EHR Usability Test Report of MedTrioEHR version 7.2034

Report based on ISO/IEC 25062:2006 Common Industry Format for Usability Test Reports

MedTrioEHR™ version 7.2034
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Table of Contents

1 EXECUTIVE SUMMARY

A usability test of MedTrioEHR, version 7.2034, was conducted on February 5-19, 2020, at MedTrio's offices in Little Rock, AR. The purpose of this test was to test and validate the usability of the current user interface, and provide evidence of usability in the EHR Under Test (EHRUT). During the usability test, two healthcare providers, four medical assistants, and four administrative users served as participants and used the EHRUT in simulated, but representative tasks.

This study collected performance data on 12 tasks, all of which are typically conducted on an EHR:

1. Computerized provider order entry (CPOE) – medications. Enable a user to record, change, and access medication orders. Optional: Include a "reason for order" field.
2. Computerized provider order entry (CPOE) – laboratory. Enable a user to record, change, and access laboratory orders. Optional: Include a "reason for order" field.
3. Computerized provider order entry (CPOE) – diagnostic imaging. Enable a user to record, change, and access diagnostic imaging orders. Optional: Include a "reason for the order" field.
4. Drug-drug, drug-allergy interaction checks for CPOE
5. Enable a user to record, change, and access patient demographic data including race, ethnicity, preferred language, sex, sexual orientation, gender identity, and date of birth.
6. Problem list. Enable a user to record, change, and access patient active problem list that has been created over multiple encounters.
7. Enable a user to record, change, and access patient active medications list as well as medication history.
8. Enable a user to record, change, and access patient active medications allergy list as well as medication allergy history.
9. Interventions provided to a user must occur when a user is interacting with the technology based on (A) problem list, (B) medications list, (C) medication allergy list, (D) demographics specified in 170.315(a)(5), (E) laboratory test, and (F) vitals.
10. User records unique device identifiers associated with a patient's implantable devices.
11. Incorporate clinical information.
12. Electronically prescribe medications.

During the 45-minute one-on-one usability test, each participant was greeted by the administrator and asked to review and sign an informed consent/release form (included in Appendix 3); they were instructed that they could withdraw at any time. Participants did not have prior experience with the EHR. The administrator introduced the test, and instructed participants to complete a series of tasks (given one at a time) using the EHRUT. During the testing, the administrator timed the test and recorded user performance data on paper. The administrator did not give the participant assistance in how to complete the task.

The following types of data were collected for each participant:
• Number of tasks successfully completed within the allotted time without assistance
• Time to complete the tasks
• Number and types of errors
• Path deviations
• Participant's verbalizations
• Participant's satisfaction/usability ratings of the system

All participant data was de-identified – no correspondence could be made from the identity of the participant to the data collected. Following the conclusion of the testing, participants were asked to complete a post-test questionnaire and were not compensated for their time in order to keep the study

completely nonbiased. Various recommended metrics, in accordance with the examples set forth in the NIST Guide to the Processes Approach for Improving the Usability of Electronic Health Records, were used to evaluate the usability of the EHRUT.

The results from the System Usability Scale scored the subjective satisfaction with the system based on performance with these tasks to be: 4.8
In addition to the performance data, the following qualitative observations were made:
- Major findings: the software is very usable with minimal training for medical professionals with prior experience using EHR systems
- Areas for improvement: better labeling is needed; when possible standardize the locations of all navigation buttons.

2 INTRODUCTION

The EHRUT tested for this study was MedTrioEHR version 7.2034. Designed to present medical information to healthcare providers in ambulatory clinics, the EHRUT consists of a browser-based application for all functions except electronic prescribing, which is provided by a third party, but is fully integrated. The usability testing attempted to represent realistic exercises and conditions, and allow the user to personalize their screens for maximum efficiency (not a typical feature in any EHR product).

The purpose of this study was to test and validate the usability of the current user interface, and provide evidence of usability in the EHR Under Test (EHRUT). To this end, measures of effectiveness, efficiency and user satisfaction, such as adjusting/customizing screens, finding patient info, prescribing medications, ordering tests and reconciling data, were captured during the usability testing.

