

EHR Usability Test Report of Chiro8000 v16

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

Chiro8000 v16

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EXECUTIVE SUMMARY

A usability test of Chiro8000 v16 was conducted between April 1-3, 2019 in El Dorado Hills, CA by Forté Holdings Inc.. 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, 5 healthcare providers matching the target demographic criteria served as participants and used the EHRUT in simulated, but representative tasks

The study collected performance data on tasks typically conducted on an EHR. Each task relates to the following 2015 edition ONC criteria:

1. ONC 170.315(a)(1) CPOE-Medications
2. ONC 170.315(a)(2)–Computerized Provider Order Entry (CPOE) - Laboratory
3. ONC 170.315(a)(3)–Computerized Provider Order Entry (CPOE) – Diagnostic Imaging
4. ONC 170.315(a)(4)–Drug-drug, Drug-allergy Interaction Checks
5. ONC 170.315(a)(5)-Demographics
6. ONC 170.315(a)(6)-Problem List
7. ONC 170.315(a)(7)-Medication List
8. ONC 170.315(a)(8)-Medication Allergy List
9. ONC 170.315(a)(9)-Clinical Decision Support
10. ONC 170.315(a)(14)-Implantable Device List
11. ONC 170.315(b)(2)-Clinical Information Reconciliation and Incorporation
12. ONC 170.315(b)(3)-E-Prescribing

During the 90 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 have prior experience with the EHR. Participants were given the opportunity to complete training similar to what a real end user would receive prior to participating in the usability test. The training consisted of a detailed live webinar titled 'RightFit Training' to walk the client through the setup and use of the program and given access to the user manual to supplement the training. 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, along with the data logger(s) recorded user performance data on paper and electronically. The administrator did not give the participant assistance in how to complete the task.

Participant screens, head shots and audio were recorded for subsequent analysis. User tasks were prioritized in accordance with the risk associated with user errors. 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 ratings of the system
- Risk scale assessment

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. 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. Following is a summary of the performance and rating data collected on the EHRUT.

Task	Measure	N	Task Success	Path Deviation	Task Time		Errors	Task Ratings 100=Easy	Task Risk (1 least risky-5 rskiest)
					Mean (SD)	Deviations (Observed / Optimal)			
1.ONC CPOE-Medications	170.315(a)(1)	10	100%	6.6/4.6	100.6 seconds	85.6/88.3	1.3	88.3	1
2.ONC Computerized Provider Order Entry (CPOE) - Laboratory	170.315(a)(2)	10	86.6%	5.3/4.6	106.6 seconds	106.6/85.0	1.6	81.3	2
3.ONC Computerized Provider Order Entry (CPOE) - Diagnostic Imaging	170.315(a)(3)	10	83.3%	14.6/4.6	106.3 seconds	106.3/78.0	2.3	76.6	3
4.ONC Drug-drug, Drug-allergy Interaction Checks	170.315(a)(4)	10	63.3%	9.6/6.0	123.3 seconds	123.3/90.0	4.3	70.0	5
5.ONC Demographics	170.315(a)(5)	10	100%	4.6/4.6	78.3 seconds	78.3/68.3	0.0	95.0	1
6.ONC Problem List	170.315(a)(6)	10	100%	3.5/3.5	71.2 seconds	71.25/65.0	0.0	96.5	1
7.ONC Medication List	170.315(a)(7)	10	100%	3.5/3.5	77.5 seconds	77.5/70.0	0.0	91.25	1
8.ONC Medication Allergy List	170.315(a)(8)	10	100%	3.5/3.5	77.5 seconds	77.5/70.0	0.0	91.25	1
9.ONC Clinical Decision Support	170.315(a)(9)	10	78%	9.4/6.2	133.0 seconds	133/112.0	3.8	80.0	3
10.ONC Implantable Device List	170.315(a)(14)	10	93.3%	5.6/4.6	76.6 seconds	76.6/63.3	1.6	83.3	2
11.ONC Clinical Information Reconciliation and Incorporation	170.315(b)(2)	10	75%	6.5/4.5	137.5 seconds	137.5/67.5	7.5	80.0	4
12.ONC E-Prescribing	170.315(b)(3)	0	0.0%	0/10.1	0.0 seconds	0.0/180	0.0	0.0	5

The results from the System Usability Scale scored the subjective satisfaction with the system based on performance with these tasks to an average of 77.7.

