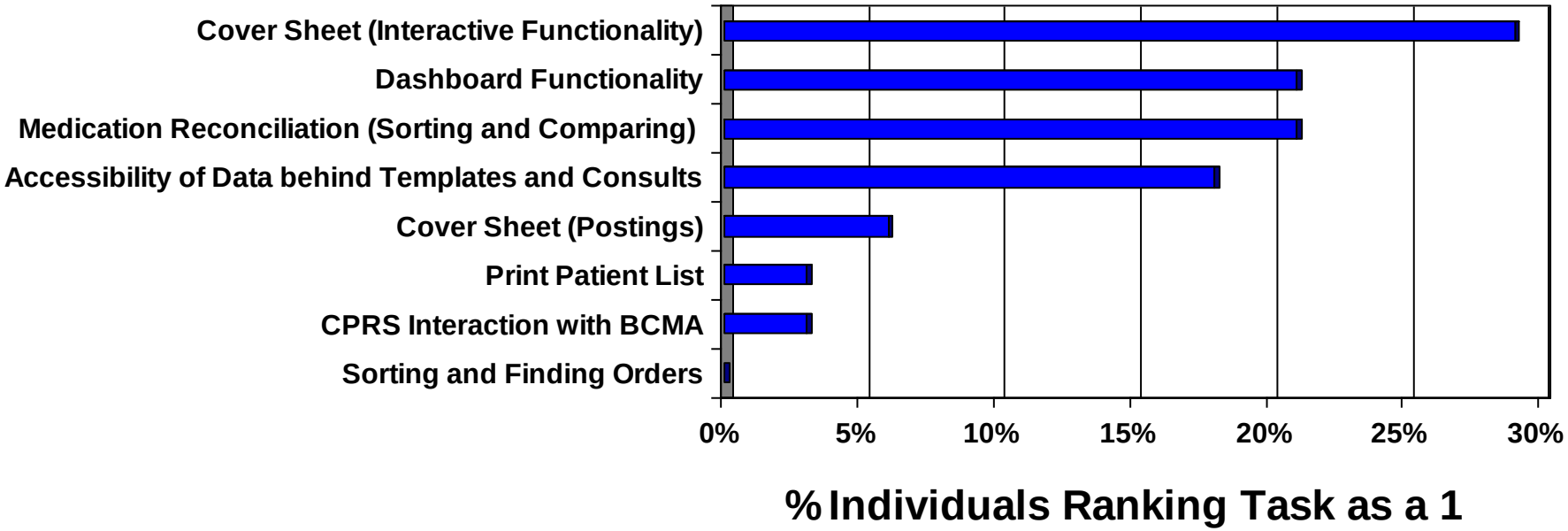
Task Order Ranking Results by Workflow Impact