3 METHOD

3.1 Participants
A total of ten (10) participants were tested on the EHRUT. Participants in the test were: three (3) medical office administrative workers, four (4) medical assistants, one (1) physician, one (1) nurse practitioner, and one (1) administrator. Participants were recruited by MedTrio and were NOT compensated for their time. In addition, participants had no direct connection to the development of or organization producing the EHRUT(s). Participants were not from the testing or supplier organization. Participants were given the opportunity to have the same orientation and level of training as the actual end users would have received.

Recruited participants had a mix of backgrounds and demographic characteristics conforming to the recruitment screener. The following is a table of participants by characteristics, including demographics, professional experience, computing experience and user needs for assistive technology. Participant names were replaced with Participant IDs so that an individual's data cannot be tied back to individual identities.

ID#	SEX	AGE	EDUCATION	OCCUPAT/ROLE	PROFESSIONAL EXPERIENCE	COMPUTER EXPERIENCE	PRODUCT EXPERIENCE	ASSISTIVE TECHNOLOGY NEEDS
P1	F	31	Associates Degree	Admin/billing clerk	134 months	117 months	0 months	none
P2	F	34	Associates Degree	Medical assistant	158 months	97 months	0 months	none
P3	M	59	Medical Doctor	Physician	243 months	183 months	0 months	none
P4	F	28	Associates Degree	Medical assistant	88 months	88 months	0 months	none
P5	F	57	Associates Degree	Medical assistant	279 months	238 months	0 months	none
P6	F	32	Masters Degree	Nurse Practitioner	75 months	175 months	0 months	none
P7	F	24	Associates Degree	Medical assistant	39 months	90 months	0 months	none

P8	F	28	High School Graduate	Receptionist	98 months	136 months	0 months	none
P9	F	28	Associates Degree	Receptionist	111 months	166 months	0 months	none
P10	F	56	Associates Degree	Administrator	340 months	346 months	0 months	none

Ten participants were recruited and participated in the usability test.

Participants were scheduled for one 45-minute session. Each test occurred on separate days allowing plenty of time for debriefing by the administrator and to reset systems to proper test conditions. A spreadsheet was used to keep track of the participant schedule, and included each participant's demographic characteristics. Audio recordings were made to accurately capture each participant's comments.

3.2 STUDY DESIGN
Overall, the objective of this test was to uncover areas where the application performed well – that is, effectively, efficiently, and with satisfaction – and areas where the application failed to meet the needs of the participants. The data from this test 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.

During the usability test, participants interacted with a single EHR. Each participant used the system in the same location, and was provided with the same instructions. The system was evaluated for effectiveness, efficiency and satisfaction as defined by measures collected and analyzed for each participant:

• Number of tasks successfully completed within the allotted time without assistance
• Time to complete the tasks
• Number and types of errors
• Path deviations
• Participant's verbalizations (comments)
• Participant's satisfaction ratings of the system

Additional information about the various measures can be found in Section 3.9 on Usability Metrics.

3.3 TASKS
A number of tasks were constructed that would be realistic and representative of the kinds of activities a user might do with this EHR, including:

1. Using the EHR, order medications[170.315(a)(1)]
2. Order a lab test and then change this test [170.315(a)(2)]
3. Order a diagnostic test and then change this test [170.315(a)(3)]
4. Order a medication and review contraindications [170.315(a)(4)]
5. Update a patient's demographics (race, language, ethnicity, et al) [170.315(a)(5)]
6. Add a new problem to a patient's active problem list [170.315(a)(6)]
7. Order a medication and change another medication [170.315(a)(7)]
8. Record a medication allergy and change another medication allergy [170.315(a)(8)]

9. Note clinical decision support interventions [170.315(a)(9)]
10. Record unique device identifiers for implantable devices [170.315(a)(14)]
11. Import clinical information [170.315(b)(2)]

Tasks were selected based on their frequency of use, criticality of function, and those that may be most troublesome for users.

3.4 PROCEDURES
Upon arrival, participants were greeted; their identity was verified and matched with a name on the participant schedule. Participants were then assigned a participant ID. Each participant reviewed and signed an informed consent and release form (See Appendix 2). A representative from the test team witnessed the participant's signature.

A single administrator conducted the tests. This administrator has extensive experience—more than 30 years—in software development and user training. The administrator moderated the session including administering instructions and tasks. The administrator also monitored task times, obtained post-task rating data, and took notes on participant comments.