The following qualitative observations were made:

Major findings

- Users found the triggering CDS task confusing
- Several users encountered errors when entering diagnostic imaging
- A participant requested more open templates or macros

Areas for improvement

- Simplify the CDS process as many were confused
- Send the product back to the quality assurance team to resolve all bugs before it goes live to public

INTRODUCTION

The EHRUT(s) tested for this study was Chiro8000 v16 ambulatory EHR. Designed to present medical information to healthcare providers in ambulatory setting most notably chiropractic offices, the EHRUT consists of a template based structure built on a Microsoft SQL database. The usability testing attempted to represent realistic exercises and conditions.

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 [list some specific metrics time on task were captured during the usability testing.

METHOD

PARTICIPANTS

A total of 10 participants were tested on the EHRUT(s). Participants in the test were chiropractors, chiropractic office managers or assistants. Participants were recruited by Josh Nation 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.

For the test purposes, end-user characteristics were identified and translated into a recruitment screener used to solicit potential participants; an example of a screener is provided in Appendix [1].

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.

Participant ID	Gender	Age	Education	Occupation	Professional Experience	Computer Experience	Product Experience
ID01	Female	31	Associates	Chiropractic Assistant	12 years	14 years	4 years
ID02	Female	45	Bachelors	Office Manager	22 years	20 years	15 years
ID03	Female	48	Bachelors	Office Manager	24 years	28 years	13 years
ID04	Male	Not provided	Masters	Chiropractor	22 years	22 years	8 years
ID05	Male	52	Masters	Chiropractor	16 years	25 years	10 years
ID06	Female	19	High School	Office Assistant	1 year	9 years	1 year
ID07	Male	65	Masters	Chiropractor	39 years	7 years	7 years
ID08	Male	28	Associates	Office Biller	6 years	15 years	4 years
ID09	Female	55	Masters	Chiropractor	20 years	22 years	10 years
ID10	Male	25	Associates	Chiropractic Assistant	1year	10 years	1 year

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 1 EHR(s). 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
- Participant's satisfaction ratings of the system

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:

- Find most recent chart notes in Patient Summary screen
- Use patient chart to find last month's lab results
- Check vital signs and record their data
- Check medication allergies for an existing patient
- Enter current medications for a new patient
- Review radiology on an existing patient
- Create a CCDA for an existing patient

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

RISK SCALE

User tasks were prioritized in accordance with the risk associated with user errors. On a scale of 1-5, with 1 being least risky and 5 being the riskiest, here is the following rating:

Task	Measure	N	Task Risk (1 least risky-5 riskiest)
		#	
1.ONC CPOE-Medications	170.315(a)(1)	10	1
5.ONC Demographics	170.315(a)(5)	10	1
6.ONC Problem List	170.315(a)(6)	10	1
7.ONC Medication List	170.315(a)(7)	10	1
8.ONC Medication Allergy List	170.315(a)(8)	10	1
10.ONC Implantable Device List	170.315(a)(14)	10	2
2.ONC Computerized Provider Order Entry (CPOE) - Laboratory	170.315(a)(2)	10	2
3.ONC Computerized Provider Order Entry (CPOE) - Diagnostic Imaging	170.315(a)(3)	10	3
9.ONC Clinical Decision Support	170.315(a)(9)	10	3
11.ONC Clinical Information Reconciliation and Incorporation	170.315(b)(2)	10	4
4.ONC drug, drug-allergy Interaction Checks	170.315(a)(4)	10	5
12.ONC Prescribing	170.315(b)(3)-E	0	5

PROCEDURES

Upon arrival, participants were greeted; their identity was verified and matched with a name on the participant schedule. Each participant reviewed and signed an informed consent and release form (See Appendix 3). A representative from the test team witnessed the participant's signature.

