

AllegianceMD Software Inc.

Safety-Enhanced Design

EHR Usability Test Report for Veracity: V-9.1

Report based on the NISTIR 7741 NIST Guide to the Processes Approach for Improving the Usability of Electronic Health Records, November 2010, and reported in NISTIR 7742 Customized Common Industry Format Template for Electronic Health Record Usability Testing, November 2010.

EHR Under Test: Veracity: V-9.1 by AllegianceMD Software Inc.
Usability Test Period: June 17th 2019 - June 27th 2019
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The Veracity: V-9.1 program is a web-based EHR program accessed online at <https://veracity.allegiancemd.com>

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Executive Summary

AllegianceMD's user-centered design (UCD) process follows the NISTIR 7741 usability design standard. A Usability Test of the AllegianceMD software Inc. EHR program, Veracity: V-9.1, was conducted between 6/17/2019 and 6/27/2019. The test was based on the NISTIR 7742 Customized Common Industry Format template and performed online from the AllegianceMD engineering and support office located in Tulsa, Oklahoma. Testing was moderated by trained AllegianceMD staff that connected to the test participant's own computers.

The purpose of this study was to test and validate the usability of the current user interface, and provide evidence of usability in the Veracity: V-9.1 EHR program. During the usability test, 12 healthcare workers matching the target demographic criteria served as participants, and used the Veracity: V-9.1 EHR program in simulated, but representative tasks. AllegianceMD's target demographic for testing was typical Veracity EHR users.

This study collected performance data on one or more of the following task categories, typically conducted in conjunction with the requirements set forth in ONC's 2015 Final Rule Standard §170.315(g)(3) Safety-enhanced design:¹

- § 170.315 (a)(1) **Computerized Provider Order Entry (CPOE) – medications**
- § 170.315 (a)(2) **CPOE – laboratory**
- § 170.315 (a)(3) **CPOE – diagnostic imaging**
- § 170.315 (a)(4) **Drug-drug, Drug-allergy Interaction Checks for CPOE**
- § 170.315 (a)(5) **Demographics**
- § 170.315 (a)(6) **Problem List**
- § 170.315 (a)(7) **Medication List**
- § 170.315 (a)(8) **Medication Allergy List**
- § 170.315 (a)(9) **Clinical Decision Support**
- § 170.315 (a)(14) **Implantable Device List**
- § 170.315 (b)(2) **Clinical Information Reconciliation and Incorporation**
- § 170.315 (b)(3) **Electronic Prescribing**

Each task category is represented here as a separate section. During the one hour test session, each participant was greeted by the test moderator (administrator) and given a brief overview of what to expect; they were instructed that they could withdraw at any time.

Participants represented a sample of both experienced (over 1 year) and novice (under 1 year) Veracity EHR users. All participants had gone through the standard AllegianceMD - Veracity: V-9.1 EHR program online training sessions previously. The administrator introduced the test, and instructed participants to complete a series of tasks (given one at a time) using the Veracity: V-9.1 EHR program. During the testing, the moderators assistant (note taker) timed the test and recorded user performance data. Assistance involving the actual test was not allowed. However, if a moderator gave non-test related assistance to the user, this was noted on the efficiency section data sheet.

The following types of data were collected for each participant:

- **Task Efficiency**
- **Time to complete the tasks**
- **Task Effectiveness**
- **Task Satisfaction**
- **Participant's verbalization's**

All participant data was de-identified – no correspondence could be made from the identity of the participant to the data collected. Data was collected and metrics calculated as proposed in the NISTIR 7741 NIST Guide to the Processes Approach for Improving the Usability of Electronic Health Records, November 2010. A general summary of the results is shown below in the **Table 1: Summary of Results**.

As a post-test questionnaire, the System Usability Scale (SUS) was given to all the participants at the end of the study. This allowed for an overall satisfaction score comparable to other EHRs. The overall mean score of the SUS was 84.57. This positions Veracity: V-9.1 above the 80 point mark for high usability.² This shows AllegianceMD is on track in the usability of our system. Comments about AllegianceMD's - Veracity EHR program overall were also gathered here.

¹ This certification criterion is from the Health Information Technology: Standards, Implementation Specifications, and Certification Criteria for Electronic Health Record Technology, 2015 Edition Health Information Technology (Health IT) Certification Criteria, 2015 Edition Base Electronic Health Record (EHR) Definition, and ONC Health IT Certification Program Modifications. Final rule. Office of the National Coordinator for Health Information Technology (ONC), Department of Health and Human Services (HHS) October 16 2015

Table 1: Summary of Results

System Usability Score: 84.57%

Where broadly interpreted, scores under 60.00% represent systems with poor usability; scores over 80.00% would be considered above average.²

Summary of Task 1: Electronically Enter an electronic prescription order										
Total Tested	Task Success %	Task Failures %	Task Path Optimal/Observed MEAN	Task Path (SD)	Task Time Optimal/Observed MEAN	Task Time (SD)	Moderator Task Rating MEAN	Participant Task Rating MEAN	Participant Task Rating (SD)	
10	100%	0%	11/13	4	46/68	21	3.5	4.4	0.8	
Summary of Task 2: Electronically Change an electronic prescription order										
Total Tested	Task Success %	Task Failures %	Task Path Optimal/Observed MEAN	Task Path (SD)	Task Time Optimal/Observed MEAN	Task Time (SD)	Moderator Task Rating MEAN	Participant Task Rating MEAN	Participant Task Rating (SD)	
10	100%	0%	4/6	3	12/20	9	3.5	4.9	0.3	
Summary of Task 3: Electronically Send an electronic prescription order										
Total Tested	Task Success %	Task Failures %	Task Path Optimal/Observed MEAN	Task Path (SD)	Task Time Optimal/Observed MEAN	Task Time (SD)	Moderator Task Rating MEAN	Participant Task Rating MEAN	Participant Task Rating (SD)	
10	100%	0%	3/4	1	6/11	15	4.5	5.0	0.0	
Summary of Task 4: Electronically Enter Lab Order										
Total Tested	Task Success %	Task Failures %	Task Path Optimal/Observed MEAN	Task Path (SD)	Task Time Optimal/Observed MEAN	Task Time (SD)	Moderator Task Rating MEAN	Participant Task Rating MEAN	Participant Task Rating (SD)	
12	100%	0%	8/9	2	18/23	6	4.0	4.9	0.3	
Summary of Task 5: Electronically Change Lab Order										
Total Tested	Task Success %	Task Failures %	Task Path Optimal/Observed MEAN	Task Path (SD)	Task Time Optimal/Observed MEAN	Task Time (SD)	Moderator Task Rating MEAN	Participant Task Rating MEAN	Participant Task Rating (SD)	
12	100%	0%	3/6	4	6/17	18	3.5	4.6	0.9	
Summary of Task 6: Electronically Send Lab Order										
Total Tested	Task Success %	Task Failures %	Task Path Optimal/Observed MEAN	Task Path (SD)	Task Time Optimal/Observed MEAN	Task Time (SD)	Moderator Task Rating MEAN	Participant Task Rating MEAN	Participant Task Rating (SD)	
12	100%	0%	3/5	1	7/9	4	4.08	4.7	0.6	
Summary of Task 7: Electronically Enter Imaging Order										
Total Tested	Task Success %	Task Failures %	Task Path Optimal/Observed MEAN	Task Path (SD)	Task Time Optimal/Observed MEAN	Task Time (SD)	Moderator Task Rating MEAN	Participant Task Rating MEAN	Participant Task Rating (SD)	
12	100%	0%	7/9	2	16/21	8	4.0	4.7	0.6	
Summary of Task 8: Electronically Change Imaging Order										
Total Tested	Task Success %	Task Failures %	Task Path Optimal/Observed MEAN	Task Path (SD)	Task Time Optimal/Observed MEAN	Task Time (SD)	Moderator Task Rating MEAN	Participant Task Rating MEAN	Participant Task Rating (SD)	
12	100%	0%	3/6	4	5/12	7	4.08	4.5	0.8	
Summary of Task 9: Electronically Send Imaging Order										
Total Tested	Task Success %	Task Failures %	Task Path Optimal/Observed MEAN	Task Path (SD)	Task Time Optimal/Observed MEAN	Task Time (SD)	Moderator Task Rating MEAN	Participant Task Rating MEAN	Participant Task Rating (SD)	
12	100%	0%	3/4	1	7/10	5	4.16	4.8	0.4	
Summary of Task 10: Manage Drug Interaction/Drug Allergy settings										
Total Tested	Task Success %	Task Failures %	Task Path Optimal/Observed MEAN	Task Path (SD)	Task Time Optimal/Observed MEAN	Task Time (SD)	Moderator Task Rating MEAN	Participant Task Rating MEAN	Participant Task Rating (SD)	
10	100%	0%	5/6	1	14/22	8	3.5	4.5	0.5	
Summary of Task 11: Respond to Triggered Drug Interactions/Drug Allergies										
Total Tested	Task Success %	Task Failures %	Task Path Optimal/Observed MEAN	Task Path (SD)	Task Time Optimal/Observed MEAN	Task Time (SD)	Moderator Task Rating MEAN	Participant Task Rating MEAN	Participant Task Rating (SD)	
10	100%	0%	17/21	3	98/115	13	3.7	4.6	0.7	
Summary of Task 12: Record a patients Sexual Orientation and Gender Identity										
Total Tested	Task Success %	Task Failures %	Task Path Optimal/Observed MEAN	Task Path (SD)	Task Time Optimal/Observed MEAN	Task Time (SD)	Moderator Task Rating MEAN	Participant Task Rating MEAN	Participant Task Rating (SD)	
12	100%	0%	5/5	0	12/14	2	4.33	5.0	0.0	
Summary of Task 13: Record a patients Preferred Name, Race and Ethnicity										
Total Tested	Task Success %	Task Failures %	Task Path Optimal/Observed MEAN	Task Path (SD)	Task Time Optimal/Observed MEAN	Task Time (SD)	Moderator Task Rating MEAN	Participant Task Rating MEAN	Participant Task Rating (SD)	
12	100%	0%	6/7	1	13/16	3	4.16	5.0	0.0	
Summary of Task 14: Record a patients Diagnosis										
Total Tested	Task Success %	Task Failures %	Task Path Optimal/Observed MEAN	Task Path (SD)	Task Time Optimal/Observed MEAN	Task Time (SD)	Moderator Task Rating MEAN	Participant Task Rating MEAN	Participant Task Rating (SD)	
12	100%	0%	5/6	2	9/15	6	3.83	4.8	0.4	
Summary of Task 15: Edit a patients Diagnosis										
Total Tested	Task Success %	Task Failures %	Task Path Optimal/Observed MEAN	Task Path (SD)	Task Time Optimal/Observed MEAN	Task Time (SD)	Moderator Task Rating MEAN	Participant Task Rating MEAN	Participant Task Rating (SD)	
12	100%	0%	6/6	1	8/13	6	4.25	4.9	0.3	

² See Tullis, T. & Albert, W. (2008). Measuring the User Experience. Burlington, MA: Morgan Kaufman (p. 149). Broadly interpreted, scores under 60 represent systems with poor usability; scores over 80 would be considered above average.

Table 1 - continued

Summary of Task 16: Record a patients current Medication									
Total Tested	Task Success %	Task Failures %	Task Path Optimal/Observed MEAN	Task Path (SD)	Task Time Optimal/Observed MEAN	Task Time (SD)	Moderator Task Rating MEAN	Participant Task Rating MEAN	Participant Task Rating (SD)
12	100%	0%	6/9	2	23/38	15	3.33	4.0	0.6
Summary of Task 17: Edit a patients current Medication									
Total Tested	Task Success %	Task Failures %	Task Path Optimal/Observed MEAN	Task Path (SD)	Task Time Optimal/Observed MEAN	Task Time (SD)	Moderator Task Rating MEAN	Participant Task Rating MEAN	Participant Task Rating (SD)
12	100%	0%	4/7	3	11/20	14	3.58	4.3	0.8
Summary of Task 18: Record a patients Drug Allergy									
Total Tested	Task Success %	Task Failures %	Task Path Optimal/Observed MEAN	Task Path (SD)	Task Time Optimal/Observed MEAN	Task Time (SD)	Moderator Task Rating MEAN	Participant Task Rating MEAN	Participant Task Rating (SD)
12	100%	0%	5/6	1	9/11	3	4.25	4.8	0.6
Summary of Task 19: Edit a patients Drug Allergy									
Total Tested	Task Success %	Task Failures %	Task Path Optimal/Observed MEAN	Task Path (SD)	Task Time Optimal/Observed MEAN	Task Time (SD)	Moderator Task Rating MEAN	Participant Task Rating MEAN	Participant Task Rating (SD)
12	100%	0%	3/3	0	5/6	2	4.5	5.0	0.0
Summary of Task 20: Manage the EMR's Clinical Decision Support Settings									
Total Tested	Task Success %	Task Failures %	Task Path Optimal/Observed MEAN	Task Path (SD)	Task Time Optimal/Observed MEAN	Task Time (SD)	Moderator Task Rating MEAN	Participant Task Rating MEAN	Participant Task Rating (SD)
12	100%	0%	6/8	2	27/37	12	3.41	4.4	0.6
Summary of Task 21: Review a patients Clinical Decision Support Information									
Total Tested	Task Success %	Task Failures %	Task Path Optimal/Observed MEAN	Task Path (SD)	Task Time Optimal/Observed MEAN	Task Time (SD)	Moderator Task Rating MEAN	Participant Task Rating MEAN	Participant Task Rating (SD)
12	100%	0%	3/4	1	9/12	3	3.83	4.8	0.4
Summary of Task 22: Record a patients Implantable Device									
Total Tested	Task Success %	Task Failures %	Task Path Optimal/Observed MEAN	Task Path (SD)	Task Time Optimal/Observed MEAN	Task Time (SD)	Moderator Task Rating MEAN	Participant Task Rating MEAN	Participant Task Rating (SD)
12	100%	0%	4/5	1	8/14	4	3.5	4.9	0.3
Summary of Task 23: Upload/Assign a Continuity of Care Document to a patients record									
Total Tested	Task Success %	Task Failures %	Task Path Optimal/Observed MEAN	Task Path (SD)	Task Time Optimal/Observed MEAN	Task Time (SD)	Moderator Task Rating MEAN	Participant Task Rating MEAN	Participant Task Rating (SD)
12	100%	0%	9/11	2	23/34	13	3.58	4.3	0.7
Summary of Task 24: Reconcile and Incorporate a Continuity of Care Document with a patients record									
Total Tested	Task Success %	Task Failures %	Task Path Optimal/Observed MEAN	Task Path (SD)	Task Time Optimal/Observed MEAN	Task Time (SD)	Moderator Task Rating MEAN	Participant Task Rating MEAN	Participant Task Rating (SD)
12	100%	0%	3/5	4	6/12	10	3.75	4.6	0.6
Summary of Task 25: Create and Export a Continuity of Care Document for a patient									
Total Tested	Task Success %	Task Failures %	Task Path Optimal/Observed MEAN	Task Path (SD)	Task Time Optimal/Observed MEAN	Task Time (SD)	Moderator Task Rating MEAN	Participant Task Rating MEAN	Participant Task Rating (SD)
12	100%	0%	6/8	2	14/20	7	3.75	4.8	0.6
Summary of Task 26: Approve an electronic refill									
Total Tested	Task Success %	Task Failures %	Task Path Optimal/Observed MEAN	Task Path (SD)	Task Time Optimal/Observed MEAN	Task Time (SD)	Moderator Task Rating MEAN	Participant Task Rating MEAN	Participant Task Rating (SD)
10	100%	0%	3/4	1	4/7	5	4.1	5.0	0.0
Summary of Task 27: Approve an Incoming generic pharmacy request									
Total Tested	Task Success %	Task Failures %	Task Path Optimal/Observed MEAN	Task Path (SD)	Task Time Optimal/Observed MEAN	Task Time (SD)	Moderator Task Rating MEAN	Participant Task Rating MEAN	Participant Task Rating (SD)
10	100%	0%	5/7	1	9/13	4	3.6	4.7	0.5
Summary of Task 28: Cancel an electronic prescription									
Total Tested	Task Success %	Task Failures %	Task Path Optimal/Observed MEAN	Task Path (SD)	Task Time Optimal/Observed MEAN	Task Time (SD)	Moderator Task Rating MEAN	Participant Task Rating MEAN	Participant Task Rating (SD)
10	100%	0%	3/6	2	5/16	9	3.3	4.4	0.7
Summary of Task 29: Identify Prescription Fill Status									
Total Tested	Task Success %	Task Failures %	Task Path Optimal/Observed MEAN	Task Path (SD)	Task Time Optimal/Observed MEAN	Task Time (SD)	Moderator Task Rating MEAN	Participant Task Rating MEAN	Participant Task Rating (SD)
10	100%	0%	3/4	2	3/9	5	3.6	4.8	0.4
Summary of Task 30: Modify and Approve an incoming therapeutic pharmacy request									
Total Tested	Task Success %	Task Failures %	Task Path Optimal/Observed MEAN	Task Path (SD)	Task Time Optimal/Observed MEAN	Task Time (SD)	Moderator Task Rating MEAN	Participant Task Rating MEAN	Participant Task Rating (SD)
10	100%	0%	9/12	2	13/33	12	2.9	4.1	0.7
Summary of Task 31: Review a patients medication history									
Total Tested	Task Success %	Task Failures %	Task Path Optimal/Observed MEAN	Task Path (SD)	Task Time Optimal/Observed MEAN	Task Time (SD)	Moderator Task Rating MEAN	Participant Task Rating MEAN	Participant Task Rating (SD)
10	100%	0%	3/6	2	4/15	9	3.2	4.8	0.4