Participants were instructed to perform the tasks:

• As quickly as possible making as few errors and deviations as possible.
• Without assistance; administrator was allowed to give immaterial guidance and clarification on tasks, but not instructions on use.
• Without using a think aloud technique.

For each task, the participants were given a written copy of the task. Task timing began once the administrator finished reading the question. The task time was stopped once the participant indicated they had successfully completed the task. Scoring is discussed below in Section 3.10.
Following the session, the administrator gave the participant the post-test questionnaire (e.g., the System Usability Scale, see Appendix 4) and thanked each individual for their participation.

Participants' demographic information, task success rate, time on task, errors, deviations, verbal responses, and post-test questionnaire were recorded into a spreadsheet. Participants were thanked for their time, but were not compensated.

3.5 TEST LOCATION
The test facility was a quiet, private conference room at MedTrio's business office, which is a typical business office suite with receptionist, meeting room and private offices occupying a portion of a multi-tenant/multi-story building. Only the participant and administrator/data logger were in the test room. To ensure that the environment was comfortable for users, noise levels were kept to a minimum with the ambient temperature within a normal range. All of the safety instruction and evacuation procedures were valid, in place, and visible to the participants.

3.6 TEST ENVIRONMENT
The testing was conducted at MedTrio's offices. For testing, the computer used was a Lenovo personal computer with 19-inch TFT monitor (WXGA resolution with SRGB color settings) running Windows operating system and the Chrome web browser. The PC was connected to a local area network (LAN) with category-5 ethernet cable, and internet connection via DSL service. The participants used a standard 101-key keyboard and Logitech mouse when interacting with the EHRUT.

The application was set up by MedTrio according to standard configuration on a white box Intel server (Xeon processor with 16 GB of RAM) with Ubuntu linux operating system. The application server is off-

site at MedTrio's secure hosting facility and accessed via a WAN connection. The application was running on a testing database. Technically, the system performance was representative to what actual users would experience in a field implementation. Additionally, participants were unable to change any of the default system settings.

3.7 TEST FORMS AND TOOLS
During the usability test, various documents and instruments were used, including:
1. Informed Consent
2. Moderator's Guide
3. Post-test Questionnaire

Examples of these documents can be found in Appendices 2-4, respectively.

3.8 PARTICIPANT INSTRUCTIONS

The administrator reads the following instructions aloud to the each participant (also see the full moderator's guide in Appendix 3):

We at MedTrio want to thank you for your participation in this study as it was initially explained to you. The duration of the session today is not expected to exceed thirty minutes, and in that time you will briefly explore an electronic health record (EHR) system.

Using this EHR system you will be given eleven tasks to perform and also answer some questions. The main focus will be on how easy or difficult the system is to use and if this system would be useful to you and what improvements could be made for usability. You should complete these tasks on your own as quickly as possible and with a minimum of errors and deviations. If you have difficulties I cannot help you with anything that concerns the system itself. Please save your comments and questions until the end of a task session or at the end of the whole tasks session in which we can then discuss any items or concerns that you may have.

Please be honest with your opinions as the main goal is to improve the system. The product you will be using today is in its fifth year of production and has been written in conjunction with the new way of interoperability and standards in mind. Improvements are continually being made by the feedback from the EHR users. Please keep in mind that the data used here today is test data and may not always make as much sense as live data. All of the information that you have provided will be kept confidential including your name so that any comments you made will not be associated to you.

Are there any questions at this point?

Following the procedural instructions, participants were shown the EHR and as their first task, were given time (15 minutes) to explore the system and make comments. Once this task was complete, the administrator gave the following instructions:

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 not talk aloud or verbalize while you are doing the tasks. I will ask you your impressions about the task once you are done.

Participants were then given 12 tasks to complete. Tasks are listed in the moderator's guide in Appendix 3.

3.9 USABILITY METRICS

According to the NIST Guide to the Processes Approach for Improving the Usability of Electronic Health Records, 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 effectively, efficiently, and with an acceptable level of satisfaction. To this end, metrics for effectiveness, efficiency and user satisfaction were captured during the usability testing. The goals of the test were to assess:

1. Effectiveness of MedTrioEHR by measuring participant success rates and errors
2. Efficiency of MedTrioEHR by measuring the average task time and path deviations
3. Satisfaction with MedTrioEHR by measuring ease of use ratings

3.10 DATA SCORING

The following table details how tasks were scored, errors evaluated, and the time data analyzed.