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 (see specific instructions below):

- As quickly as possible making as few errors and deviations as possible.
- Without assistance; administrators were allowed to give immaterial guidance and clarification on tasks, but not instructions on use.

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.

Following the session, the administrator gave the participant the post-test questionnaire 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.

TEST LOCATION

The test facility included a waiting area and room with a table and computer for the participant. Only the participant and administrator 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.

TEST ENVIRONMENT

The EHRUT would be typically be used in a healthcare office or facility. In this instance, the testing was conducted in a regular business office conference room. For testing, the computer used a standard 2019 PC running Windows 10. The participants used mouse and keyboard when interacting with the EHRUT. The [EHRUT] used a Dell 27 inch TV as the monitor. The application was set up by the Josh Nation according to the vendor's documentation describing the system set-up and preparation. The application itself was running on the system using a test database. Technically, the system performance (i.e., response time) was representative to what actual users would experience in a field implementation.

TEST FORMS AND TOOLS

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

- Informed Consent
- Moderator's Guide
- Post-test Questionnaire

Examples of these documents can be found in Appendices 3-6 respectively. The Moderator's Guide was devised so as to be able to capture required data. The participant's interaction with the EHRUT was captured and recorded digitally with screen capture software running on the test machine.

PARTICIPANT INSTRUCTIONS

The administrator reads the following instructions aloud to the each participant (also see the full moderator's guide in Appendix [B4]):

Thank you for participating in this study. Your input is very important. Our session today will last about

1 hour. During that time you will use an instance of an electronic health record. I will ask you to complete a few tasks using this system and answer some questions. You should complete the tasks as quickly as possible making as few errors as possible. Please try to complete the tasks on your own following the instructions very closely. Please note that we are not testing you 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.

Overall, we are interested in how easy (or how difficult) this system is to use, what in it would be useful to you, and 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. Should you feel it necessary you are able to withdraw at any time during the testing.

Following the procedural instructions, participants were shown the EHR and as their first task, were given time 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 the remaining additional tasks to complete. Tasks are listed in the moderator’s guide in Appendix 4.

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 [EHRUT] by measuring participant success rates and errors
2. Efficiency of [EHRUT] by measuring the average task time and path deviations
3. Satisfaction with [EHRUT] by measuring ease of use ratings

DATA SCORING

The following table (Table [x]) details how tasks were scored, errors evaluated, and the time data analyzed.

Measures

Effectiveness:

Task Success

Rationale and Scoring

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 optimal 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., 1.25] that allows some time buffer because the participants are presumably not trained to expert performance. Thus, if expert, optimal performance on a task was 10 seconds then allotted task time performance was $[10 * 1.25]$ seconds. This ratio should be aggregated across tasks and reported with mean and variance scores.

Effectiveness:

Task Failures

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 an "Failures." No task times were taken for errors. The total number of errors was calculated for each task and then divided by the total number of times that task was attempted. Not all deviations would be counted as errors. This should also be expressed as the mean number of failed tasks per participant. On a qualitative level, an enumeration of errors and error types should be collected.

Efficiency:

Task Deviations

The participant's path (i.e., steps) through the application was recorded. 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. It is strongly recommended that task deviations be reported. Optimal paths (i.e., procedural steps) should be recorded when constructing tasks.

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. Variance measures (standard deviation and standard error) were also calculated.

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. Common convention is that average ratings for systems judged easy to use should be 3.3 or above. To measure participants' confidence in and likeability of the [EHRUT] overall, the testing team administered 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," and "I would imagine that most people would learn to use this system very quickly." See full System Usability Score questionnaire in Appendix 5.