Table 1 - continued

Summary of Task 32: Reconcile a patients medication history									
Total Tested	Task Success %	Task Failures %	Task Path Optimal/Observed MEAN	Task Path (SD)	Task Time Optimal/Observed MEAN	Task Time (SD)	Moderator Task Rating MEAN	Participant Task Rating MEAN	Participant Task Rating (SD)
10	100%	0%	4/5	2	7/14	4	3.7	4.8	0.4

Major Findings

The Veracity: V-9.1 EHR program performed as expected.

The only main areas of concern are reducing the click rate for many of the tasks to further improve the ease of use and improve the speed tasks can be completed. Also to improve the search capabilities on the Medications List and the Allergies List as this was the area most users experienced a reduction of efficiency and caused some to deviate from the normal path of task completion. This information was passed on to our engineering department to further investigate.

Introduction

The focus of this usability study is the Veracity: V-9.1 program from AllegianceMD Software Inc., Specifically the EHR portion of the software that was designed as a complete electronic health records system for ambulatory medical practices.

The Veracity: V-9.1 program in addition to being a complete EHR system also incorporates Scheduling, Medical Billing and Practice Management functions all in one seamless design. The study was conducted utilizing intended users of the Veracity: V-9.1 program (Medical Professionals: Doctors, Nurses, Physician Assistants and Medical Assistants, Practice Administrators...)

The purpose of this testing is to test and validate the Veracity: V-9.1 programs EHR user interface for usability and to provide evidence of said usability as required to meet the guidelines as set forth by ONC's 2015 Final Rule Standard §170.315(g)(3) Safety-enhanced design. AllegianceMD has attempted to provide the users performing the tests with as realistic a set of exercises and conditions as possible. To this end, measures of efficiency, effectiveness, and user satisfaction were captured during the usability testing for the following task modules:

- § 170.315 (a)(1) Computerized Provider Order Entry (CPOE) – medications
- § 170.315 (a)(2) CPOE – laboratory
- § 170.315 (a)(3) CPOE – diagnostic imaging
- § 170.315 (a)(4) Drug-drug, Drug-allergy Interaction Checks for CPOE
- § 170.315 (a)(5) Demographics
- § 170.315 (a)(6) Problem List
- § 170.315 (a)(7) Medication List
- § 170.315 (a)(8) Medication Allergy List
- § 170.315 (a)(9) Clinical Decision Support
- § 170.315 (a)(14) Implantable Device List
- § 170.315 (b)(2) Clinical Information Reconciliation and Incorporation
- § 170.315 (b)(3) Electronic Prescribing

Each of these modules were tested according to their ONC Final Rule Standard, 2015 Edition Health Information Technology (Health IT) Certification Criteria.

Method

Participants

A total of 12 users participated in the testing of the Veracity: V-9.1 program. The participants in the test were typical users of the Veracity EHR and on average had just under 3.4 years experience using the AllegianceMD - Veracity EHR program. Some were newer users just having started to utilize the program within the last year, while others were quite experienced users having utilized the Veracity EHR for 5 years or more. All users had previous EMR training on the Veracity EHR program and advanced supplemental training for tested components not yet released.

The names of the users participating in the testing were replaced with Participant ID's (ID#), so that an individual's data cannot be tied back to individual identities. A total of 13 participants accepted invitations to participate and 12 kept their scheduled appointment to test the system and the 13th was unable to participate due to unexpected work load.

Users that elected to participate in the testing ranged in age from their 20's to 50's with average being in the 30-39 age range. Users tended to feel that they had at least a moderate knowledge of the computer systems and the software being utilized in the practice and all felt that "a lack of training" would not be an issue. There was a 3 to 9 split between male and female users, and a majority of participants were provider support staff. The specialties of the practices varied from General Family Medicine and Pediatrics to quite specialized such as Endocrinology and Orthopedics.

No users participating in the testing had any direct connection to the development of the Veracity EHR program or had any involvement with any organization producing any of the Veracity EHR program's functions. Likewise no user participants were from a testing or supplier organization.

Following the study, AllegianceMD mailed each participant a \$50.00 Amazon gift card as compensation for their time.

A breakdown of the demographics of the participants is shown below in **Table 2: Demographic Summary Chart**.

Table 2: Demographic Summary Chart

ID#	Practice Specialty	State	Gender	Age Range	Education	Occupational Role	Months using Computers*	Months in Healthcare* using a EHR*	Months using Veracity*	Use Assistive Tech	
1	Family Medicine	WA	Female	20-29	12 Month Cert.	Medical Assistant	264	84	84	14	No
2	Otolaryngology	NH	Female	20-29	Associates	Medical Assistant	252	72	60	21	No
3	Endocrinology	MI	Female	50-59	High School	Practice Administrator	276	216	75	75	No
4	Pain Management	CA	Female	30-39	12 Month Cert.	Medical Assistant	264	90	90	18	No
5	Pediatrics	AZ	Female	40-49	Masters	Nurse Practitioner	396	216	132	69	No
6	OB/GYN	CA	Female	50-59	Bachelors	Nurse	312	264	120	48	No
7	Psychiatry	IL	Female	30-39	Associates	Medical Assistant	372	96	96	9	No
8	Neurology	LA	Male	20-29	Associates	Medical Assistant	288	84	78	27	No
9	Pain Management	CA	Male	30-39	Bachelors	Nurse	300	96	96	84	No
10	OB/GYN	FL	Female	30-39	Masters	Physicians Assistant	336	144	63	10	No
11	Sports Medicine	IA	Male	30-39	Associates	Nurse	360	204	51	51	No
12	Orthopedics	CA	Female	30-39	Associates	Medical Assistant	288	60	60	60	No

* Note: For the questions involving time frame's in months many of the responses given where in "years" or "since the age of" - We multiplied the estimated number of years by 12 to arrive at a monthly number.

Study Design

The process was based on the NISTIR 7741 NIST Guide to the Processes Approach for Improving the Usability of Electronic Health Records, November 2010 by Robert M. Schumacher and Svetlana Z. Lowry. Overall, the objective of this test was to uncover areas where the software performed efficiently, effectively, and with a high degree of satisfaction; and areas where the application failed to meet the needs of the participants. The data from these tests may serve as a baseline for future tests with an updated version of the same EHR and/or comparison with other EHRs, provided the same tasks are used. In short, this testing serves as both a means to record or benchmark current usability, but also to identify areas where improvements must be made.

Participants were scheduled for one session of approximately 90 minutes. All 12 participants were given the option to perform all tasks and given the option to decline a set of tasks if they were outside their scope of day to day use.

All tests were kept within the overall time allowed, typically 90 minutes. An Excel document was used to keep track of the participants scheduled and the task modules that were completed.

During the usability test, participants interacted with only the Veracity: V-9.1 program. Each participant used the system by connecting with the test moderator through a webinar (AllegianceMD uses Zoom by Zoom Video Communications, Inc.) and was provided with the same instructions. The system was evaluated for efficiency, effectiveness, and satisfaction, as defined by the following measures, Data for each was collected and analyzed for each test participant:

- Time to complete the tasks
- If the task was completed and without assistance
- Number and types of errors and/or Task Path
- Participant's satisfaction ratings of the system
- Participant's verbalization's

At the end of the test session, the user was also asked to respond to generalized statements on the Veracity: V-9.1 program's usability using the SUS scale, see Data Scoring below for further details.

Tasks

A total of 12 test categories each incorporating 1 or more specific tasks for a total of 32 individual tasks. Each task was constructed to be realistic and representative of the kinds of activities a user might do with this EHR. Each task's instructions are listed on the results table for each task.

- **§ 170.315 (a)(1) Computerized Provider Order Entry (CPOE) – medications**
 - I. Electronically Enter an electronic prescription order
 - II. Electronically Change an electronic prescription order
 - III. Electronically Send an electronic prescription order
- **§ 170.315 (a)(2) CPOE – laboratory**
 - I. Electronically Enter Lab Order
 - II. Electronically Change Lab Order
 - III. Electronically Send Lab Order
- **§ 170.315 (a)(3) CPOE – diagnostic imaging**
 - I. Electronically Enter Imaging Order
 - II. Electronically Change Imaging Order
 - III. Electronically Send Imaging Order
- **§ 170.315 (a)(4) Drug-drug, Drug-allergy Interaction Checks for CPOE**
 - I. Manage Drug Interaction/Drug Allergy settings
 - II. Respond to Triggered Drug Interactions/Drug Allergies
- **§ 170.315 (a)(5) Demographics**
 - I. Record a patients Sexual Orientation and Gender Identity
 - II. Record a patients Preferred Name, Race and Ethnicity
- **§ 170.315 (a)(6) Problem List**
 - I. Record a patients Diagnosis
 - II. Edit a patients Diagnosis
- **§ 170.315 (a)(7) Medication List**
 - I. Record a patients current Medication
 - II. Edit a patients current Medication
- **§ 170.315 (a)(8) Medication Allergy List**
 - I. Record a patients Drug Allergy
 - II. Edit a patients Drug Allergy
- **§ 170.315 (a)(9) Clinical Decision Support**
 - I. Manage the EMR's Clinical Decision Support Settings
 - II. Review a patients Clinical Decision Support Information
- **§ 170.315 (a)(14) Implantable Device List**
 - I. Record a patients Implantable Device
- **§ 170.315 (b)(2) Clinical Information Reconciliation and Incorporation**
 - I. Upload/Assign a Continuity of Care Document to a patients record
 - II. Reconcile and Incorporate a Continuity of Care Document with a patients record
 - III. Create and Export a Continuity of Care Document for a patient
- **§ 170.315 (b)(3) Electronic Prescribing**
 - I. Approve an electronic refill
 - II. Approve an Incoming generic pharmacy request
 - III. Cancel an electronic prescription
 - IV. Identify Prescription Fill Status
 - V. Modify and Approve an incoming therapeutic pharmacy request
 - VI. Review a patients medication history
 - VII. Reconcile a patients medication history

Procedures

Online Procedures

Upon reaching the participant over the phone, their identity was verified and matched with the name of the participant scheduled. The participants were given an account login and password to reach a per-configured AllegianceMD - Veracity: V-9.1 EHR program account. This account allowed the user to access functions that have not yet been released in the current pretest Veracity EHR program.

The participants were typically asked to respond to the Introduction/Demographics section, the 12 test sections, and the Closing section. For each task, the participants were given a digital summary of the task that we recommended that they print out for easy reference. During the 12 test sections the participant was often asked to find something in the EHR, to add something to the EHR, and/or to change something in the EHR. These tests are reflective of the tasks used for the 2015 EHR Certification and Meaningful Use standards.

After the tasks were complete, the participant was asked to complete the SUS Survey in the Closing section. The user Participants demographic information (De-Identified) , task success rates, times, errors, deviations, and verbal responses, and the post-test questionnaire were then recorded into a master spreadsheet that was used to compile all the testing data.

Test Location

The testing was conducted online by a test moderator in the AllegianceMD engineering and support office located in Tulsa, Oklahoma. As noted above in the study design the moderator at the beginning of the call connected with the user participants computer utilizing Zoom by Zoom Video Communications, Inc. The exact location of the participant was not noted, but it was assumed it was a typical location that was comfortable for the user, and where he/she did most of their daily work with the EHR program. This test procedure is very familiar to most of the participants, as AllegianceMD conducts extensive online training in this manner and customer support will frequently help users also utilizing the Zoom webinar program.