MEASURES	RATIONALE AND SCORING
EFFECTIVENESS: TASK SUCCESS	A task was counted as a "Success" if the participant was able to achieve the correct outcome, without assistance, within the time allotted on a per task basis. The total number of successes were calculated for each task and then divided by the total number of times that task was attempted. The results are provided as a percentage. Task times were recorded for successes. Observed task times divided by the time for each task is a measure of optimal efficiency. Optimal task performance time, as benchmarked by expert performance under realistic conditions, is recorded when constructing tasks. Target task times used for task times in the Moderator's Guide must be operationally defined by taking multiple measures of optimal performance and multiplying by some factor [e.g., 1.5] that allows some time buffer because the participants are presumably not trained to expert performance. Thus, if expert, optimal performance on a task was [x] seconds then allotted task time performance was [x * 1.5] seconds.
EFFECTIVENESS: TASK FAILURE	If the participant abandoned the task, did not reach the correct answer or performed it incorrectly, or reached the end of the allotted time before successful completion, the task was counted as a "Failures." No task times were taken for errors.
EFFICIENCY: TASK DEVIATIONS	The participant's path (i.e., steps) through the application was recorded via screen capture software. Deviations occur if the participant, for example, went to a wrong screen, clicked on an incorrect menu item, followed an incorrect link, or interacted incorrectly with an on-screen control. This path was compared to the optimal path. The number of steps in the observed path is divided by the number of optimal steps to provide a ratio of path deviation.
EFFICIENCY: TASK TIME	Each task was timed from when the administrator said "Begin" until the participant said, "Done." If he or she failed to say "Done," the time was stopped when the participant stopped performing the task. Only task times for tasks that were successfully completed were included in the average task time analysis. Average time per task was calculated for each task.
SATISFACTION: TASK RATING	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. After each task, the participant was asked to rate "Overall, this task was:" on a scale of 1 (Very Difficult) to 5 (Very Easy). These data are averaged across participants.

TEST	SATISFACTION/TASK RATING											
	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	AVERAGE	
Task 1	4	5	5	4	5	4	4	5	5	5	4.6	
Task 2	4	5	4	5	5	5	5	5	4	5	4.7	
Task 3	4	5	5	4	4	5	4	5	5	5	4.6	
Task 4	5	5	5	5	4	5	4	5	5	5	4.8	
Task 5	4	5	4	5	5	5	5	5	5	5	4.8	
Task 6	5	5	4	5	5	4	5	5	5	5	4.8	
Task 7	4	4	5	5	5	5	4	5	5	5	4.7	
Task 8	4	5	5	5	5	5	5	4	5	5	4.8	
Task 9	5	5	5	5	5	5	5	5	5	5	5.0	
Task 10	5	5	5	5	5	5	5	5	5	5	5.0	
Task 11	5	4	5	5	5	5	5	5	5	5	4.9	
AVERAGE:	4.5	4.8	4.7	4.8	4.8	4.8	4.6	4.9	4.9	5.0	4.8	

4 RESULTS

4.1 DATA ANALYSIS AND REPORTING
The results of the usability test were calculated according to the methods specified in the Usability Metrics section above. All participants followed instructions so no data was excluded. No irregularities were noted. The usability testing results for the EHRUT are detailed below.