RESULTS

DATA ANALYSIS AND REPORTING

The results of the usability test were calculated according to the methods specified in the Usability Metrics section above. The usability testing results for the EHRUT are detailed below (see Table [x])14. The results should be seen in light of the objectives and goals outlined in Section 3.2 Study Design. The data should yield actionable results that, if corrected, yield material, positive impact on user performance.

Task	Successes out of 10	Deviations observed	Task Rating (Average)
1.ONC 170.315(a)(1) CPOE-Medications	10	User went to incorrect area	88.3
2.ONC 170.315(a)(2)– Computerized Provider Order Entry (CPOE) - Laboratory	8.6	User went to an incorrect area	81.3
3.ONC 170.315(a)(3)– Computerized Provider Order Entry (CPOE) – Diagnostic Imaging	8.3	User went into patient chart instead of exam	76.6
4.ONC 170.315(a)(4)– Drug-drug, Drug- allergy Interaction Checks	6.3	User went into patient chart instead of exam	70.0
5.ONC 170.315(a)(5)- Demographics	10	None	95.0
6.ONC 170.315(a)(6)- Problem List	10	None	96.5
7.ONC 170.315(a)(7)- Medication List	10	None	91.25
8.ONC 170.315(a)(8)- Medication Allergy List	10	Users were attempting this from inside patient chart instead of exam	91.25
9.ONC 170.315(a)(9)- Clinical Decision Support	7.8	Most users were confused by CDS, the process of triggering and how to view	80.0

10.ONC 170.315(a)(14)- Implantable Device List	9.3	One user started to go outside of the exam, but quickly correctly path	83.3
11.ONC 170.315(b)(2)- Clinical Information Reconciliation and Incorporation	7.5	One user started to go outside of the exam, but quickly correctly path	80.0
12.ONC 170.315(b)(3)-E- Prescribing	0.0	Not applicable	0.0

The results from the SUS (System Usability Scale) scored the subjective satisfaction with the system based on performance with these tasks to be mean average of 8.15. Broadly interpreted, scores under 6.5 represent systems with poor usability; scores over 8.5 would be considered above average.

DISCUSSION OF FINDINGS EFFECTIVENES

- Based on the results of the tests, the EHR appears to successfully serve the chiropractic market
- The data was displayed in a way that users found easy to understand
- Three of the users asked why the test was not being run on a tablet (Android/iPad); the system is Windows tablet compatible but not designed for the cloud or standard consumer tablets

EFFICIENCY

- Users completed over 100% of the tasks within the allotted time
- There were only 8 instances of users going into an incorrect area or window
- Users felt that some screens could be removed/combined

SATISFACTION

- Overall subjects were moderately satisfied with the usability of the system
- Users correlated their satisfaction to the interface, note, the interface was set on default blue color scheme and standard exam layout however they felt comfortable customizing to areas they preferred.

MAJOR FINDINGS

- Users found the clinical decision support confusing both as a topic and process.
- Several users encountered errors when attempting drug/drug drug/allergy checks

- One user felt the system would benefit from more templates and/or macros to aid in ease of data entry.

AREAS FOR IMPROVEMENT

- Simplify the medication reconciliation screen
- Send the product back to the quality assurance team to resolve all bugs before it goes live to public
- Discuss possibly adding new macros in future iterations
- A tablet friendly exam was recommended by all

APPENDICES

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

- 1- Recruiting screener
- 2- Participant demographics
- 3- Moderator's Guide
- 4- System Usability Scale Questionnaire

APPENDIX 1: RECRUITING SCREENER

Hello, my name is Josh Nation. We are recruiting individuals to participate in a usability study for an electronic health record. We would like to ask you a few questions to see if you qualify and if you would like to participate. This should only take a few minutes of your time. This is strictly for research purposes. If you are interested and qualify for the study, you will be paid to participate. Can I ask you a few questions?