Test Environment

The Veracity: V-9.1 EHR program would typically be used in a healthcare office or facility. The online testing participants used their own computers, as AllegianceMD's - Veracity EHR program is a web-based program. It is assumed, since the participants were able to access their accounts, that they were meeting the basic minimum system requirements to use an online program.

Technically, the system performance (i.e., response time) was representative to what actual users would experience in a live implementation. Test moderators were instructed to note any problems encountered, if any, during the testing. No extraordinary performance issues were noted.

Test Forms and Tools

During the usability test, various documents and instruments were utilized including:

- Testing Script.
- Introduction & Demographic section.
- Sample CCDA file for testing
- The test module(s) sections.
- Post-test (SUS) questionnaire and Closing section.
- Test Administrators' timer.
- Zoom webinar program to connect to users computer.

Participant Instructions

Introduction Script

The administrator reads the following introductory instructions aloud to each participant:

Thank you for participating in this study. Your input is very important. Our total session today will last about 90 minutes. During that time you will use an instance of AllegianceMD's - Veracity: V-9.1 electronic health record program. Overall, we are interested in how easy, or how difficult, certain functions in this system are to use and what in it would be useful to you as a provider/user. The goal of this testing is not to test you as a user or pat ourselves on the back but to learn from your performance on how we could improve it. Please be honest with your opinions. All of the information that you provide will be kept confidential, and your name will not be associated with your comments at any time.

We realize you are helping us; should you feel it necessary, you are able to withdraw at any time during the testing, for any reason.

So lets begin:

First off – did you print off the Key Data Points sheet I e-mailed over to you? (if not have them print it) I sent that over so you can have that handy while testing to make things move along quicker for you. Likewise if you have not done so please download the attached sample CCDA file as we will be needing that later on during the testing.

There are two steps I need from you to start, if you are willing. One is to open a web browser, and go to Zoom.us so we can get connected to your computer just like you do during training and support calls. You can do that now.

Go ahead click join a meeting and enter the following access code (Generated at time of call) and enter your initials in the name field then click join. Just a reminder that if you have not accessed Zoom on this computer you will be asked to download the app for it. Just follow the prompts.

I now see we are connected, Now go ahead and share your screen. Great now we are on the same screen.

Now for step two, I will now walk you through getting logged into the Veracity: V-9.1 EHR testing account. (Provide testing account address, ACT #, User and password)

For this first part of the study, we need to gather some non-identifying demographic data. Please keep in mind that any identifying information given during the testing will be scrubbed and replaced with with a generic code. Nothing can be traced back to you or the practice.

Should you feel it necessary you are able to withdraw at any time during the testing.

Demographics were collected next utilizing the demographics questionnaire and the demographics answer sheet.

Demographics Questionnaire - All the blanks need to be filled. Where possible, use numeric codes to facilitate data collection. If you cannot use a code, or feel a code is inappropriate, then write in a response. Use N/A (not available) only if no other options are available. Capture any pertinent comments and/or questions in the notes section.

Demographic Questions:

1. Participant ID: Use Month/Day/Year/Hour (MM/DD/YYYY/HH) _____
This is only a unique control identifier so as to keep track of the paperwork
2. Test Date: _____
3. Test Time: (now) _____
4. Test Administrator: _____
5. Location of tester: _____
6. State of participant: _____
7. Occupation: (Use Numbers) Provider, Dr./PA/NP-1, Medical Assistant/Tech-2, Admin-3, Other-4: _____ (if other: _____)
8. Specialty of Practice: _____
9. Gender: ____ (M or F)
10. Age: _____

Experience: Have the participant self report. If there seems to be a discrepancy, add to notes section.

NOTE: Years to be converted to months later for reporting by multiplying by 12.

11. Years of computer experience – How many years has the participant been regularly using computers? _____
12. Years of healthcare experience - How many years has the participant been working in healthcare? _____
13. Years of EMR experience - How many years has the participant been working with EMR programs? _____
14. Years of experience with AllegianceMD's Veracity EMR - How many years has the participant been working with AllegianceMD's Veracity EMR program? _____
15. Use of any assistive technology, Does the participant require the use of any additional program or device that without they would be unable to utilize the Veracity EMR program? _____ If Yes, What are those devices: _____

Now, In just a moment I will be asking you to complete a few tasks using this system, and then answer some questions about what you just did. You should complete the tasks as quickly as possible, making as few errors as possible. Please try to complete the tasks on your own to the best of your ability, following the instructions very closely. Each task has a corresponding Key Data Points list on the sheet I had you print out. You may find it helpful as it summarizes each section. Please note that we are not testing you specifically, we are testing the system, therefore, if you have difficulty, all this means is that something needs to be improved in the system. I will be here in case you need specific help, but I am not able to instruct you or provide help in how to use the application. If one of the sets of tasks is outside your regular use of the system you may either opt out of that task set or if you choose you may continue and attempt the task set.

For each task, I will read the description to you and say, "Begin." At that point, please perform the task and say, "Done", once you believe you have successfully completed the task. I would like to request that you try not to talk aloud or verbalize while you are doing the tasks. Once finished with the task I will then ask you your impressions about the task you just performed. During these tasks, I may take your comments and refocus them to the task on hand. When all the tasks are complete, ALL comments and questions can be taken regarding ANY part of the Veracity EHR program's functions.

Any questions so far?

Participants were then given 12 sets of task scenarios totaling 32 individual tasks to complete. Testing scenarios were designed based off the Health Information Technology: Standards, Implementation Specifications, and Certification Criteria for Electronic Health Record Technology, 2015 Edition Health Information Technology (Health IT) Certification Criteria.

Task Set	Number	Task	Task Instructions
§ 170.315 (a)(1) Computerized provider order entry (CPOE) – medications	1	Create eRx Order	Starting on Patients demographics tab - Order a prescription for (LevoFloxacin– Tablet - 500 mg – 1 po qday – Oral – Quantity 15 days 15) and save.
	2	Edit eRx Order	Starting on Patients Medications tab - Edit the prescription to (LevoFloxacin– Tablet - 500 mg – 1 po qday – Oral – Quantity 10 days 10) save
	3	Send eRx	Starting on Patients Medications tab – Send the prescription.
§ 170.315 (a)(2) Computerized provider order entry (CPOE) – laboratory	4	Create Lab Order	Starting on Patients demographics tab – Place the following lab order (Strep Screen, Rapid with Diagnosis J02.0) save.
	5	Edit Lab Order	Starting on Patients Summary tab - Edit Lab order by marking the Order STAT.
	6	Send Order Electronically	Starting on Patients Summary tab – Send electronically the Lab Order.
§ 170.315 (a)(3) Computerized provider order entry (CPOE) – diagnostic imaging	7	Create Imaging Order	Starting on Patients demographics tab – Place the following imaging order (Wrist Left 2 Views) save.
	8	Edit Imaging Order	Starting on Patients Summary tab - Edit Imaging order from Bill Insurance to Client Bill.
	9	Send Order Electronically	Starting on Patients Summary tab – Send electronically the Imaging Order.
§ 170.315 (a)(4) Drug-drug, drug-allergy interaction checks for CPOE	10	Manage interaction and allergy settings	Starting from Home Screen – Change the Drug-drug, drug-allergy alert settings to Severe.
	11	Respond to Drug interactions and allergies	Starting on Patients demographics tab - Order a prescription for (Penicillin V Potassium– Tablet - 250 mg – 1 po qday – Oral – Quantity 10 days 10), Alert warning for severe reaction should trigger, Amend prescription to (Levaquin - 500 mg – 1 po qday – Oral – Quantity 7 days 7)
§ 170.315 (a)(5) Demographics	12	Record the sexual orientation and gender identity	Starting from home screen - record the sexual orientation and gender identity for the your assigned testing patient – (Patient Identifies as Straight, and Identifies as Female)
	12	Record preferred name and race and ethnicity	Starting from home screen - record preferred name and race and ethnicity – (Preferred name: Nicki – Race: White – Ethnicity: Hispanic or Latino)
§ 170.315 (a)(6) Problem list	14	Record diagnosis	Starting on Patients demographics tab – Add a diagnosis to the active problem list – (Acute pharyngitis, unspecified J02.9).
	15	Change diagnosis	Starting on Patients Summary tab - Change diagnosis of Acute pharyngitis, unspecified J02.9 on the active problem list to - (Streptococcal pharyngitis J02.0)
§ 170.315 (a)(7) Medication list	16	Record a medication	Starting on Patients demographics tab - Record a medication (Albuterol 2 mg tablet 3 times a day) to active medications list.
	17	Edit a medication	Starting on Patients Medications tab - Edit a active medication (Cortisone Acetate 25 MG Tablet) – (Stop the med) and add note (Ran course)
8	18	Add drug allergy	Starting on Patients demographics tab – Add a Drug Allergy (Penicillin) with (Start Date 01/01/2000 - Symptoms Skin Rash, Hives)

§ 170.315 (a)(8) Medication allergy list	19	Edit drug allergy	Starting on Patients Summary tab – Edit patients Drug Allergy (IODINE) – (Add: WARNING)
	9	Manage CDS settings	Starting from home screen - Add a clinical decision support reminder for the following (I10 Essential (primary) hypertension - BP check – recurring every 30 days)
§ 170.315 (a)(9) Clinical decision support (CDS)	20		
	21	Review CDS Info resource	Starting on Patients demographics tab – Review the patients Clinical Decision Support alerts and unsubscribe the patient from the monthly BP check.
§ 170.315 (b)(2) Clinical information reconciliation and incorporation	10	Assign continuity of care document	Starting from the Patients Demographics tab and Using the sample CCDA file provided – Assign and upload the sample CCDA to the patient account – proceed to step 2
	22		
	23	Reconcile and incorporate continuity of care document	(CCDA Step 2) Once CCDA is uploaded (Step 1) – Select (Medications, Allergies and Problems) from the CCDA to be incorporated in the patients account and incorporate.
§ 170.315 (a)(14) Implantable device list	24	Create continuity of care document	Starting from the Patients Demographics tab – Create a CCDA file for all the patients encounter dates.
	11	Record implantable device	Starting on Patients demographics tab - Record the following implantable device (00850540007126 - Impulse 7000DP pacemaker)
§ 170.315 (b)(3) Electronic prescribing	25		
	26	Approve an electronic refill	Starting from the Patients medications tab – Approve the prescription refill request for (Phenergan 25 MG/1 ML Solution 5 mg po q6 hrs prn nausea) and send electronically.
	27	Approve an incoming generic pharmacy request	Starting from the Patients medications tab – Review the first pharmacy change request and approve it.
	28	Cancel an electronic prescription	Starting from the Patients medications tab – Cancel the electronic prescription for (Phenergan 25 MG/1 ML Solution 5 mg po q6 hrs prn nausea) and send electronically.
	29	Identify prescription fill status	Starting from the Patients medications tab – Identify the fill status for any one of the prescribed medications.
	30	Modify and approve an incoming therapeutic pharmacy request	Starting from the Patients medications tab – Review the second pharmacy change request and change the the SIG Quantity and Days to the following (Quantity: 10 – Days: 10) and send.
	31	Review medication history	Starting from the Patients Demographics tab – Review the patients medication history.
	32	Reconcile medication history	Starting from the Patients medications tab – Change the active prescription status for (ADVAIR) to no longer active.

After each task the following was filled out:

- The task was completed successfully?: _____ (Y or N)
- Number of clicks to complete the task _____
- Time in seconds, to complete task _____
- Administrator rated the efficiency of the participant’s task performance _____.
 - 1 = Could not complete Task.
 - 2 = Went over Both allotted clicks and allotted time but completed task.
 - 3 = Went over either the allotted clicks or allotted time but completed task.
 - 4 = Completed task within both the allotted clicks and allotted time.
 - 5 = Completed task with within the BASE clicks and time or less.

Then the participant was asked to rate the task according to the Satisfaction scale – 1-5 with 1 being the hardest to 5 being the easiest:_____.

Thank you for testing that. I have one more question regarding the task.

How would you rate the ability to do (the task just performed) on a five point scale where 1 is very difficult, 3 being average, and 5 is very easy?_____

Then the participant was asked if they had questions, comments or suggestions regarding the task just performed and those of significance where noted. Likewise the test administrator also made notes when warranted based off observations.

Do you have any other questions, comments or suggestions related to this task?

If not...

Let’s move on to the next step.

Once all Testing Scenarios had been completed the Criticalness Survey and SUS Survey was filled out with the participant:

SUS Survey

For the following questions answer with 1,2,3,4,or 5 . All are based on a five point scale, where a 1 is, "You strongly disagree with the statement," to 5 where, "You strongly agree with the statement." Do not dwell too long on a statement, and give us your initial impression. No opinion or "can't respond" would rate a 3 on the scale.

- I think that I would like to use this System frequently.
- I found the system unnecessarily complex.
- I thought the system was easy to use.
- I think that I would need the support of a technical person to be able to use this system.
- I found the various functions in this system were well integrated.
- I thought there was too much inconsistency in this system.
- I would imagine that most people would learn to use this system very quickly
- I found the system very cumbersome to use.
- I felt very confident using the system.
- I needed to learn a lot of things before I could get going with this system.

Criticalness Survey

Please rate the following 12 EHR functions for the following:

- The frequency users utilize the function within the system: Answer between 1 and 7 with 1= Most used and 7 = Least used.
- and
- The risk associated with user errors in utilizing the function: Answer between 1 and 7 with 1= Most risk of a user making a serious error and 7 = Least risk of a user making a serious error.

1. CPOE – medications: Frequency _____, User Error Risk _____
2. CPOE – laboratory: Frequency _____, User Error Risk _____
3. CPOE – diagnostic imaging: Frequency _____, User Error Risk _____
4. Drug-drug, Drug-allergy Interaction Checks for CPOE: Frequency _____, User Error Risk _____
5. Demographics: Frequency _____, User Error Risk _____
6. Problem List: Frequency _____, User Error Risk _____
7. Medication List: Frequency _____, User Error Risk _____
8. Medication Allergy List: Frequency _____, User Error Risk _____
9. Clinical Decision Support: Frequency _____, User Error Risk _____
10. Implantable Device List: Frequency _____, User Error Risk _____
11. Clinical Information Reconciliation and Incorporation: Frequency _____, User Error Risk _____
12. Electronic Prescribing: Frequency _____, User Error Risk _____

Usability Metrics

According to the NISTIR 7741 NIST Guide to the Processes Approach for Improving the Usability of Electronic Health Records, November 2010, EHRs should support a process that provides a high level of usability for all users. The goal is for users to interact with the system efficiently, effectively, and with an acceptable level of satisfaction.

To this end, metrics for efficiency, effectiveness, and user satisfaction were captured during the usability testing.