TASK/MEASURE	N	TASK SUCCESS	PATH DEVIATION	TASK TIME			ERRORS	TASK RATINGS 5=Easy
	#	Mean (SD)	Observed/ Optimal	Mean	SD	Optimal	Mean (SD)	Mean (SD)
CPOE 170.315(a)(1)	10	100% (0.0)	1 (51/50)	35	12	15	0.33 (0.6)	4.6 (0.52)
CPOE 170.315(a)(2)	10	100% (0.0)	1 (31/30)	29	14	15	0 (0.0)	4.7 (0.48)
CPOE 170.315(a)(3)	10	100% (0.0)	1 (31/30)	29	13	15	0 (0.0)	4.6 (0.52)
Interactions 170.315(a)(4)	10	100% (0.0)	0 (30/30)	14	6	8	0 (0.0)	4.8 (0.42)
Demographics 170.315(a)(5)	10	100% (0.0)	0 (20/20)	27	9	20	.33 (0.6)	4.8 (0.42)
Problem List 170.315(a)(6)	10	100% (0.0)	2 (22/20)	25	16	9	.33 (0.6)	4.8 (0.42)
Medication List 170.315(a)(7)	10	100% (0.0)	0 (30/30)	21	5	12	.33 (0.6)	4.7 (0.48)
Medication Allergy 170.315(a)(8)	10	100% (0.0)	0 (30/30)	20	9	8	.33 (0.6)	4.8 (0.42)
CDSI 170.315(a)(9)	10	100% (0.0)	0 (20/20)	17	4	10	.33 (0.6)	5.0 (0.0)
Device Identifiers 170.315(a)(14)	10	100% (0.0)	0 (20/20)	15	2	10	.33 (0.6)	5.0 (0.0)
Clinical Info 170.315(b)(2)	10	100% (0.0)	0 (40/40)	16	3	10	.33 (0.6)	4.9 (0.32)

The results from the System Usability Scale (SUS) scored the subjective satisfaction with the system based on performance with these tasks to be **96%**, which scores as above average.

4.2 DISCUSSION OF THE FINDINGS
EFFECTIVENESS:
1. All tasks were completed successfully.
EFFICIENCY:

1. Few deviations were noted, and none were more than one step in error (the user immediately realized they made the wrong choice and quickly corrected themselves).

SATISFACTION:

1. Lowest score was a "3" on a total of 2 tasks. Overall average of satisfaction scores is 4.8.

MAJOR FINDINGS:

1. All tasks were completed successfully with few deviations.
2. All deviations were the same—simple incorrect choices from misunderstood labels.
3. All users commented that the software was extremely easy to use and very fast.

AREAS FOR IMPROVEMENT:

1. One participant noted that help screens were not present for all screens, and some were outdated. Constant, rapid development for new specialties and MIPS/MACRA are the cause and will be corrected within 90 days.
2. There are inconsistencies with the use of icons and buttons: 1) icons are usually labelled but not always; 2) multiple Report and Help icons should be combined into one per screen; 3) more consistency is needed in terminology (Close vs. Return, Delete vs Remove).

5 APPENDICES

The following appendices include supplemental data for this usability test report. Following is a list of the appendices provided:

1: Participant demographics
2: Non-Disclosure Agreement (NDA) and Informed Consent Form
3: Example Moderator's Guide
4: System Usability Scale Questionnaire
5: UCD Attestation

5.1 APPENDIX 1: PARTICIPANT DEMOGRAPHICS

Overview of the participants:

Participant Demographics

CATEGORY	COUNT
GENDER	
Men	1
Women	9
TOTAL:	10
OCUPATION/ROLE	
Physician	2
Nurse/medical assistant	4
Admin	4
TOTAL:	10
YEARS OF EXPERIENCE	
Always used paper records	78
Always used EHR	35
Used both paper and EHR	6
TOTAL:	119

5.2 APPENDIX 2: NON-DISCLOSURE AGREEMENT AND INFORMED CONSENT

Non-Disclosure Agreement

THIS AGREEMENT is entered into as of FEBRUARY _____, between _____ ("the Participant") and the testing organization, Medtrio, Inc. ("Test Company") located at 650 S. Shackleford Rd, Suite 400, Little Rock, AR 72211.

The Participant acknowledges his or her voluntary participation in today's usability study may bring the Participant into possession of Confidential Information. The term "Confidential Information" means all technical and commercial information of a proprietary or confidential nature which is disclosed by Test Company, or otherwise acquired by the Participant, in the course of today's study.

By way of illustration, but not limitation, Confidential Information includes trade secrets, processes, formulae, data, know-how, products, designs, drawings, computer aided design files and other computer files, computer software, ideas, improvements, inventions, training methods and materials, marketing techniques, plans, strategies, budgets, financial information, or forecasts.

Any information the Participant acquires relating to this product during this study is confidential and proprietary to Test Company and is being disclosed solely for the purposes of the Participant's participation in today's usability study. By signing this form the Participant acknowledges that s/he will not receive monetary compensation for feedback and will not disclose this confidential information obtained today to anyone else or any other organizations.