1. [If not obvious] Please state gender?
2. Have you participated in a focus group or usability test in the past 12 months?
3. Do you, or does anyone in your home, work in marketing research, usability research, web design [...etc.]?
4. Do you, or does anyone in your home, have a commercial or research interest in an electronic health record software or consulting company?
(if 2, 3, or 4 are yes terminate the conversation)
5. Would you be willing to provide your age?
6. Do you require any assistive technologies to use a computer? [if so, please describe]

Professional Demographics

7. What is your current position and title?
8. How long have you held this position?
9. Describe your work location (or affiliation) and environment?
10. What is your highest level of education?

Computer Expertise

11. Besides reading email, what professional activities do you do on the computer?
12. About how many hours per week do you spend on the computer?
13. What computer platform do you usually use?
14. What Internet browser(s) do you usually use?
15. In the last month, how often have you used an electronic health record?
16. How many years have you used an electronic health record?
17. How many EHRs do you use or are you familiar with?

Contact Information

Those are all the questions I have for you. (if the background matches proceed)

May I get your contact information?

- Name of participant:

- Address:
- City, State, Zip:
- Daytime phone number:
- Evening phone number:
- Alternate [cell] phone number:
- Email address:

APPENDIX 2: PARTICIPANT DEMOGRAPHICS

The report should contain a breakdown of the key participant demographics. A representative list is shown below.

Gender

Men	5
Women	5

Occupation Role

Chiropractic Assistant	2
Office Assistant	1
Office Manager	2
Chiropractors	4
Office Biller	1

Product Experience

0–5 years	0
5-10 years	0
10+ years	2

APPENDIX 3: MODERATOR'S GUIDE

Steps prior to testing

Prior to testing

- Confirm schedule with Participants
- Ensure EHRUT lab environment is running properly
- Ensure lab and data recording equipment is running properly

Prior to each participant:

- Reset application

Prior to each task:

- Reset application to starting point for next task

Orientation (X minutes)

Thank you for participating in this study. Our session today will last 60 minutes. During that time you will take a look at an electronic health record system.

I will ask you to complete a few tasks using this system and answer some questions. We are interested in how easy (or how difficult) this system is to use, what in it would be useful to you, and how we could improve it. You will be asked to complete these tasks on your own trying to do them as quickly as possible with the fewest possible errors or deviations. If you get lost or have difficulty I cannot help you with anything to do with the system itself. Please save your detailed comments until the end of a task or the end of the session as a whole when we can discuss freely.

Please be honest with your opinions. The product you will be using today is FortéEMR 3.0, the newest version of the chiropractic EHR. Some of the data may not make sense as it is placeholder data. All of the information that you provide will be kept confidential and your name will not be associated with your comments at anytime.

- Do you have any questions or concerns?
- What is your job title?
- How long have you been working in this role?
- What are some of your main responsibilities in conjunction with medical records?

Task 1: First Impressions

This is the application you will be working with. Tell me what you know about it.

[Show test participant the EHRUT]

Please don't click on anything just yet. What do you notice? What are you able to do here? Please be specific.

Subject comments:

Administrator comments:

Task 2: ONC 170.315(a)(1) CPOE-Medications

Record, change and access patient's medication orders.

Success:

- Easily completed
- Completed with difficulty or help : Describe below
- Not completed

TaskTime: _____seconds

Optimal Path: [*From patient chart, exam screen, navigate to medications list to access, record, change medication orders for specific patient*]

- Correct
- Minor Deviations / Cycles :: Describe below
- Major Deviations :: Describe below

Subject comments:

Administrator comments:

Observed Errors and Verbalizations:

Rating:

Overall, this task was:

- Very difficult
- Difficult
- Average
- Easy
- Very Easy

Task 3: ONC 170.315(a)(2)–Computerized Provider Order Entry (CPOE) - Laboratory

Record, change and access patient’s laboratory orders.