The goals of the test were to assess:

1. Efficiency of the Veracity: V-9.1 EHR program by measuring the average task time and path efficiency.
2. Effectiveness of the Veracity: V-9.1 EHR program by measuring participant success rates.
3. Satisfaction with the Veracity: V-9.1 EHR program by measuring ease of use ratings.

Data Scoring

The following 3 tables outline how data was collected for tasks, how tasks were scored, how errors were evaluated, and how the time data was analyzed.

Demographics Calculations Table					
Data	Format	Parameters	Notes	Calculation Type	
Participant ID	Number	Unique Number	Month/Day/Year/Hour/Minute MM/DD/YY/HH/MM	None/a Control	
Test Date	Number	Date	Month/Day/Year MM/DD/YYYY	None/a Control	
Test Time	Number	Time	Hour/Minute HH/MM	Mean time for completion	
Test Moderator	Text	Name	NONE	None/a Control	
Location of Participant	Text	Text	NONE	None/a Control	
State of Participant	Text	Text	NONE	Frequency	
Occupation	Number	1,2,3,4	1-Provider (Dr., PA, NP), 2-Medical Assistant/Tech, 3-Admin and 4-Other	Frequency	
Specialty	Text	None	NONE	Frequency	
Gender	Text	M or F	NONE	Ratio	
Age	Number	Years	All years converted to months by multiplying by 12	Mean Age	
Computer experience	Number	Years	All years converted to months by multiplying by 12	Mean years	
Time in Health Care	Number	Years	All years converted to months by multiplying by 12	Mean years	
EMR experience	Number	Years	All years converted to months by multiplying by 12	Mean years	
Veracity EMR experience	Number	Years	All years converted to months by multiplying by 12	Mean years	

- Standard Deviation (SD) calculation:**
- 1 – Add numbers in column and divide by total testers = MEAN
 - 2 – Subtract MEAN from each number in column then square the difference = Difference2
 - 3 - Add the Differences2 and divide by the total testers = Variance
 - 4 – Obtain the square root of the Variance = Standard Deviation (SD)

Task Calculations Table						
Data	Format	Parameters	Notes	Calculation Type	Equation Notes	
Task Success	Text	Yes or No	Y = Yes – N = NO	Sum	NONE	
Task Fail	Text	Yes or No	Y = Yes – N = NO	Sum	NONE	
Base Task Path	Number	Click Rate	Base Task Path predetermined by training/support department pretesting to determine optimal Path. This is the Base. An Allotted path was then determined by the following - Base 1-5, +1, Base 6-10 +2, Base 11-15 +3, Base 16-20 +4. The allotted base is to account for minor user preferences and possible unfamiliarity.	Base and Allotted Mean	NONE	
Task Path	Number	Click Rate	The number of clicks for the tester to complete the task.	Mean	Observed number of clicks	
Base Task Time	Number	Time (seconds)	Base Task Time predetermined by training/support department pretesting to determine optimal time in seconds. This is the Base. An Allotted time was then determined by the following - Base 1-60 + 15, Base 61-120 + 30, Base 121-180 + 45, all Rounded up to the next 15 second increment. The allotted time is to account for minor user preferences and possible unfamiliarity.	Base and Allotted Mean	NONE	
Task Time	Number	Time (seconds)	The number of seconds for the tester to complete the task.	Mean	Observed Task Time	
Efficiency Task Rating	Number	1,2,3,4, or 5	Moderator rates the efficiency of the participant's paths used using a 5 point scale where 1 = Could not complete Task. 2 = Went over Both allotted clicks and allotted time but completed task. 3 = Went over either the allotted clicks or allotted time but completed task. 4 = Completed task within both the allotted clicks and allotted time. 5 = Completed task with within the BASE clicks and time or less.	Mean	NONE	
Satisfaction Task Rating	Number	1,2,3,4, or 5	Tester rates the Task on a 5 point scale with 1 being very difficult, 3 being average, and 5 being very easy	Mean	NONE	
Comments/Notes	Text	NONE	NONE	NONE	NONE	

SUS Calculations Table					
Statement Data	Format	Parameters	Notes	Calculation Type	Equation Notes

1. I think that I would like to use this system frequently	Number	1,2,3,4,or 5	Measured on a five point agreement scale, where a 1 is strongly in disagreement with that statement to 5 strongly agreeing with that statement	custom	Scale - 1
2. I found the system unnecessarily complex	Number	1,2,3,4,or 5	Measured on a five point agreement scale, where a 1 is strongly in disagreement with that statement to 5 strongly agreeing with that statement	custom	Scale - 5
3. I thought the system was easy to use	Number	1,2,3,4,or 5	Measured on a five point agreement scale, where a 1 is strongly in disagreement with that statement to 5 strongly agreeing with that statement	custom	Scale - 1
4. I think I would need the support of a technical person to use this system	Number	1,2,3,4,or 5	Measured on a five point agreement scale, where a 1 is strongly in disagreement with that statement to 5 strongly agreeing with that statement	custom	Scale - 5
5. I found the various functions in this system were well integrated	Number	1,2,3,4,or 5	Measured on a five point agreement scale, where a 1 is strongly in disagreement with that statement to 5 strongly agreeing with that statement	custom	Scale - 1
6. I thought there was too much inconsistency in this system	Number	1,2,3,4,or 5	Measured on a five point agreement scale, where a 1 is strongly in disagreement with that statement to 5 strongly agreeing with that statement	custom	Scale - 5
7. I would imagine that most people would learn to use this system very quickly	Number	1,2,3,4,or 5	Measured on a five point agreement scale, where a 1 is strongly in disagreement with that statement to 5 strongly agreeing with that statement	custom	Scale - 1
8. I found the system very cumbersome to use	Number	1,2,3,4,or 5	Measured on a five point agreement scale, where a 1 is strongly in disagreement with that statement to 5 strongly agreeing with that statement	custom	Scale - 5
9. I felt very confident using the system	Number	1,2,3,4,or 5	Measured on a five point agreement scale, where a 1 is strongly in disagreement with that statement to 5 strongly agreeing with that statement	custom	Scale - 1
10. I need to learn a lot of things before I could get going with this system	Number	1,2,3,4,or 5	Measured on a five point agreement scale, where a 1 is strongly in disagreement with that statement to 5 strongly agreeing with that statement	custom	Scale - 5

System usability = (sum of above Post_SUS adjustment averages) times 2.5

SUS Calculation

Calculation Notes: SUS yields a single number representing a composite measure of the overall usability of the system being studied. Note that scores for individual items are not meaningful on their own.

To calculate the SUS score, first sum the score contributions from each item. Each item's score contribution will range from 0 to 4. For items 1,3,5,7 and 9 the score contribution is the scale position minus 1. For items 2,4,6,8 and 10 the contribution is 5 minus the scale position.

Multiplying the sum of the scores by 2.5 to obtain the overall value of SU.

SUS scores have a range of 0 to 100.1

Brooke, J.: SUS: A "quick and dirty" usability scale. In: Jordan, P. W., Thomas, B., Weerdmeester, B.A., McClelland (eds.) Usability Evaluation in Industry pp. 189—194. Taylor & Francis, London, UK (1996). SUS is copyrighted to Digital Equipment Corporation, 1986.

Efficiency: Task Time

Each task performed by the participant was timed in seconds. Utilizing this data then allowed for a mean time for completion for each task.

- **Base and Allotted Task Time:** Base Task Time predetermined by training/support department pretesting to determine optimal time in seconds. This is the Base. An Allotted time was then determined by the following - Base 1-60 + 15, Base 61-120 + 30, Base 121-180 + 45, all Rounded up to the next 15 second increment. The allotted time is to account for minor user preferences and the natural variation in the rate that different users would work.

Efficiency: Task Deviations

Best paths (i.e., procedural steps) were recorded when constructing tasks. These paths were noted on the test administrator's Moderator's Guide, with their scripts and notes sheets. The test administrators were instructed to note any wide deviations off the optimal path.

- **Base and Allotted Task Paths:** Base Task Path predetermined by training/support department pretesting to determine optimal Path. This is the Base. An Allotted path was then determined by the following - Base 1-5, +1, Base 6-10 +2, Base 11-15 +3, Base 16-20 +4. The allotted base is to account for minor user preferences and possible unfamiliarity to not using a feature that often or not at all on a day to day basis.

Efficiency Score:

After the task was done or stopped, the test administrator was asked to rate the participant's efficiency by evaluating the choice of paths (click rate) and time taken to complete the task. The administrator rated the efficiency of the participant's paths using a five point scale. An average across participant score was then calculated for each task.

- 1 = Could not complete Task.
- 2 = Went over Both allotted clicks and allotted time but completed task.
- 3 = Went over either the allotted clicks or allotted time but completed task.
- 4 = Completed task within both the allotted clicks and allotted time.
- 5 = Completed task with within the BASE clicks and time or less.

Effectiveness: Task Success

A task was counted as a "Success" if the participant was able to achieve the correct outcome, without assistance. (The Task was successful?: Yes No) The total number of successes were calculated for each task creating a ration of total tested to total success. Same for task failures if any.

Satisfaction: Task Rating

The participant's subjective impression of the ease of use of the application was measured by administering both a simple post-task question as well as a post-session questionnaire.

Post-Task Rating

For the post-task measurement, after each task, the participant was asked, "How would you rate the [task] on a five point scale where, 1 is very difficult, 3 is average, and 5 is very easy?" These data points are averaged across participants. Common convention is that average ratings for systems judged easy to use should be 3.3 or above.

Question - How would you rate the Task on a five point scale, where 1 is very difficult, 3 is average, and 5 is very easy?

Answer - 1= Very difficult 2= Difficult 3= Average 4= Easy 5= Very easy

Post-Session Rating

For the post-session measurement, participants' confidence in, and like-ability of, the AllegianceMD - Veracity EHR program were tested by the administrators, using the System Usability Scale (SUS) post-test questionnaire. Questions included

- "I think I would like to use this system frequently."
- "I thought the system was easy to use."
- "I would imagine that most people would learn to use this system very quickly."

These kinds of statements were rated on a five point scale, where 1 is strongly disagree, and 5 is strongly agree. (See SUS Table Above for full details)

Results

Data Analysis and Reporting

Criteria Summary: On the following pages are the tables for each task section containing the results from the testing and the analysis used to complete the summary at the beginning of the report.

All Summary numbers except the Task Ratings and Task Rating Standard Deviations (SD) are rounded to the closest full digit.
(rounded down from <0.5 and rounded up from >= 0.5)

All Summary Task Ratings and Task Rating Standard Deviations (SD) are rounded to the closest tenth of a digit.
(rounded down from <0.05 and rounded up from >= 0.05)

§ 170.315 (a)(1) Computerized Provider Order Entry (CPOE) – medications

Task 1: Electronically Enter an electronic prescription order

Task Instructions: Starting on Patients demographics tab - Order a prescription for (LevoFloxacin– Tablet - 500 mg – 1 po qday – Oral – Quantity 15, days 15) and save.

Tester ID #	Effectiveness		Task Path		Efficiency		Satisfaction	
	Task Success	Task Failures	Optimal	Observed	Task Time Optimal	Task Time Observed	Moderator Task Rating	Participant Task Rating
ID #: 1	Y	-	11	23	46	83	2	3
ID #: 2	-	-	-	-	-	-	-	-
ID #: 3	-	-	-	-	-	-	-	-
ID #: 4	Y	-	11	13	46	101	3	5
ID #: 5	Y	-	11	15	46	72	3	4
ID #: 6	Y	-	11	12	46	46	4	5
ID #: 7	Y	-	11	12	46	66	4	5
ID #: 8	Y	-	11	13	46	88	3	3
ID #: 9	Y	-	11	11	46	53	4	4
ID #: 10	Y	-	11	12	46	51	4	5
ID #: 11	Y	-	11	8	46	32	5	5
ID #: 12	Y	-	11	13	46	92	3	5

Summary of Task 1: Electronically Enter an electronic prescription order

Total Tested	Task Success %	Task Failures %	Task Path Optimal/Observed MEAN	Task Path (SD)	Task Time Optimal/Observed MEAN	Task Time (SD)	Moderator Task Rating MEAN	Participant Task Rating MEAN	Participant Task Rating (SD)
10	100%	0%	11/13	4	46/68	21	3.5	4.4	0.8

Task 2: Electronically Change an electronic prescription order

Task Instructions: Starting on Patients Medications tab - Edit the prescription to (LevoFloxacin– Tablet - 500 mg – 1 po qday – Oral – Quantity 10, days 10) save

Tester ID #	Effectiveness		Task Path		Efficiency		Satisfaction	
	Task Success	Task Failures	Optimal	Observed	Task Time Optimal	Task Time Observed	Moderator Task Rating	Participant Task Rating
ID #: 1	Y	-	4	6	12	22	3	5
ID #: 2	-	-	-	-	-	-	-	-
ID #: 3	-	-	-	-	-	-	-	-
ID #: 4	Y	-	4	5	12	13	4	5
ID #: 5	Y	-	4	6	12	15	3	5
ID #: 6	Y	-	4	14	12	42	2	4
ID #: 7	Y	-	4	5	12	31	3	5
ID #: 8	Y	-	4	4	12	11	5	5
ID #: 9	Y	-	4	5	12	12	4	5
ID #: 10	Y	-	4	5	12	24	4	5
ID #: 11	Y	-	4	5	12	13	4	5
ID #: 12	Y	-	4	6	12	18	3	5

Summary of Task 2: Electronically Change an electronic prescription order

Total Tested	Task Success %	Task Failures %	Task Path Optimal/Observed MEAN	Task Path (SD)	Task Time Optimal/Observed MEAN	Task Time (SD)	Moderator Task Rating MEAN	Participant Task Rating MEAN	Participant Task Rating (SD)
10	100%	0%	4/6	3	12/20	9	3.5	4.9	0.3

Task 3: Electronically Send an electronic prescription order

Task Instructions: Starting on Patients Medications tab – Send the prescription.