Participant's printed name: _____

Signature: _____ Date: _____

Informed Consent

MedTrio, Inc. would like to thank you for participating in this study. The purpose of this study is to evaluate an electronic health records system. If you decide to participate, you will be asked to perform several tasks using the prototype and give your feedback. The study will last about 30 minutes. At the conclusion of the test.

Agreement
I understand and agree that as a voluntary participant in the present study conducted by MedTrio, Inc.

I am free to withdraw consent or discontinue participation at any time. I understand and agree to participate in the study conducted and videotaped by MedTrio, Inc.

I understand and consent to the use and release of the videotape by MedTrio. I understand that the information and videotape is for research purposes only and that my name and image will not be used for any purpose other than research. I relinquish any rights to the videotape and understand the videotape may be copied and used by MedTrio, Inc. without further permission.

I understand and agree that the purpose of this study is to make software applications more useful and usable in the future.

I understand and agree that the data collected from this study may be shared outside of MedTrio, Inc. and MedTrio's client. I understand and agree that data confidentiality is assured, because only de-identified data – i.e., identification numbers not names – will be used in analysis and reporting of the results.

I agree to immediately raise any concerns or areas of discomfort with the study administrator. I understand that I can leave at any time.

Please check one of the following:

❏ YES, I have read the above statement and agree to be a participant.
❏ NO, I choose not to participate in this study.

Signature: _____ Date: _____

5.3 APPENDIX 3: EXAMPLE MODERATOR'S GUIDE

Orientation (15 minutes)

We at MedTrio want to thank you for your participation in this study as it was initially explained to you. The duration of the session today is not expected to exceed thirty minutes, and in that time you will briefly explore an electronic health record (EHR) system.

Using this EHR system you will be given eleven tasks to perform and also answer some questions. The main focus will be on how easy or difficult the system is to use and if this system would be useful to you and what improvements could be made for usability. You should complete these tasks on your own as quickly as possible and with a minimum of errors and deviations. If you have difficulties I cannot help you with anything that concerns the system itself. Please save your comments and questions until the end of a task session or at the end of the whole tasks session in which we can then discuss any items or concerns that you may have.

Please be honest with your opinions as the main goal is to improve the system. The product you will be using today is in its fifth year of production and has been written in conjunction with the new way of interoperability and standards in mind. Improvements are continually being made by the feedback from the EHR users. Please keep in mind that the data used here today is test data and may not always make as much sense as live data. All of the information that you have provided will be kept confidential including your name so that any comments you made will not be associated to you.

Are there any questions at this point?

Usability test instructions for participants:

1. Find the patient named "Billi Rubin." Record (add/order) "Benicar 40mg" and record directions (SIG) of "1 po bid"; then change the directions to "2 po bid". Then clear the patient, and access the same medication for this same patient. Also, record the reason for the ordered medication. [170.315(a)(1)]

2. While still using patient "Billi Rubin," record (add/order) a lab test "CBC". Then clear the patient, and access the same laboratory order for this same patient, and change the order to "CMP". Also, record the reason for the ordered "CMP". [170.315(a)(2)]

3. Find the patient named "George Jones." For this patient record (add/order) a "Colonoscopy". Then clear the patient, and access the same diagnostic imaging order for this same patient, and change the order to "Mammogram". Also, record the reason for the ordered diagnostic imaging. [170.315(a)(3)]

4. Find patient "Amy G. Dala" and record (add/order) a prescription for "Eliquis 5mg tablet." Identify the automatic drug-drug and drug-allergy contraindication intervention based on the patient's active medication list. [170.315(a)(4)]

5. Find the patient numbered 12362. Change the demographics and input (A) two races, (B) two ethnicities, (C) preferred language, (D) sex, (E) sexual orientation, (F) gender identity (using the appropriate §170 standard responses given within the drop down list), and date of birth. Lastly, for A, B, C, E, and F from above, mark that the patient declined to answer. [170.315(a)(5)]

6. Find the patient named "Johnny Smith." Access the patient's problem list, and add a new problem to the list. Also change an existing problem on the list, such as change the date of service. [170.315(a)(6)]