Success:

- Easily completed
- Completed with difficulty or help :: Describe below
- Not completed

Task Time: ____ seconds

Optimal Path: *[From patient chart, exam screen, navigate to labs area to access, record, change laboratory orders for specific patient]*

- Correct
- Minor Deviations / Cycles :: Describe below
- Major Deviations :: Describe below

Subject comments:

Administrator comments:

Observed Errors and Verbalizations:

Rating:

Overall, this task was:

- Very difficult
- Difficult
- Average
- Easy
- Very Easy

Task 4: ONC 170.315(a)(3)–Computerized Provider Order Entry (CPOE) – Diagnostic Imaging

Record, change, and access a patient’s imaging orders

Success:

- Easily completed
- Completed with difficulty or help :: Describe below
- Not completed

TaskTime:____seconds

Optimal Path: [*From patient chart, exam screen, navigate to imaging area to access, record, change imaging information for specific patient*]

- Correct
- Minor Deviations / Cycles :: Describe below
- Major Deviations :: Describe below

Subject comments:

Administrator comments:

Observed Errors and Verbalizations:

Rating:

Overall, this task was:

- Very difficult
- Difficult
- Average
- Easy
- Very Easy

Task 5: ONC 170.315(a)(4)–Drug-drug, Drug-allergy Interaction Checks

Activate drug-drug and drug-allergy interventions automatically within a patient exam.

Success:

- Easily completed
- Completed with difficulty or help :: Describe below
- Not completed

Task Time: ____ seconds

Optimal Path: [*From patient chart, exam screen, navigate to medication area; input multiple medications to verify drug-drug/drug allergy check processes for specific patient*]

- Correct
- Minor Deviations / Cycles :: Describe below
- Major Deviations :: Describe below

Subject comments:

Administrator comments:

Observed Errors and Verbalizations:

Rating:

Overall, this task was:

- Very difficult
- Difficult
- Average
- Easy
- Very Easy

Task 6: ONC 170.315(a)(5)-Demographics

Record patient demographic information by accessing/editing information which should include, but is not limited to, race, ethnicity, preferred language, sex, sexual orientation, gender identity, data of birth.

Success:

- Easily completed
- Completed with difficulty or help :: Describe below
- Not completed

Task Time: _____seconds

Optimal Path: [*From patient chart, exam screen, navigate to patient demographic area to access, record, change patient demographics*]

- Correct
- Minor Deviations / Cycles :: Describe below
- Major Deviations :: Describe below

Subject comments:

Administrator comments:

Observed Errors and Verbalizations:

Rating:

Overall, this task was:

- Very difficult
- Difficult
- Average
- Easy
- Very Easy

Task 7: ONC 170.315(a)(6)-Problem List

Record, change, and access a patient's active problem list.

Success:

- Easily completed
- Completed with difficulty or help :: Describe below
- Not completed

Task Time: ____ seconds

Optimal Path: *[From patient chart, exam screen, navigate to problem list to access, record, change problems for a specific patient]*

- Correct
- Minor Deviations / Cycles :: Describe below
- Major Deviations :: Describe below

Subject comments:

Administrator comments:

Observed Errors and Verbalizations:**Rating:**

Overall, this task was:

- Very difficult
- Difficult
- Average
- Easy
- Very Easy

Task 8: ONC 170.315(a)(7)-Medication List

Record, change, and access a patient's medication list.

Success:

- Easily completed
- Completed with difficulty or help :: Describe below
- Not completed

TaskTime: ____seconds

Optimal Path: *[From patient chart, exam screen, navigate to medications list to access, record, change medications for specific patient]*

- Correct
- Minor Deviations / Cycles :: Describe below
- Major Deviations :: Describe below

Subject comments:

Administrator comments:

Observed Errors and Verbalizations:

Rating:

Overall, this task was:

- Very difficult
- Difficult
- Average
- Easy
- Very Easy

Task 9: ONC 170.315(a)(8)-Medication Allergy List

Record, change, and access a patient's medication allergies.