Tester ID #	Effectiveness		Task Path		Efficiency		Satisfaction	
	Task Success	Task Failures	Optimal	Observed	Task Time Optimal	Task Time Observed	Moderator Task Rating	Participant Task Rating
ID #: 1	Y	-	3	5	6	57	2	5
ID #: 2	-	-	-	-	-	-	-	-
ID #: 3	-	-	-	-	-	-	-	-
ID #: 4	Y	-	3	3	6	4	5	5
ID #: 5	Y	-	3	3	6	5	5	5
ID #: 6	Y	-	3	3	6	4	5	5
ID #: 7	Y	-	3	6	6	11	4	5
ID #: 8	Y	-	3	4	6	6	5	5
ID #: 9	Y	-	3	3	6	4	5	5
ID #: 10	Y	-	3	3	6	6	5	5
ID #: 11	Y	-	3	3	6	5	5	5
ID #: 12	Y	-	3	4	6	9	4	5

Summary of Task 3: Electronically Send an electronic prescription order

Total Tested	Task Success %	Task Failures %	Task Path Optimal/Observed MEAN	Task Path (SD)	Task Time Optimal/Observed MEAN	Task Time (SD)	Moderator Task Rating MEAN	Participant Task Rating MEAN	Participant Task Rating (SD)
10	100%	0%	3/4	1	6/11	15	4.5	5.0	0.0

Notes:

- 1 – Testers 2 and 3 did not participate for these tests as it was not something they did as part of their job.
- 2 – User 11 utilized the favorites list to their advantage.
- 3 – Surprised not as many users checked the Favorites list as it speeds things up.
- 4 – Suggest a training tip to utilize Favorites when possible.
- 5 – In general the users did much unneeded "searching" and some veered off path at first.
- 6 – Found that editing did not show day supply and had to go to a different area.
- 7 – Recommended a full info display rather than going from one area to another (see # 6 also)
- 8 – Tester 1 started commenting about things not involving the task as they did the task in a distracted manner slowing down performance time.
- 9 – Recommended a pending send folder to send in bulk.
- 10 – Recommended a drag and drop send option – quicker.
- 11 – Admin Note: General ERx display could be improved and would lessen time and confusion.
- 12 – Admin Note: Really good feedback and suggestions from this test round.

§ 170.315 (a)(2) CPOE – laboratory

Task 4: Electronically Enter Lab Order

Task Instructions: Starting on Patients demographics tab – Place the following lab order (Strep Screen, Rapid with Diagnosis J02.0) save.

Tester ID #	Effectiveness		Efficiency				Satisfaction	
	Task Success	Task Failures	Task Path Optimal	Task Path Observed	Task Time Optimal	Task Time Observed	Moderator Task Rating	Participant Task Rating
ID #: 1	Y	-	8	8	18	20	4	5
ID #: 2	Y	-	8	8	18	17	5	5
ID #: 3	Y	-	8	9	18	21	4	4
ID #: 4	Y	-	8	11	18	31	4	5
ID #: 5	Y	-	8	8	18	23	4	5
-ID #: 6	Y	-	8	8	18	19	4	5
ID #: 7	Y	-	8	13	18	37	3	5
ID #: 8	Y	-	8	8	18	21	4	5
ID #: 9	Y	-	8	8	18	16	5	5
ID #: 10	Y	-	8	8	18	25	4	5
ID #: 11	Y	-	8	11	18	19	3	5
ID #: 12	Y	-	8	8	18	28	4	5

Summary of Task 4: Electronically Enter Lab Order

Total Tested	Task Success %	Task Failures %	Task Path Optimal/Observed MEAN	Task Path (SD)	Task Time Optimal/Observed MEAN	Task Time (SD)	Moderator Task Rating MEAN	Participant Task Rating MEAN	Participant Task Rating (SD)
12	100%	0%	8/9	2	18/23	6	4.0	4.9	0.3

Task 5: Electronically Change Lab Order

Task Instructions: Starting on Patients Summary tab - Edit Lab order by marking the Order STAT.

Tester ID #	Effectiveness		Efficiency				Satisfaction	
	Task Success	Task Failures	Task Path Optimal	Task Path Observed	Task Time Optimal	Task Time Observed	Moderator Task Rating	Participant Task Rating
ID #: 1	Y	-	3	4	6	8	4	5
ID #: 2	Y	-	3	3	6	5	5	5
ID #: 3	Y	-	3	11	6	38	2	4
ID #: 4	Y	-	3	3	6	6	5	5
ID #: 5	Y	-	3	3	6	5	5	5
ID #: 6	Y	-	3	4	6	8	4	5
ID #: 7	Y	-	3	16	6	67	2	2
ID #: 8	Y	-	3	5	6	15	2	5
ID #: 9	Y	-	3	3	6	8	4	5
ID #: 10	Y	-	3	8	6	16	3	5
ID #: 11	Y	-	3	13	6	23	2	4
ID #: 12	Y	-	3	3	6	7	4	5

Summary of Task 5: Electronically Change Lab Order

Total Tested	Task Success %	Task Failures %	Task Path Optimal/Observed MEAN	Task Path (SD)	Task Time Optimal/Observed MEAN	Task Time (SD)	Moderator Task Rating MEAN	Participant Task Rating MEAN	Participant Task Rating (SD)
12	100%	0%	3/6	4	6/17	18	3.5	4.6	0.9

Task 6: Electronically Send Lab Order

Task Instructions: Starting on Patients Summary tab – Send electronically the Lab Order.

Tester ID #	Effectiveness		Efficiency				Satisfaction	
	Task Success	Task Failures	Task Path Optimal	Task Path Observed	Task Time Optimal	Task Time Observed	Moderator Task Rating	Participant Task Rating
ID #: 1	Y	-	3	4	7	9	4	5
ID #: 2	Y	-	3	3	7	5	5	5
ID #: 3	Y	-	3	4	7	8	4	5
ID #: 4	Y	-	3	6	7	14	3	4
ID #: 5	Y	-	3	3	7	8	4	5
ID #: 6	Y	-	3	3	7	7	5	5
ID #: 7	Y	-	3	4	7	9	4	5
ID #: 8	Y	-	3	3	7	9	4	5
ID #: 9	Y	-	3	3	7	6	5	5
ID #: 10	Y	-	3	5	7	19	3	4
ID #: 11	Y	-	3	3	7	9	4	3
ID #: 12	Y	-	3	4	7	8	4	5

Summary of Task 6: Electronically Send Lab Order

Total Tested	Task Success %	Task Failures %	Task Path Optimal/Observed MEAN	Task Path (SD)	Task Time Optimal/Observed MEAN	Task Time (SD)	Moderator Task Rating MEAN	Participant Task Rating MEAN	Participant Task Rating (SD)
12	100%	0%	3/5	1	7/9	4	4.08	4.7	0.6

NOTES:

- 1 – Felt the layout was confusing, especially if a newer user.
- 2 – Wanted to Edit defaults with CPT's from the orders screen
- 3 – Thought it was odd to need to open the order to send it.
- 4 – ADMIN NOTE: All in all most people did well with this test round

§ 170.315 (a)(3) CPOE – diagnostic imaging

Task 7: Electronically Enter Imaging Order

Task Instructions: Starting on Patients demographics tab – Place the following imaging order (Wrist Left 2 Views) save.

Tester ID #	Effectiveness		Efficiency				Satisfaction	
	Task Success	Task Failures	Task Path Optimal	Task Path Observed	Task Time Optimal	Task Time Observed	Moderator Task Rating	Participant Task Rating
ID #: 1	Y	-	7	7	16	18	5	5
ID #: 2	Y	-	7	7	16	17	4	5
ID #: 3	Y	-	7	10	16	22	3	3
ID #: 4	Y	-	7	7	16	15	5	5
ID #: 5	Y	-	7	9	16	18	4	5
ID #: 6	Y	-	7	8	16	21	4	5
ID #: 7	Y	-	7	12	16	43	3	4
ID #: 8	Y	-	7	7	16	14	5	5
ID #: 9	Y	-	7	8	16	19	4	5
ID #: 10	Y	-	7	7	16	17	4	5
ID #: 11	Y	-	7	13	16	31	3	4
ID #: 12	Y	-	7	7	16	19	4	5

Summary of Task 7: Electronically Enter Imaging Order

Total Tested	Task Success %	Task Failures %	Task Path Optimal/Observed MEAN	Task Path (SD)	Task Time Optimal/Observed MEAN	Task Time (SD)	Moderator Task Rating MEAN	Participant Task Rating MEAN	Participant Task Rating (SD)
12	100%	0%	7/9	2	16/21	8	4.0	4.7	0.6

Task 8: Electronically Change Imaging Order

Task Instructions: Starting on Patients Summary tab - Edit Imaging order from Bill Insurance to Client Bill.

Tester ID #	Effectiveness		Efficiency				Satisfaction	
	Task Success	Task Failures	Task Path Optimal	Task Path Observed	Task Time Optimal	Task Time Observed	Moderator Task Rating	Participant Task Rating
ID #: 1	Y	-	3	3	5	6	5	5
ID #: 2	Y	-	3	4	5	7	4	5
ID #: 3	Y	-	3	8	5	19	4	3
ID #: 4	Y	-	3	3	5	6	5	5
ID #: 5	Y	-	3	4	5	6	4	5
ID #: 6	Y	-	3	11	5	17	4	4
ID #: 7	Y	-	3	15	5	28	3	4
ID #: 8	Y	-	3	3	5	6	5	5
ID #: 9	Y	-	3	4	5	8	4	5
ID #: 10	Y	-	3	8	5	21	3	5
ID #: 11	Y	-	3	7	5	12	3	3
ID #: 12	Y	-	3	3	5	5	5	5

Summary of Task 8: Electronically Change Imaging Order

Total Tested	Task Success %	Task Failures %	Task Path Optimal/Observed MEAN	Task Path (SD)	Task Time Optimal/Observed MEAN	Task Time (SD)	Moderator Task Rating MEAN	Participant Task Rating MEAN	Participant Task Rating (SD)
12	100%	0%	3/6	4	5/12	7	4.08	4.5	0.8

Task 9: Electronically Send Imaging Order

Task Instructions: Starting on Patients Summary tab – Send electronically the Imaging Order.

Tester ID #	Effectiveness		Efficiency				Satisfaction	
	Task Success	Task Failures	Task Path Optimal	Task Path Observed	Task Time Optimal	Task Time Observed	Moderator Task Rating	Participant Task Rating
ID #: 1	Y	-	3	4	7	9	4	5
ID #: 2	Y	-	3	3	7	6	5	5
ID #: 3	Y	-	3	4	7	8	4	5
ID #: 4	Y	-	3	4	7	7	4	5
ID #: 5	Y	-	3	3	7	6	5	5
ID #: 6	Y	-	3	3	7	8	4	5
ID #: 7	Y	-	3	4	7	9	4	5
ID #: 8	Y	-	3	3	7	5	5	5
ID #: 9	Y	-	3	3	7	6	5	5
ID #: 10	Y	-	3	6	7	23	3	4
ID #: 11	Y	-	3	5	7	17	3	4
ID #: 12	Y	-	3	4	7	11	4	5

Summary of Task 9: Electronically Send Imaging Order

Total Tested	Task Success %	Task Failures %	Task Path Optimal/Observed MEAN	Task Path (SD)	Task Time Optimal/Observed MEAN	Task Time (SD)	Moderator Task Rating MEAN	Participant Task Rating MEAN	Participant Task Rating (SD)
12	100%	0%	3/4	1	7/10	5	4.16	4.8	0.4

NOTES:

- 1 – Felt the layout was confusing, especially if a newer user.
- 2 – Wanted to Edit defaults with CPT's from the orders screen
- 3 – Thought it was odd to need to open the order to send it.
- 4 – ADMIN NOTE: Essentially the same comments as ordering a Lab as they are done in a similar fashion.

§ 170.315 (a)(4) Drug-drug, Drug-allergy Interaction Checks for CPOE

Task 10: Manage Drug Interaction/Drug Allergy settings

Task Instructions: Starting from Home Screen – Change the Drug-drug, drug-allergy alert settings to Severe.

Tester ID #	Effectiveness		Efficiency				Satisfaction	
	Task Success	Task Failures	Task Path Optimal	Task Path Observed	Task Time Optimal	Task Time Observed	Moderator Task Rating	Participant Task Rating
ID #: 1	Y	-	5	7	14	36	3	4
ID #: 2	-	-	-	-	-	-	-	-
ID #: 3	-	-	-	-	-	-	-	-
ID #: 4	Y	-	5	5	14	15	4	5
ID #: 5	Y	-	5	6	14	15	4	5
ID #: 6	Y	-	5	5	14	19	4	5
ID #: 7	Y	-	5	9	14	37	2	4
ID #: 8	Y	-	5	6	14	19	4	5
ID #: 9	Y	-	5	7	14	23	3	5
ID #: 10	Y	-	5	5	14	17	4	4
ID #: 11	Y	-	5	6	14	21	4	5
ID #: 12	Y	-	5	7	14	17	3	5

Summary of Task 10: Manage Drug Interaction/Drug Allergy settings

Total Tested	Task Success %	Task Failures %	Task Path Optimal/Observed MEAN	Task Path (SD)	Task Time Optimal/Observed MEAN	Task Time (SD)	Moderator Task Rating MEAN	Participant Task Rating MEAN	Participant Task Rating (SD)
10	100%	0%	5/6	1	14/22	8	3.5	4.5	0.5

Task 11: Respond to Triggered Drug Interactions/Drug Allergies

Task Instructions: Starting on Patients demographics tab - Order a prescription for (Penicillin V Potassium– Tablet - 250 mg – 1 po qday – Oral – Quantity 10, days 10), Alert warning for severe reaction should trigger, Amend to (Levaquin - 500 mg – 1 po qday – Oral – Quantity 7, days 7)

Tester ID #	Effectiveness		Efficiency				Satisfaction	
	Task Success	Task Failures	Task Path Optimal	Task Path Observed	Task Time Optimal	Task Time Observed	Moderator Task Rating	Participant Task Rating
ID #: 1	Y	-	17	19	98	105	4	5
ID #: 2	-	-	-	-	-	-	-	-
ID #: 3	-	-	-	-	-	-	-	-
ID #: 4	Y	-	17	17	98	114	4	5
ID #: 5	Y	-	17	20	98	117	4	5
ID #: 6	Y	-	17	17	98	110	4	5
ID #: 7	Y	-	17	18	98	106	4	5
ID #: 8	Y	-	17	29	98	131	3	3
ID #: 9	Y	-	17	21	98	111	4	4
ID #: 10	Y	-	17	18	98	103	4	5
ID #: 11	Y	-	17	23	98	145	2	4
ID #: 12	Y	-	17	19	98	107	4	5

Summary of Task 11: Respond to Triggered Drug Interactions/Drug Allergies

Total Tested	Task Success %	Task Failures %	Task Path Optimal/Observed MEAN	Task Path (SD)	Task Time Optimal/Observed MEAN	Task Time (SD)	Moderator Task Rating MEAN	Participant Task Rating MEAN	Participant Task Rating (SD)
10	100%	0%	17/21	3	98/115	13	3.7	4.6	0.7

NOTES:

- 1 – Testers 2 and 3 did not participate for these tests as it was not something they did as part of their job.
- 2 – Many testers mentioned that just selecting a drug to prescribe should trigger the alert right away rather than having to go through the whole ERx process before it triggers.