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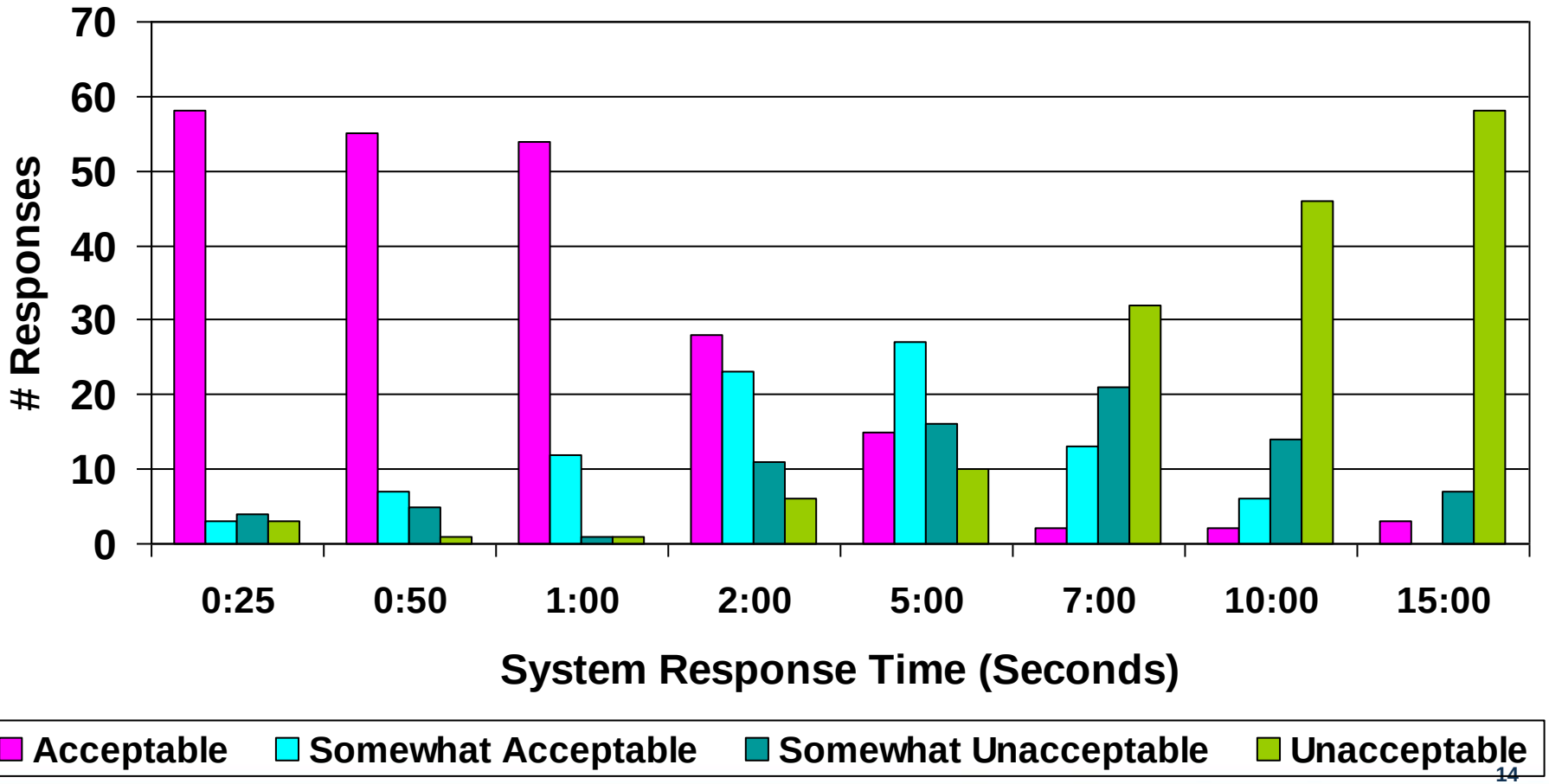
User Response Time Preference Test Results



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Thank You

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Questions?

Background Support Material

Task Summaries

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Print Patient List

- **Definition: Print personalized patient list (name and location)**
- **Average time savings: 49 seconds (+/- 9 seconds)**
- **Keystroke/click savings: 19 seconds**
- **Task ranking: Bottom half by doctors and nurses**

Impact: Hospital setting, obviates need for clinician to leave CPRS to perform clerical task

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Dashboard Functionality

- **Definition: Accessing multiple patients' information from one screen**
- **Average time savings: 14 seconds (+/- 4 seconds)**
- **Keystroke/click savings: 6 seconds**
- **Task ranking: Top half by doctors and nurses**

Impact: Hospital setting, enables clinician to quickly triage assigned patients

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Cover Sheet (Postings)

- **Definition: Highlights importance of first glance information**
- **Average time savings: 15 seconds (+/- 7 seconds)**
- **Keystroke/click savings: 5 seconds**
- **Task ranking: Lower half by doctors, top half by nurses**

Impact: Hospital and clinic settings, enables clinician to quickly confirm specific posting information

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Cover Sheet (Interactive Functionality)

- **Definition: Adding additional functionality to cover screen (starting new note, changing meds, ordering labs)**
- **Average time savings: 19 seconds (+/- 6 seconds)**
- **Keystroke/click savings: 3 seconds**
- **Task ranking: Top half by doctors and nurses**

Impact: Hospital setting, enables clinician to conduct patient encounter without leaving cover screen

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Accessing Data Behind Templates and Consults

- **Definition: Capability to access additional patient data in CPRS while completing a locally developed template**
- **Average time savings: 17 seconds (+/- 6 seconds)**
  - **17 seconds represents "best case" scenario**
  - **Templates are developed locally, thus vary in length and complexity**
  - **Time savings based on closing out template after first two questions (template close out occurs well into completing template)**

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Accessing Data Behind Templates and Consults (cont.)