7. Find patient number "100" and access the patient's medications list and medications full history, then record (add) a new medication to the list. Then change a medication on the list. [170.315(a)(7)]

8. Find patient number "100" and access the patient's medications allergy list and medications allergy full history, then record (add) a new medication allergy. Next change a medication allergy on the active medications allergy list. [170.315(a)(8)]

9. Find patient number "100." Point out the clinical decision support interventions based upon (A) problem list, (B) medications list, (C) medication allergy list, (D) demographics (race, language, ethnicity, sex, gender identity, and sexual orientation), (E) laboratory test, and (F) vitals. [170.315(a)(9)]

10. Find patient number "300." Enter (record) the implantable device from this label (hand participant the label) and record the information in the appropriate format as indicated by the three UDI (Unique Device Identifier) agencies. [170.315(a)(14)]

11. Find patient number "2205" and verify that the patient does not have clinical content on the medication list, allergy, and problem list. Next import the CCDA and verify that the data from the CCDA has been imported and now available in the patient's summary chart. [170.315(b)(2)]

12. Find patient number "100." Assign a pharmacy, prescribe the medication Procardia 10mg with a SIG, pharmacy notes, and a reason for prescription. Next review interactions, allergies, contraindications, formularies, and any other clinical decision support notes. Send it electronically. Now cancel the prescription. Last, check the Message Portal for pharmacy refills/renewals and reject at least one, and accept at least one. [170.315(b)(3)]

5.4 APPENDIX 4: SYSTEM USABILITY SCALE QUESTIONNAIRE

1. The system was very intuitive

				P1 P2 P3 P4 P5 P6 P7 P8 P9 P10
1	2	3	4	5

Strongly
disagree   Strongly agree

2. The system would require a lot of training

P2 P3 P4 P6 P8 P9 P10	P1 P5	P7		
1	2	3	4	5

Strongly disagree   Strongly agree

3. System functions were very integrated

				P1 P2 P3 P4 P5 P6 P7 P8 P9 P10
1	2	3	4	5

Strongly disagree   Strongly agree

4. The system operation was very inconsistent

P1 P2 P3 P4 P5 P6 P7 P8 P9 P10				
1	2	3	4	5

Strongly disagree   Strongly agree

5. I became self-assured very quickly

		P7	P1 P5	P2 P3 P4 P6 P8 P9 P10
1	2	3	4	5

Strongly
disagree   Strongly agree

6. I had to build up knowledge of the system before continuing tasks

P2 P3 P4 P6 P8 P9 P10	P1 P5	P7		
1	2	3	4	5

Strongly disagree   Strongly agree

7. The system would be easy to learn

				P1 P2 P3 P4 P5 P6 P7 P8 P9 P10
1	2	3	4	5

Strongly
disagree   Strongly agree

8. The system was inconvenient and awkward to use

P1 P2 P3 P4 P5 P6 P7 P8 P9 P10				
1	2	3	4	5

Strongly disagree   Strongly agree

9. I would like to use this system

				P1 P2 P3 P4 P5 P6 P7 P8 P9 P10
1	2	3	4	5

Strongly
disagree   Strongly agree

10. The system was very complex with unnecessary steps

P1 P2 P3 P4 P5 P6 P7 P8 P9 P10				
1	2	3	4	5

Strongly disagree   Strongly agree

SUS SCORES:

Participant 1: 45 * 2.0 =   90.0
Participant 2: 50 * 2.0 =   100.0
Participant 3: 50 * 2.0 =   100.0
Participant 4: 50 * 2.0 =   100.0
Participant 5: 45 * 2.0 =   90.0
Participant 6: 50 * 2.0 =   100.0
Participant 7: 40 * 2.0 =   80.0
Participant 8: 50 * 2.0 =   100.0
Participant 9: 50 * 2.0 =   100.0
Participant 10: 50 * 2.0 =   100.0
  AVERAGE: 96.0

5.5 APPENDIX 4: USER-CENTERED DESIGN (UCD) ATTESTATION

ISO 9241-11 was used in all capabilities under test. UCD processes used in the development of the MedTrioEHR, version 12.0328, were in accordance with **ISO 9241-11, Ergonomic requirements for office work with visual display terminals (VDTs) — Part 11: Guidance on usability**, found at https://www.iso.org/obp/ui/#iso:std:16883:en