§ 170.315 (a)(5) Demographics

Task 12: Record a patients Sexual Orientation and Gender Identity

Task Instructions: Starting from home screen - record the sexual orientation and gender identity for the assigned testing patient – (Patient Identifies as Straight, and Identifies as Female)

Tester ID #	Effectiveness		Efficiency				Satisfaction	
	Task Success	Task Failures	Task Path Optimal	Task Path Observed	Task Time Optimal	Task Time Observed	Moderator Task Rating	Participant Task Rating
ID #: 1	Y	-	5	5	12	11	5	5
ID #: 2	Y	-	5	5	12	13	4	5
ID #: 3	Y	-	5	5	12	12	5	5
ID #: 4	Y	-	5	5	12	12	5	5
ID #: 5	Y	-	5	5	12	13	4	5
ID #: 6	Y	-	5	6	12	14	4	5
ID #: 7	Y	-	5	5	12	12	5	5
ID #: 8	Y	-	5	6	12	17	4	5
ID #: 9	Y	-	5	5	12	14	4	5
ID #: 10	Y	-	5	5	12	15	4	5
ID #: 11	Y	-	5	6	12	16	4	5
ID #: 12	Y	-	5	5	12	14	4	5

Summary of Task 12: Record a patients Sexual Orientation and Gender Identity

Total Tested	Task Success %	Task Failures %	Task Path Optimal/Observed MEAN	Task Path (SD)	Task Time Optimal/Observed MEAN	Task Time (SD)	Moderator Task Rating MEAN	Participant Task Rating MEAN	Participant Task Rating (SD)
12	100%	0%	5/5	0	12/14	2	4.33	5.0	0.0

Task 13: Record a patients Preferred Name, Race and Ethnicity

Task Instructions: Starting from home screen - record preferred name and race and ethnicity – (Preferred name: Nicki – Race: White – Ethnicity: Hispanic or Latino)

Tester ID #	Effectiveness		Efficiency				Satisfaction	
	Task Success	Task Failures	Task Path Optimal	Task Path Observed	Task Time Optimal	Task Time Observed	Moderator Task Rating	Participant Task Rating
ID #: 1	Y	-	6	6	13	14	4	5
ID #: 2	Y	-	6	6	13	11	5	5
ID #: 3	Y	-	6	7	13	14	4	5
ID #: 4	Y	-	6	8	13	20	4	5
ID #: 5	Y	-	6	6	13	13	5	5
ID #: 6	Y	-	6	7	13	19	4	5
ID #: 7	Y	-	6	7	13	16	4	5
ID #: 8	Y	-	6	6	13	14	4	5
ID #: 9	Y	-	6	6	13	14	4	5
ID #: 10	Y	-	6	7	13	23	4	5
ID #: 11	Y	-	6	7	13	18	4	5
ID #: 12	Y	-	6	6	13	15	4	5

Summary of Task 13: Record a patients Preferred Name, Race and Ethnicity

Total Tested	Task Success %	Task Failures %	Task Path Optimal/Observed MEAN	Task Path (SD)	Task Time Optimal/Observed MEAN	Task Time (SD)	Moderator Task Rating MEAN	Participant Task Rating MEAN	Participant Task Rating (SD)
12	100%	0%	6/7	1	13/16	3	4.16	5.0	0.0

NOTES: NONE

§ 170.315 (a)(6) Problem List

Task 14: Record a patients Diagnosis

Task Instructions: Starting on Patients demographics tab – Add a diagnosis to the active problem list – (Acute pharyngitis, unspecified J02.9).

Tester ID #	Effectiveness		Efficiency				Satisfaction	
	Task Success	Task Failures	Task Path Optimal	Task Path Observed	Task Time Optimal	Task Time Observed	Moderator Task Rating	Participant Task Rating
ID #: 1	Y	-	5	6	9	13	4	5
ID #: 2	Y	-	5	5	9	8	5	5
ID #: 3	Y	-	5	6	9	17	4	4
ID #: 4	Y	-	5	5	9	10	4	5
ID #: 5	Y	-	5	5	9	9	5	5
ID #: 6	Y	-	5	7	9	21	3	5
ID #: 7	Y	-	5	5	9	11	4	5
ID #: 8	Y	-	5	6	9	15	4	5
ID #: 9	Y	-	5	7	9	17	3	5
ID #: 10	Y	-	5	7	9	18	3	5
ID #: 11	Y	-	5	13	9	29	3	4
ID #: 12	Y	-	5	5	9	10	4	5

Summary of Task 14: Record a patients Diagnosis

Total Tested	Task Success %	Task Failures %	Task Path Optimal/Observed MEAN	Task Path (SD)	Task Time Optimal/Observed MEAN	Task Time (SD)	Moderator Task Rating MEAN	Participant Task Rating MEAN	Participant Task Rating (SD)
12	100%	0%	5/6	2	9/15	6	3.83	4.8	0.4

Task 15: Edit a patients Diagnosis

Task Instructions: Starting on Patients Summary tab - Change diagnosis of Acute pharyngitis, unspecified J02.9 on the active problem list to - (Streptococcal pharyngitis J02.0)

Tester ID #	Effectiveness		Efficiency				Satisfaction	
	Task Success	Task Failures	Task Path Optimal	Task Path Observed	Task Time Optimal	Task Time Observed	Moderator Task Rating	Participant Task Rating
ID #: 1	Y	-	6	6	8	16	4	5
ID #: 2	Y	-	6	6	8	7	5	5
ID #: 3	Y	-	6	8	8	29	4	4
ID #: 4	Y	-	6	6	8	15	4	5
ID #: 5	Y	-	6	6	8	9	4	5
ID #: 6	Y	-	6	6	8	11	4	5
ID #: 7	Y	-	6	6	8	19	4	5
ID #: 8	Y	-	6	6	8	9	4	5
ID #: 9	Y	-	6	6	8	7	5	5
ID #: 10	Y	-	6	6	8	6	5	5
ID #: 11	Y	-	6	7	8	9	4	5
ID #: 12	Y	-	6	6	8	12	4	5

Summary of Task 15: Edit a patients Diagnosis

Total Tested	Task Success %	Task Failures %	Task Path Optimal/Observed MEAN	Task Path (SD)	Task Time Optimal/Observed MEAN	Task Time (SD)	Moderator Task Rating MEAN	Participant Task Rating MEAN	Participant Task Rating (SD)
12	100%	0%	6/6	1	8/13	6	4.25	4.9	0.3

NOTES:

- 1 – Used a shortcut
- 2 – Was confused about the difference between SAVE and SAVE AS NEW.
- 3 – ADMIN NOTE: Was surprised that all except one did not use the shortcut features that would have made it quicker for them.

§ 170.315 (a)(7) Medication List

Task 16: Record a patients current Medication

Task Instructions: Starting on Patients demographics tab - Record a medication (Albuterol 2 mg tablet 3 times a day) to active medications list.

Tester ID #	Effectiveness		Efficiency				Satisfaction	
	Task Success	Task Failures	Task Path Optimal	Task Path Observed	Task Time Optimal	Task Time Observed	Moderator Task Rating	Participant Task Rating
ID #: 1	Y	-	6	6	23	24	4	5
ID #: 2	Y	-	6	7	23	23	4	5
ID #: 3	Y	-	6	11	23	67	2	4
ID #: 4	Y	-	6	7	23	35	4	4
ID #: 5	Y	-	6	11	23	42	3	3
ID #: 6	Y	-	6	6	23	26	4	5
ID #: 7	Y	-	6	11	23	45	3	4
ID #: 8	Y	-	6	12	23	61	2	4
ID #: 9	Y	-	6	8	23	29	4	5
ID #: 10	Y	-	6	11	23	55	2	4
ID #: 11	Y	-	6	7	23	27	4	5
ID #: 12	Y	-	6	7	23	25	4	5

Summary of Task 16: Record a patients current Medication

Total Tested	Task Success %	Task Failures %	Task Path Optimal/Observed MEAN	Task Path (SD)	Task Time Optimal/Observed MEAN	Task Time (SD)	Moderator Task Rating MEAN	Participant Task Rating MEAN	Participant Task Rating (SD)
12	100%	0%	6/9	2	23/38	15	3.33	4.0	0.6

Task 17: Edit a patients current Medication

Task Instructions: Starting on Patients Medications tab - Edit a active medication (Cortisone Acetate 25 MG Tablet) – (Stop the med) and add note (Ran course)

Tester ID #	Effectiveness		Efficiency				Satisfaction	
	Task Success	Task Failures	Task Path Optimal	Task Path Observed	Task Time Optimal	Task Time Observed	Moderator Task Rating	Participant Task Rating
ID #: 1	Y	-	4	4	11	16	4	5
ID #: 2	Y	-	4	5	11	9	4	5
ID #: 3	Y	-	4	13	11	49	2	3
ID #: 4	Y	-	4	8	11	22	3	3
ID #: 5	Y	-	4	7	11	19	3	4
ID #: 6	Y	-	4	4	11	9	5	5
ID #: 7	Y	-	4	6	11	13	3	4
ID #: 8	Y	-	4	5	11	15	4	4
ID #: 9	Y	-	4	4	11	11	5	5
ID #: 10	Y	-	4	5	11	13	4	5
ID #: 11	Y	-	4	14	11	54	2	3
ID #: 12	Y	-	4	4	11	14	4	5

Summary of Task 17: Edit a patients current Medication

Total Tested	Task Success %	Task Failures %	Task Path Optimal/Observed MEAN	Task Path (SD)	Task Time Optimal/Observed MEAN	Task Time (SD)	Moderator Task Rating MEAN	Participant Task Rating MEAN	Participant Task Rating (SD)
12	100%	0%	4/7	3	11/20	14	3.58	4.3	0.8

NOTES:

1 – Felt that the edit process was "glitchy".

2 – ADMIN NOTE: For a task that is done on a multiple times a day basis for these testers, was quite surprised how much difficulty they had with this. They all managed to complete the task(s) but many strayed or took way longer than it should have.

§ 170.315 (a)(8) Medication Allergy List

Task 18: Record a patients Drug Allergy

Task Instructions: Starting on Patients demographics tab – Add a Drug Allergy (Penicillin) with (Start Date 01/01/2000 - Symptoms Skin Rash, Hives)

Tester ID #	Effectiveness		Efficiency				Satisfaction	
	Task Success	Task Failures	Task Path Optimal	Task Path Observed	Task Time Optimal	Task Time Observed	Moderator Task Rating	Participant Task Rating
ID #: 1	Y	-	5	6	9	12	4	5
ID #: 2	Y	-	5	7	9	18	3	5
ID #: 3	Y	-	5	5	9	9	5	5
ID #: 4	Y	-	5	5	9	10	4	5
ID #: 5	Y	-	5	5	9	6	5	5
ID #: 6	Y	-	5	5	9	9	5	5
ID #: 7	Y	-	5	6	9	11	4	5
ID #: 8	Y	-	5	7	9	16	3	4
ID #: 9	Y	-	5	9	9	13	3	3
ID #: 10	Y	-	5	5	9	7	5	5
ID #: 11	Y	-	5	5	9	9	5	5
ID #: 12	Y	-	5	5	9	8	5	5

Summary of Task 18: Record a patients Drug Allergy

Total Tested	Task Success %	Task Failures %	Task Path Optimal/Observed MEAN	Task Path (SD)	Task Time Optimal/Observed MEAN	Task Time (SD)	Moderator Task Rating MEAN	Participant Task Rating MEAN	Participant Task Rating (SD)
12	100%	0%	5/6	1	9/11	3	4.25	4.8	0.6

Task 19: Edit a patients Drug Allergy

Task Instructions: Starting on Patients Summary tab – Edit patients Drug Allergy (IODINE) – (Add: WARNING)

Tester ID #	Effectiveness		Efficiency				Satisfaction	
	Task Success	Task Failures	Task Path Optimal	Task Path Observed	Task Time Optimal	Task Time Observed	Moderator Task Rating	Participant Task Rating
ID #: 1	Y	-	3	3	5	4	5	5
ID #: 2	Y	-	3	4	5	9	4	5
ID #: 3	Y	-	3	3	5	5	5	5
ID #: 4	Y	-	3	3	5	6	4	5
ID #: 5	Y	-	3	3	5	6	4	5
ID #: 6	Y	-	3	3	5	5	5	5
ID #: 7	Y	-	3	3	5	4	5	5
ID #: 8	Y	-	3	3	5	5	5	5
ID #: 9	Y	-	3	4	5	7	4	5
ID #: 10	Y	-	3	4	5	6	4	5
ID #: 11	Y	-	3	3	5	4	5	5
ID #: 12	Y	-	3	4	5	8	4	5

Summary of Task 19: Edit a patients Drug Allergy

Total Tested	Task Success %	Task Failures %	Task Path Optimal/Observed MEAN	Task Path (SD)	Task Time Optimal/Observed MEAN	Task Time (SD)	Moderator Task Rating MEAN	Participant Task Rating MEAN	Participant Task Rating (SD)
12	100%	0%	3/3	0	5/6	2	4.5	5.0	0.0

NOTES: NONE

§ 170.315 (a)(9) Clinical Decision Support

Task 20: Manage the EMR's Clinical Decision Support Settings

Task Instructions: Starting from home screen - Add a clinical decision support reminder for the following (I10 Essential (primary) hypertension - BP check – recurring every 30 days)

Tester ID #	Effectiveness		Efficiency				Satisfaction	
	Task Success	Task Failures	Task Path Optimal	Task Path Observed	Task Time Optimal	Task Time Observed	Moderator Task Rating	Participant Task Rating
ID #: 1	Y	-	6	7	27	51	3	4
ID #: 2	Y	-	6	15	27	64	2	3
ID #: 3	Y	-	6	7	27	47	3	4
ID #: 4	Y	-	6	6	27	29	4	5
ID #: 5	Y	-	6	8	27	27	4	5
ID #: 6	Y	-	6	7	27	31	4	5
ID #: 7	Y	-	6	9	27	46	2	4
ID #: 8	Y	-	6	7	27	29	4	5
ID #: 9	Y	-	6	8	27	28	4	5
ID #: 10	Y	-	6	6	27	31	4	5
ID #: 11	Y	-	6	11	27	23	3	4
ID #: 12	Y	-	6	8	27	35	4	4

Summary of Task 20: Manage the EMR's Clinical Decision Support Settings

Total Tested	Task Success %	Task Failures %	Task Path Optimal/Observed MEAN	Task Path (SD)	Task Time Optimal/Observed MEAN	Task Time (SD)	Moderator Task Rating MEAN	Participant Task Rating MEAN	Participant Task Rating (SD)
12	100%	0%	6/8	2	27/37	12	3.41	4.4	0.6

Task 21: Review a patients Clinical Decision Support Information

Task Instructions: Starting on Patients demographics tab – Review the patients Clinical Decision Support alerts and unsubscribe the patient from the monthly BP check.