- **Keystroke/click savings: 4 seconds**
- **Task ranking: Top half by doctors and nurses**

Impact: Hospital and clinic settings, enables clinician to retain information entered in template or consult while accessing other screens

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Medication Sorting

- **Definition: Capability to sort and compare inpatient, outpatient, and non-VA medications in Medication screen**
- **Average time savings: 104 seconds (+/- 17 seconds)**
- **Keystroke/click savings: NA (compared against manual process)**
- **Task ranking: Top half by doctors, bottom half by nurses**

Impact: Hospital and clinic settings, enables clinician to more quickly reconcile patient's medication profile

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Sorting and Finding Orders

- Definition: Capability to sort, quickly identify patient orders
- Average time savings: 60 seconds (+/- 14 seconds)
- Keystroke/click savings: 1 second
- Task ranking: Bottom half by doctors and nurses

Impact: Hospital and clinic settings, enables clinician to more quickly identify patient's order

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CPRS Interaction with BCMA

- **Definition: Link CPRS and BCMA to automatically synchronize patient information between the applications**
- **Average time savings: NA (Could not be modeled in iRise)**
- **Keystroke/click savings: 4 seconds**
- **Task ranking: Bottom half by doctors (do not use application) and nurses**

Impact: Inpatient nursing, has potential to reduce possibility of patient medication error

User Response Time Preference Test Results

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User Response Time Preference Test Results

Time (Seconds)	Acceptable Response Time	Somewhat Acceptable Response Time	Somewhat Unacceptable Response Time	Unacceptable Response Time
0.25	58 (86%)	3 (4%)	4 (6%)	3 (4%)
0.50	55 (82%)	7 (10%)	5 (7%)	1 (1%)
1:00	54 (80%)	12 (18%)	1 (1%)	1 (1%)
2:00	28 (41%)	23 (34%)	11 (16%)	6 (9%)
5:00	15 (22%)	27 (40%)	16 (23%)	10 (15%)
7:00	2 (3%)	13 (19%)	21 (31%)	32 (47%)
10:00	2 (3%)	6 (9%)	14 (21%)	46 (67%)
15:00	3 (4%)	0 (0%)	7 (10%)	58 (86%)

Task Order Ranking

Individual Facility Perspective

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Highest Impact on Job Workflow

VAMC Albany

- **Doctors:**
  - **60% selected Cover Sheet (Interactive Functionality)**
- **Nurses:**
  - **50% selected Templates and Consults**

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Highest Impact on Job Workflow (cont.)

VAMC Baltimore

- **Doctors:**
  - 33% selected Dashboard
  - 33% selected Cover Sheet (Interactive Functionality)
  - 33% selected Medication Sorting
- **Nurses:**
  - 50% selected Cover Sheet (Interactive Functionality)

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Highest Impact on Job Workflow (cont.)

VAMC Bay Pines

- **Doctors:**
  - 33% selected Dashboard
  - 33% selected Cover Sheet (Interactive Functionality)
  - 33% selected Medication Sorting
- **Nurses:**
  - 50% selected Templates and Consults
  - 25% selected Dashboard
  - 25% selected Cover Sheet (Interactive Functionality)

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Highest Impact on Job Workflow (cont.)

VAMC West Roxbury

- **Doctors:**
  - 40% selected Medication Sorting
  - 60% selected Medication Sorting as priority # 2
- **Nurses:**
  - 33% selected Medication Sorting
  - Remainder divided evenly between:
    - Dashboard
    - Cover Sheet (Postings)
    - Cover Sheet (Interactive Functionality)

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Combined Task Order Ranking Results

Scale	Print Patient List	Dashboard Functionality	Cover Sheet (Postings)	Cover Sheet (Interactive Functionality)	Accessibility of Data behind Templates and Consults	Medication Reconciliation (Sorting and Comparing)	Sorting and Finding Orders	CPRS Interaction with BCMA
1	1 (3%)	7 (21%)	2 (6%)	10 (29%)	6 (18%)	7 (21%)	0 (0%)	1 (3%)
2	1 (3%)	7 (21%)	2 (6%)	9 (26%)	9 (26%)	5 (15%)	1 (3%)	0 (0%)
3	3 (9%)	4 (12%)	5 (15%)	3 (9%)	7 (21%)	4 (12%)	7 (21%)	1 (3%)
4	4 (12%)	7 (21%)	6 (18%)	3 (9%)	5 (15%)	3 (9%)	4 (12%)	2 (6%)
5	6 (18%)	4 (12%)	4 (12%)	7 (21%)	2 (6%)	6 (18%)	3 (9%)	2 (6%)
6	2 (6%)	0 (0%)	10 (29%)	2 (6%)	3 (9%)	8 (24%)	9 (26%)	0 (0%)
7	10 (29%)	5 (15%)	4 (12%)	0 (0%)	2 (6%)	1 (3%)	10 (29%)	2 (6%)
8	7 (21%)	0 (0%)	1 (3%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	26 (76%)