Success:

- Easily completed
- Completed with difficulty or help :: Describe below
- Not completed

Task Time: ____seconds

Optimal Path: [*From patient chart, exam screen, navigate to medications list to access, record, change medication allergies for specific patient*]

- Correct
- Minor Deviations / Cycles :: Describe below
- Major Deviations :: Describe below

Subject comments:

Administrator comments:

Observed Errors and Verbalizations:

Rating:

Overall, this task was:

- Very difficult
- Difficult
- Average
- Easy
- Very Easy

Task 10: ONC 170.315(a)(9)-Clinical Decision Support

Trigger a clinical decision support interaction while in a patient exam.

Success:

- Easily completed
- Completed with difficulty or help :: Describe below
- Not completed

TaskTime: ____seconds

Optimal Path: [*Setup a patient, demographics, vitals, and a basic exam then click 'other' and 'CDS' to view all triggered CDS interactions*]

- Correct
- Minor Deviations / Cycles :: Describe below
- Major Deviations :: Describe below

Subject comments:

Administrator comments:

Observed Errors and Verbalizations:

Rating:

Overall, this task was:

- Very difficult
- Difficult
- Average
- Easy
- Very Easy

Task 11: ONC 170.315(a)(14)-Implantable Device List

Record an implantable device. Verify access and edit capability.

Success:

- Easily completed
- Completed with difficulty or help :: Describe below
- Not completed

TaskTime: ____seconds

Optimal Path: [*From patient file, patient exam, navigate to device list view/modify*]

- Correct
- Minor Deviations / Cycles :: Describe below
- Major Deviations :: Describe below

Subject comments:

Administrator comments:

Observed Errors and Verbalizations:

Rating:

Overall, this task was:

- Very difficult
- Difficult
- Average
- Easy
- Very Easy

Task 12: ONC 170.315(b)(2)-Clinical Information Reconciliation and Incorporation

Incorporate, reconcile, export CCDA file

Success:

- Easily completed
- Completed with difficulty or help :: Describe below
- Not completed

TaskTime: ____seconds

Optimal Path: [*From main screen of application right click patient, choose edit patient, click export/import CCD per desired action*]

- Correct
- Minor Deviations / Cycles :: Describe below
- Major Deviations :: Describe below

Subject comments:

Administrator comments:

Observed Errors and Verbalizations:

Rating:

Overall, this task was:

- Very difficult
- Difficult
- Average
- Easy
- Very Easy

Task 13: ONC 170.315(b)(3)-E-Prescribing

E-prescribe a new medication, change, cancel, refill, receive, request new prescription

Success:

- Easily completed
- Completed with difficulty or help :: Describe below
- Not completed

TaskTime: ____seconds

Optimal Path: [*From main screen of application right click patient, choose edit patient, click export/import CCD per desired action*]

- Correct
- Minor Deviations / Cycles :: Describe below
- Major Deviations :: Describe below

Subject comments:

Administrator comments:

Observed Errors and Verbalizations:

Rating:

Overall, this task was:

- Very difficult
- Difficult
- Average
- Easy
- Very Easy

Final Questions (*X Minutes*)

What was your overall impression of this system?

What aspects of the system did you like most?

What aspects of the system did you like least?

Were there any features that you were surprised to see?

What features did you expect to encounter but did not see? That is, is there anything that is missing in this application?

Compare this system to other systems you have used.

Would you recommend this system to your colleagues?

APPENDIX 4: SYSTEM USABILITY SCALE

	Strongly Disagree				Strongly Agree
	1	2	3	4	5
1. I think that I would like to use this system frequently					
2. I found the system unnecessarily complex					
3. I thought the system was easy to use					
4. I think that I would need the support of a technical person to be able to use this system					
5. I found the various functions in this system were well integrated					
6. I thought there was too much inconsistency in this system					
7. I would imagine that most people would learn to use this system very quickly					
8. I found the system very cumbersome to use					
9. I felt very confident using the system					
10. I needed to learn a lot of things before I could get going with this system					