Tester ID #	Effectiveness		Efficiency				Satisfaction	
	Task Success	Task Failures	Task Path Optimal	Task Path Observed	Task Time Optimal	Task Time Observed	Moderator Task Rating	Participant Task Rating
ID #: 1	Y	-	3	4	9	12	4	5
ID #: 2	Y	-	3	3	9	9	5	5
ID #: 3	Y	-	3	3	9	17	4	5
ID #: 4	Y	-	3	3	9	13	4	5
ID #: 5	Y	-	3	4	9	15	4	5
ID #: 6	Y	-	3	4	9	8	4	5
ID #: 7	Y	-	3	4	9	12	4	5
ID #: 8	Y	-	3	5	9	14	3	5
ID #: 9	Y	-	3	3	9	9	5	5
ID #: 10	Y	-	3	5	9	19	3	4
ID #: 11	Y	-	3	5	9	11	3	5
ID #: 12	Y	-	3	6	9	9	3	4

Summary of Task 21: Review a patients Clinical Decision Support Information

Total Tested	Task Success %	Task Failures %	Task Path Optimal/Observed MEAN	Task Path (SD)	Task Time Optimal/Observed MEAN	Task Time (SD)	Moderator Task Rating MEAN	Participant Task Rating MEAN	Participant Task Rating (SD)
12	100%	0%	3/4	1	9/12	3	3.83	4.8	0.4

NOTES:

- 1 – Tester suggested that the patients home demographics page should have an alert regarding CDS to aid in scheduling. Really good idea.
- 2 – ADMIN NOTE: Pleasantly surprised that the testers did as well as they did on this section as I do not believe that it is used as frequently as it should by many practices.

§ 170.315 (a)(14) Implantable Device List

Task 22: Record a patients Implantable Device

Task Instructions: Starting on Patients demographics tab - Record the following implantable device (00850540007126 - Impulse 7000DP pacemaker)

Tester ID #	Effectiveness		Efficiency				Satisfaction	
	Task Success	Task Failures	Task Path Optimal	Task Path Observed	Task Time Optimal	Task Time Observed	Moderator Task Rating	Participant Task Rating
ID #: 1	Y	-	4	5	8	11	4	5
ID #: 2	Y	-	4	6	8	10	3	5
ID #: 3	Y	-	4	6	8	19	3	5
ID #: 4	Y	-	4	4	8	9	4	5
ID #: 5	Y	-	4	4	8	11	4	5
ID #: 6	Y	-	4	4	8	9	4	5
ID #: 7	Y	-	4	5	8	14	4	5
ID #: 8	Y	-	4	7	8	18	3	5
ID #: 9	Y	-	4	6	8	15	3	5
ID #: 10	Y	-	4	7	8	23	3	4
ID #: 11	Y	-	4	5	8	11	4	5
ID #: 12	Y	-	4	6	8	14	3	5

Summary of Task 22: Record a patients Implantable Device

Total Tested	Task Success %	Task Failures %	Task Path Optimal/Observed MEAN	Task Path (SD)	Task Time Optimal/Observed MEAN	Task Time (SD)	Moderator Task Rating MEAN	Participant Task Rating MEAN	Participant Task Rating (SD)
12	100%	0%	4/5	1	8/14	4	3.5	4.9	0.3

NOTES:

1 – Considering this is a new section to the EMR and the testers only had a crash course training on it before testing they did rather well.

§ 170.315 (b)(2) Clinical Information Reconciliation and Incorporation

Task 23: Upload/Assign a Continuity of Care Document to a patients record

Task Instructions: (CCDA Step 1) Starting from the Patients Demographics tab and Using the sample CCDA file provided – Assign and upload the sample CCDA to the patient account – proceed to step 2

Tester ID #	Effectiveness		Efficiency				Satisfaction	
	Task Success	Task Failures	Task Path Optimal	Task Path Observed	Task Time Optimal	Task Time Observed	Moderator Task Rating	Participant Task Rating
ID #: 1	Y	-	9	9	23	27	4	5
ID #: 2	Y	-	9	10	23	28	4	5
ID #: 3	Y	-	9	12	23	53	2	3
ID #: 4	Y	-	9	9	23	21	5	5
ID #: 5	Y	-	9	11	23	29	4	4
ID #: 6	Y	-	9	9	23	24	4	5
ID #: 7	Y	-	9	13	23	38	3	4
ID #: 8	Y	-	9	17	23	63	2	3
ID #: 9	Y	-	9	11	23	26	4	5
ID #: 10	Y	-	9	9	23	22	5	5
ID #: 11	Y	-	9	14	23	48	2	4
ID #: 12	Y	-	9	9	23	27	4	4

Summary of Task 23: Upload/Assign a Continuity of Care Document to a patients record

Total Tested	Task Success %	Task Failures %	Task Path Optimal/Observed MEAN	Task Path (SD)	Task Time Optimal/Observed MEAN	Task Time (SD)	Moderator Task Rating MEAN	Participant Task Rating MEAN	Participant Task Rating (SD)
12	100%	0%	9/11	2	23/34	13	3.58	4.3	0.7

Task 24: Reconcile and Incorporate a Continuity of Care Document with a patients record

Task Instructions: (CCDA Step 2) Once CCDA is uploaded (Step 1) – Select (Medications, Allergies and Problems) from the CCDA to be incorporated in the patients account, reconcile and incorporate.

Tester ID #	Effectiveness		Efficiency				Satisfaction	
	Task Success	Task Failures	Task Path Optimal	Task Path Observed	Task Time Optimal	Task Time Observed	Moderator Task Rating	Participant Task Rating
ID #: 1	Y	-	3	3	6	5	5	5
ID #: 2	Y	-	3	6	6	11	3	4
ID #: 3	Y	-	3	7	6	19	3	4
ID #: 4	Y	-	3	3	6	6	5	5
ID #: 5	Y	-	3	3	6	7	4	5
ID #: 6	Y	-	3	3	6	6	5	5
ID #: 7	Y	-	3	4	6	14	4	5
ID #: 8	Y	-	3	5	6	15	3	4
ID #: 9	Y	-	3	3	6	8	4	5
ID #: 10	Y	-	3	4	6	6	4	5
ID #: 11	Y	-	3	17	6	41	2	3
ID #: 12	Y	-	3	3	6	10	3	5

Summary of Task 24: Reconcile and Incorporate a Continuity of Care Document with a patients record

Total Tested	Task Success %	Task Failures %	Task Path Optimal/Observed MEAN	Task Path (SD)	Task Time Optimal/Observed MEAN	Task Time (SD)	Moderator Task Rating MEAN	Participant Task Rating MEAN	Participant Task Rating (SD)
12	100%	0%	3/5	4	6/12	10	3.75	4.6	0.6

Task 25: Create and Export a Continuity of Care Document for a patient

Task Instructions: Starting from the Patients Demographics tab – Create a CCDA file for all the patients encounter dates.

Tester ID #	Effectiveness		Efficiency				Satisfaction	
	Task Success	Task Failures	Task Path Optimal	Task Path Observed	Task Time Optimal	Task Time Observed	Moderator Task Rating	Participant Task Rating
ID #: 1	Y	-	6	7	14	16	4	5
ID #: 2	Y	-	6	6	14	12	5	5
ID #: 3	Y	-	6	13	14	27	3	4
ID #: 4	Y	-	6	7	14	16	4	5
ID #: 5	Y	-	6	8	14	15	4	5
ID #: 6	Y	-	6	12	14	31	2	3
ID #: 7	Y	-	6	7	14	19	4	5
ID #: 8	Y	-	6	7	14	15	4	5
ID #: 9	Y	-	6	6	14	14	5	5
ID #: 10	Y	-	6	6	14	23	4	5
ID #: 11	Y	-	6	12	14	35	2	5
ID #: 12	Y	-	6	7	14	16	4	5

Summary of Task 25: Create and Export a Continuity of Care Document for a patient

Total Tested	Task Success %	Task Failures %	Task Path Optimal/Observed MEAN	Task Path (SD)	Task Time Optimal/Observed MEAN	Task Time (SD)	Moderator Task Rating MEAN	Participant Task Rating MEAN	Participant Task Rating (SD)
12	100%	0%	6/8	2	14/20	7	3.75	4.8	0.6

NOTES:

1 – Tester went way off path but managed to find way back to correct path and complete the task.

2 – Admin Note: This section based off the testers general comments is not utilized by the practices often if at all. They can see how it would be useful but on a day to day basis it is just not used often. Patients normally want paper records and they rarely receive a CCDA to upload from another provider. Same for when sending info to other providers, the other practices normally just want it faxed over. In general this lack of use most likely contributed to the higher click rates and task times.

§ 170.315 (b)(3) Electronic Prescribing

Task 26: Approve an electronic refill

Task Instructions: Starting from the Patients medications tab – Approve the prescription refill request for (Phenergan 25 MG/1 ML Solution 5 mg po q6 hrs prn nausea) and send electronically.

Tester ID #	Effectiveness		Efficiency				Satisfaction	
	Task Success	Task Failures	Task Path Optimal	Task Path Observed	Task Time Optimal	Task Time Observed	Moderator Task Rating	Participant Task Rating
ID #: 1	Y	-	3	4	4	7	4	5
ID #: 2	-	-	-	-	-	-	-	-
ID #: 3	-	-	-	-	-	-	-	-
ID #: 4	Y	-	3	3	4	4	5	5
ID #: 5	Y	-	3	3	4	5	4	5
ID #: 6	Y	-	3	5	4	13	3	5
ID #: 7	Y	-	3	3	4	5	4	5
ID #: 8	Y	-	3	5	4	19	3	5
ID #: 9	Y	-	3	3	4	5	4	5
ID #: 10	Y	-	3	3	4	3	5	5
ID #: 11	Y	-	3	3	4	4	5	5
ID #: 12	Y	-	3	4	4	9	4	5

Summary of Task 26: Approve an electronic refill

Total Tested	Task Success %	Task Failures %	Task Path Optimal/Observed MEAN	Task Path (SD)	Task Time Optimal/Observed MEAN	Task Time (SD)	Moderator Task Rating MEAN	Participant Task Rating MEAN	Participant Task Rating (SD)
10	100%	0%	3/4	1	4/7	5	4.1	5.0	0.0

Task 27: Approve an Incoming generic pharmacy request

Task Instructions: Starting from the Patients medications tab – Review the first pharmacy change request and approve it.

Tester ID #	Effectiveness		Efficiency				Satisfaction	
	Task Success	Task Failures	Task Path Optimal	Task Path Observed	Task Time Optimal	Task Time Observed	Moderator Task Rating	Participant Task Rating
ID #: 1	Y	-	5	7	9	13	3	5
ID #: 2	-	-	-	-	-	-	-	-
ID #: 3	-	-	-	-	-	-	-	-
ID #: 4	Y	-	5	5	9	10	4	5
ID #: 5	Y	-	5	6	9	14	4	4
ID #: 6	Y	-	5	7	9	16	3	5
ID #: 7	Y	-	5	5	9	11	4	5
ID #: 8	Y	-	5	9	9	24	3	4
ID #: 9	Y	-	5	7	9	12	3	5
ID #: 10	Y	-	5	5	9	10	4	4
ID #: 11	Y	-	5	5	9	8	5	5
ID #: 12	Y	-	5	8	9	13	3	5

Summary of Task 27: Approve an Incoming generic pharmacy request

Total Tested	Task Success %	Task Failures %	Task Path Optimal/Observed MEAN	Task Path (SD)	Task Time Optimal/Observed MEAN	Task Time (SD)	Moderator Task Rating MEAN	Participant Task Rating MEAN	Participant Task Rating (SD)
10	100%	0%	5/7	1	9/13	4	3.6	4.7	0.5

Task 28: Cancel an electronic prescription

Task Instructions: Starting from the Patients medications tab – Cancel the electronic prescription for (Phenergan 25 MG/1 ML Solution 5 mg po q6 hrs prn nausea) and send electronically.

Tester ID #	Effectiveness		Efficiency				Satisfaction	
	Task Success	Task Failures	Task Path Optimal	Task Path Observed	Task Time Optimal	Task Time Observed	Moderator Task Rating	Participant Task Rating
ID #: 1	Y	-	3	9	5	39	2	3
ID #: 2	-	-	-	-	-	-	-	-
ID #: 3	-	-	-	-	-	-	-	-
ID #: 4	Y	-	3	6	5	16	3	4
ID #: 5	Y	-	3	4	5	12	4	5
ID #: 6	Y	-	3	3	5	9	4	5
ID #: 7	Y	-	3	4	5	17	4	5
ID #: 8	Y	-	3	3	5	7	4	5
ID #: 9	Y	-	3	5	5	11	3	4
ID #: 10	Y	-	3	7	5	23	3	4
ID #: 11	Y	-	3	5	5	6	3	4
ID #: 12	Y	-	3	9	5	21	3	5

Summary of Task 28: Cancel an electronic prescription

Total Tested	Task Success %	Task Failures %	Task Path Optimal/Observed MEAN	Task Path (SD)	Task Time Optimal/Observed MEAN	Task Time (SD)	Moderator Task Rating MEAN	Participant Task Rating MEAN	Participant Task Rating (SD)
10	100%	0%	3/6	2	5/16	9	3.3	4.4	0.7

§ 170.315 (b)(3) Electronic Prescribing - Continued

Task 29: Identify Prescription Fill Status

Task Instructions: Starting from the Patients medications tab – Identify the fill status for any one of the prescribed medications.

Tester ID #	Effectiveness		Efficiency				Satisfaction	
	Task Success	Task Failures	Task Path Optimal	Task Path Observed	Task Time Optimal	Task Time Observed	Moderator Task Rating	Participant Task Rating
ID #: 1	Y	-	3	5	3	11	3	5
ID #: 2	-	-	-	-	-	-	-	-
ID #: 3	-	-	-	-	-	-	-	-
ID #: 4	Y	-	3	9	3	23	3	4
ID #: 5	Y	-	3	4	3	8	4	5
ID #: 6	Y	-	3	3	3	5	4	5
ID #: 7	Y	-	3	3	3	4	4	5
ID #: 8	Y	-	3	5	3	12	3	4
ID #: 9	Y	-	3	3	3	6	4	5
ID #: 10	Y	-	3	5	3	9	3	5
ID #: 11	Y	-	3	4	3	6	4	5
ID #: 12	Y	-	3	3	3	7	4	5

Summary of Task 29: Identify Prescription Fill Status

Total Tested	Task Success %	Task Failures %	Task Path Optimal/Observed MEAN	Task Path (SD)	Task Time Optimal/Observed MEAN	Task Time (SD)	Moderator Task Rating MEAN	Participant Task Rating MEAN	Participant Task Rating (SD)
10	100%	0%	3/4	2	3/9	5	3.6	4.8	0.4

Task 30: Modify and Approve an incoming therapeutic pharmacy request

Task Instructions: Starting from the Patients medications tab – Review the second pharmacy change request and change the SIG Quantity and Days to the following (Quantity: 10, Days: 10) and send.

Tester ID #	Effectiveness		Efficiency				Satisfaction	
	Task Success	Task Failures	Task Path Optimal	Task Path Observed	Task Time Optimal	Task Time Observed	Moderator Task Rating	Participant Task Rating
ID #: 1	Y	-	9	12	13	36	2	4
ID #: 2	-	-	-	-	-	-	-	-
ID #: 3	-	-	-	-	-	-	-	-
ID #: 4	Y	-	9	16	13	52	2	3
ID #: 5	Y	-	9	10	13	24	4	4
ID #: 6	Y	-	9	11	13	27	4	5
ID #: 7	Y	-	9	13	13	47	2	4
ID #: 8	Y	-	9	13	13	43	2	4
ID #: 9	Y	-	9	9	13	19	4	5
ID #: 10	Y	-	9	12	13	21	3	5
ID #: 11	Y	-	9	13	13	39	2	3
ID #: 12	Y	-	9	10	13	18	4	4

Summary of Task 30: Modify and Approve an incoming therapeutic pharmacy request

Total Tested	Task Success %	Task Failures %	Task Path Optimal/Observed MEAN	Task Path (SD)	Task Time Optimal/Observed MEAN	Task Time (SD)	Moderator Task Rating MEAN	Participant Task Rating MEAN	Participant Task Rating (SD)
10	100%	0%	9/12	2	13/33	12	2.9	4.1	0.7

Task 31: Review a patients medication history

Task Instructions: Starting from the Patients Demographics tab – Review the patients medication history.

Tester ID #	Effectiveness		Efficiency				Satisfaction	
	Task Success	Task Failures	Task Path Optimal	Task Path Observed	Task Time Optimal	Task Time Observed	Moderator Task Rating	Participant Task Rating
ID #: 1	Y	-	3	6	4	19	3	4
ID #: 2	-	-	-	-	-	-	-	-
ID #: 3	-	-	-	-	-	-	-	-
ID #: 4	Y	-	3	6	4	12	3	5
ID #: 5	Y	-	3	4	4	8	4	5
ID #: 6	Y	-	3	5	4	7	3	5
ID #: 7	Y	-	3	4	4	6	4	5
ID #: 8	Y	-	3	7	4	16	3	5
ID #: 9	Y	-	3	8	4	19	3	5
ID #: 10	Y	-	3	11	4	35	2	4
ID #: 11	Y	-	3	3	4	5	4	5
ID #: 12	Y	-	3	8	4	26	3	5

Summary of Task 31: Review a patients medication history

Total Tested	Task Success %	Task Failures %	Task Path Optimal/Observed MEAN	Task Path (SD)	Task Time Optimal/Observed MEAN	Task Time (SD)	Moderator Task Rating MEAN	Participant Task Rating MEAN	Participant Task Rating (SD)
10	100%	0%	3/6	2	4/15	9	3.2	4.8	0.4

§ 170.315 (b)(3) Electronic Prescribing - Continued

Task 32: Reconcile a patients medication history

Task Instructions: Starting from the Patients medications tab – Change the active prescription status for (ADVAIR) to no longer active.

Tester ID #	Effectiveness		Efficiency				Satisfaction	
	Task Success	Task Failures	Task Path Optimal	Task Path Observed	Task Time Optimal	Task Time Observed	Moderator Task Rating	Participant Task Rating
ID #: 1	Y	-	4	4	7	16	3	5
ID #: 2	-	-	-	-	-	-	-	-
ID #: 3	-	-	-	-	-	-	-	-
ID #: 4	Y	-	4	9	7	23	3	4
ID #: 5	Y	-	4	4	7	14	4	5
ID #: 6	Y	-	4	4	7	9	4	5
ID #: 7	Y	-	4	7	7	19	3	4
ID #: 8	Y	-	4	6	7	14	3	5
ID #: 9	Y	-	4	4	7	11	4	5
ID #: 10	Y	-	4	5	7	16	4	5
ID #: 11	Y	-	4	4	7	7	5	5
ID #: 12	Y	-	4	4	7	13	4	5

Summary of Task 32: Reconcile a patients medication history

Total Tested	Task Success %	Task Failures %	Task Path Optimal/Observed MEAN	Task Path (SD)	Task Time Optimal/Observed MEAN	Task Time (SD)	Moderator Task Rating MEAN	Participant Task Rating MEAN	Participant Task Rating (SD)
10	100%	0%	4/5	2	7/14	4	3.7	4.8	0.4

NOTES:

- 1 – Testers 2 and 3 did not participate for these tests as it was not something they did as part of their job.
- 2 – ADMIN NOTE - Many parts of this set of tasks are new additions to the EMR. With just a crash course in training done prior to testing on the new components the testers did well considering how unfamiliar they had been with these components. The rate of path deviation (getting lost or unsure) and the added time due to thinking about what to do next will improve as it is used more.
- 3 – Testers in general became rather "lost" on this section and took some time to get through it.
- 4 – ADMIN NOTE – For all the new components the testers expressed how useful they will be once implemented. They believe that it will save time in the long run dealing with refills and such.
- 5 – Four Testers tried to view this through the ERx section rather than current med's at first. Both realized that was not correct and backtracked and found the proper path – Logically it made sense to look in that area, Something that may need to be redesigned to improve usability.
- 6 – This section seemed to have the most deviation and time lag resulting in the lowest Efficiency task ratings but the testers still rated it with a rather high Satisfaction rating. Believe this is due to the task not being that complicated or time consuming so once they got on the proper path they then rated it as such.
- 7 – Many testers hesitated with this task but managed to work it out.
- 8 – ADMIN NOTE – ERx in general could be reworked a bit, that would in the long run improve usability and efficiency.

Criticalness Survey and SUS Report Table's

Criticalness Survey Summary

**Frequency between 1-7 users used this function within the Veracity: V-9.1 program.
1= most used to 7= least used**

Function	Mean Score
§ 170.315 (a)(1) Computerized Provider Order Entry (CPOE) – medications	1.1
§ 170.315 (a)(2) CPOE – laboratory	1.75
§ 170.315 (a)(3) CPOE – diagnostic imaging	2.5
§ 170.315 (a)(4) Drug-drug, Drug-allergy Interaction Checks for CPOE	2.3
§ 170.315 (a)(5) Demographics	1.08
§ 170.315 (a)(6) Problem List	1.41
§ 170.315 (a)(7) Medication List	1.5
§ 170.315 (a)(8) Medication Allergy List	1.66
§ 170.315 (a)(9) Clinical Decision Support	6.58
§ 170.315 (a)(14) Implantable Device List	6.41
§ 170.315 (b)(2) Clinical Information Reconciliation and Incorporation	6.66
§ 170.315 (b)(3) Electronic Prescribing	1.2

**Prioritization 1-7 of Veracity: V-9.1 program functions in accordance of risk associated with user errors.
1=Highest risk of a serious user error to 7=Least risk of a serious user error**

Function	Mean Score
§ 170.315 (a)(1) Computerized Provider Order Entry (CPOE) – medications	1.4
§ 170.315 (a)(2) CPOE – laboratory	4.16
§ 170.315 (a)(3) CPOE – diagnostic imaging	4.66
§ 170.315 (a)(4) Drug-drug, Drug-allergy Interaction Checks for CPOE	3.0
§ 170.315 (a)(5) Demographics	4.66
§ 170.315 (a)(6) Problem List	4.5
§ 170.315 (a)(7) Medication List	3.0
§ 170.315 (a)(8) Medication Allergy List	3.08
§ 170.315 (a)(9) Clinical Decision Support	5.91
§ 170.315 (a)(14) Implantable Device List	6.08
§ 170.315 (b)(2) Clinical Information Reconciliation and Incorporation	5.66
§ 170.315 (b)(3) Electronic Prescribing	1.3

Criticalness Survey													
Frequency between 1-7 users used this function within the Veracity: V-9.1 program.													
1= most used to 7= least used													
Function	Tester 1	Tester 2	Tester 3	Tester 4	Tester 5	Tester 6	Tester 7	Tester 8	Tester 9	Tester 10	Tester 11	Tester 12	Mean Score
§ 170.315 (a)(1) Computerized Provider Order Entry (CPOE) – medications	1	N/A	N/A	1	1	1	1	1	1	1	2	1	1.1
§ 170.315 (a)(2) CPOE – laboratory	1	2	1	4	1	1	1	1	1	1	3	4	1.75
§ 170.315 (a)(3) CPOE – diagnostic imaging	2	4	1	3	2	1	7	1	5	1	1	2	2.5
§ 170.315 (a)(4) Drug-drug, Drug-allergy Interaction Checks for CPOE	1	N/A	N/A	2	1	3	2	2	2	4	3	3	2.3
§ 170.315 (a)(5) Demographics	1	1	1	1	1	1	1	1	1	1	1	2	1.08
§ 170.315 (a)(6) Problem List	1	1	2	1	1	1	2	1	2	1	2	2	1.41
§ 170.315 (a)(7) Medication List	1	1	2	1	1	2	2	1	2	1	2	2	1.5
§ 170.315 (a)(8) Medication Allergy List	1	1	3	1	1	2	2	1	2	1	2	3	1.66
§ 170.315 (a)(9) Clinical Decision Support	7	7	7	7	6	7	7	7	6	6	7	5	6.58
§ 170.315 (a)(14) Implantable Device List	7	7	7	7	7	7	7	5	7	7	5	4	6.41
§ 170.315 (b)(2) Clinical Information Reconciliation and Incorporation	7	7	7	7	7	7	7	6	7	6	7	5	6.66
§ 170.315 (b)(3) Electronic Prescribing	1	N/A	N/A	2	1	1	1	1	1	1	2	1	1.2

Prioritization 1-7 of Veracity: V-9.1 program functions in accordance of risk associated with user errors.													
1=Highest risk of a serious user error to 7=Least risk of a serious user error													
Function	Tester 1	Tester 2	Tester 3	Tester 4	Tester 5	Tester 6	Tester 7	Tester 8	Tester 9	Tester 10	Tester 11	Tester 12	Mean Score
§ 170.315 (a)(1) Computerized Provider Order Entry (CPOE) – medications	2	N/A	N/A	1	2	1	1	1	1	2	1	2	1.4
§ 170.315 (a)(2) CPOE – laboratory	3	4	2	4	4	6	4	3	5	4	5	6	4.16
§ 170.315 (a)(3) CPOE – diagnostic imaging	3	5	2	4	4	6	7	3	7	4	5	6	4.66
§ 170.315 (a)(4) Drug-drug, Drug-allergy Interaction Checks for CPOE	2	N/A	N/A	3	3	4	2	3	4	2	3	4	3.0
§ 170.315 (a)(5) Demographics	7	7	6	5	7	7	6	7	7	6	7	7	4.66
§ 170.315 (a)(6) Problem List	3	5	3	5	5	4	3	6	5	4	5	6	4.5
§ 170.315 (a)(7) Medication List	2	4	2	2	3	4	2	3	3	3	3	5	3.0
§ 170.315 (a)(8) Medication Allergy List	2	4	1	2	3	4	2	3	4	3	4	5	3.08
§ 170.315 (a)(9) Clinical Decision Support	5	6	4	7	6	7	7	7	6	7	4	5	5.91
§ 170.315 (a)(14) Implantable Device List	6	7	5	7	7	7	7	6	5	7	5	4	6.08
§ 170.315 (b)(2) Clinical Information Reconciliation and Incorporation	4	6	5	7	5	7	7	7	6	7	4	3	5.66
§ 170.315 (b)(3) Electronic Prescribing	1	N/A	N/A	1	2	1	1	1	1	2	1	2	1.3

The Demographic fields, The 3 lists - Problems, Allergys and Medications, The Lab Order function and the (CPOE) – medications and e-Prescribing functions were found to be the most used of the functions/features being tested. The functions where the users felt the most risk of error was possible was tied between the (CPOE) – medications and the e-Prescribing functions.

System Usability Scale – Tester Table										
	Statement 1	Statement 2	Statement 3	Statement 4	Statement 5	Statement 6	Statement 7	Statement 8	Statement 9	Statement 10
Tester 1	5	2	4	1	4	1	5	1	5	1
Tester 2	5	1	4	2	5	1	4	1	4	1
Tester 3	4	2	4	3	4	3	4	2	4	2
Tester 4	5	2	5	2	4	2	5	2	4	1
Tester 5	5	1	4	2	4	1	5	1	5	2
Tester 6	5	1	5	3	5	2	4	2	4	2
Tester 7	4	1	4	1	5	1	5	1	5	1
Tester 8	5	1	4	3	4	1	4	1	5	1
Tester 9	5	2	4	2	4	1	4	1	5	1
Tester 10	4	3	3	4	3	3	4	3	4	3
Tester 11	5	1	5	2	5	1	5	1	5	2
Tester 12	5	2	4	2	4	1	4	1	4	1
Pre-SUS adjustment average	57/12 4.75	19/12 1.58	50/12 4.16	27/12 2.25	51/12 4.25	18/12 1.5	53/12 4.41	17/12 1.41	54/12 4.5	18/12 1.5
Post-SUS adjustment average	4.75-1 3.75	5-1.58 3.42	4.16-1 3.16	5-2.25 2.75	4.25-1 3.25	5-1.5 3.5	4.41-1 3.41	5-1.41 3.59	4.5-1 3.5	5-1.5 3.5

Total Post-SUS = 33.83 Multiplied by 2.5 = 84.57

System Usability Score: 84.57%

Where broadly interpreted, scores under 60.00% represent systems with poor usability; scores over 80.00% would be considered above average.

Recap of Major Findings

The Veracity: V-9.1 EHR program performed as expected. The only main areas of concern are reducing the click rate for many of the tasks to further improve the ease of use and improve the speed tasks can be completed. Also to improve the search capabilities on the Medications List and the Allergies List as this was the area most users experienced a reduction of efficiency and caused some to deviate from the normal path of task completion. This information was passed on to our engineering department to further investigate.