EHR Usability Test Report

SisoHis V2.0

Report based on NIST 7742 Customized Common Industry Format Template for Electronic Health Record Usability Testing

SisoHis Version 2.0

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1. Executive Summary

A usability test of SisoHis was conducted from 02/02/2018 to 05/03/2018 by software development quality team for several modules of Sisoft Healthcare Information Systems. The purpose of this test was to test and validate usability of the SisoHis and provide quantitative analysis of the system's usability. During the usability test, 20 healthcare providers and/or other healthcare personnel, such as Healthcare Data Entry Personnels, Nurses and Doctors, matching the target demographic criteria and representing a cross section of our typical user base, served as participants and used the SisoHis in simulated, but representative tasks.

The study collected performance data on a series of tasks related to safety-enhanced design, typically conducted on an EHR. The tasks are correlated to the certificate criteria in 45 CFR Part 170 Subpart C of the Health Information 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:

- 170.315(a)(1) Computerized Provider Order Entry – Medications
- 170.315(a)(2) Computerized Provider Order Entry – Laboratory
- 170.315(a)(3) Computerized Provider Order Entry – Diagnostic Imaging
- 170.315(a)(4) Drug-Drug, Drug-Allergy Interactions Checks
- 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) E-Prescribe

During the 30 minutes test, 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 5.4); they were instructed that they could withdraw at any time. All participants were current users of SisoHis, so they had prior experience with the SisoHis. The administrator introduced the test and instructed participants to complete a series of tasks (given one at a time) using the SisoHis. The participants were also told that they can follow test instructions mentioned in Section 3.4. During the testing, the administrator timed the test and, along with the data logger(s) recorded user performance data on paper and electronically. After each task, the participants were requested to enter the percentage of Task Success. The administrator did not give the participants assistance in how to complete the task.

Various recommended metrics, in accordance with the examples set forth in the NIST 7742 Customized Common Industry Format Template for Improving the Usability of Electronic Health Records, were used to evaluate the usability of the SisoHis. Following is a summary of the performance and rating data collected on the SisoHis:

- Number of tasks successfully completed within the allotted time without assistance
- Time to complete the tasks
- Number and types of errors
- Path deviations and their types
- Tasks success rate
- Participant's satisfaction ratings of the system

The results from the System Usability Scale scored the subjective satisfaction with the system based on performance with the usability tasks.

In addition to the performance data, the following qualitative observations were made:

- Test comments after the test
- Major findings
- Areas for improvement

1.1 Data Summary

The summary of the performance and rating data collected during the Electronic Health Record Usability Testing (EHRUT) on the Table 1.1.

	Measure						
	N	Task Success	Path Deviation	Task Time (Seconds)		Errors	Scenario Ratings (5=Easy)
Task	#	Percent (%)	Deviations (Observed / Optimal)	Mean (SD)	Deviations (Observed / Optimal)	Percent (%)	Mean (SD)
CPOE Medications							
Task A1.1: Select patient's record & access orders	10	90%	10/9	32 (2)	32/28	%10	3.3 (0.8)
Task A1.2: Select patient's record & enter order	10	100%	15/13	47 (3)	47/43	%0	3.20 (0.6)
Task A1.3: Select patient's record & change order	10	100%	13/11	43 (4)	43/38	%0	3.3 (0.8)
CPOE - Laboratory							

Task A2.1: Select patient's record & access orders	10	100%	11 / 9	33 (2)	33 / 28	%0	3.5 (0.7)
Task A2.2: Select patient's record & enter order	10	100%	15/12	46 (2)	46/43	%0	3.4 (0.5)
Task A2.3: Select patient's record & change order	10	100%	13/11	42 (2)	42/38	%0	3.5 (0.7)
CPOE - Radiology							
Task A3.1: Select patient's record & access orders	10	100%	11/9	31 (2)	31/28	0%	3.2 (0.4)
Task A3.2: Select patient's record & enter order	10	100%	15/12	45 (2)	45/43	0%	3.4 (0.5)
Task A3.3: Select patient's record & change order	10	100%	13/11	44 (4)	44/38	0%	3.4 (0.8)
Drug-Drug, Drug-Allergy Interaction Checks							
Task A4.1: Review and action upon Drug-Drug interaction alert	10	100%	18/17	55 (4)	55/48	0%	2.9 (0.5)
Task A4.2: Review and action upon Drug-Allergy interaction alert	10	100%	16/15	34 (4)	34/28	0%	3.0 (0.6)
Task A4.3: Update Setting, Interaction Severity Level	10	100%	14/13	62 (3)	62/57	0%	3.1 (0.5)
Task A4.4: Review and action upon Drug-Allergy interaction alert	10	100%	14/13	65 (2)	65/57	0%	2.8 (0.4)
Demographics							
Task A5.1: Record demographic data	10	100%	15/15	32 (2)	32/30	0%	3.6 (0.5)
Task A5.2: Change demographic data	10	100%	11/10	26 (2)	26/23	0%	3.3 (0.4)
Task A5.3: Access demographic data	10	100%	5/5	14 (2)	14/13	0%	3.5 (0.7)
Task A5.4: Record preliminary cause & death of date	10	100%	7/6	17 (2)	17/15	0%	3.4 (0.7)
Task A5.5: Change preliminary cause &	10	100%	9/8	19 (2)	19/18	0%	3.4 (0.8)

death of date							
Problem List							
Task A6.1: Select patient's record & enter problem (for outpatient)	10	100%	14/11	22 (2)	22/20	0%	3.1 (0.5)
Task A6.2: Select patient's record & access problem (for outpatient)	10	100%	9/6	18 (2)	18/15	0%	3.2 (0.6)
Task A6.3: Select patient's record & change problem (for outpatient)	10	100%	11/10	22 (3)	22/19	0%	3.4 (0.5)
Task A6.4: Select patient's record & enter problem (for inpatient)	10	100%	12/11	23 (1)	23/20	0%	3.3 (0.4)
Task A6.5: Select patient's record & access problem (for inpatient)	10	100%	7/6	18 (1)	18/15	0%	3.3 (0.4)
Task A6.6: Select patient's record & change problem (for inpatient)	10	100%	11/10	21 (1)	21/19	0%	3.4 (0.7)
Medication List							
Task A7.1: Select patient's record & enter medication (for outpatient)	10	100%	14/13	47 (2)	47/43	0%	3.0 (0.4)
Task A7.2: Select patient's record & access medication (for outpatient)	10	100%	10/9	30 (1)	30/28	0%	3.2 (0.4)
Task A7.3: Select patient's record & change medication (for outpatient)	10	100%	12/11	47 (5)	47/38	0%	3.1 (0.5)
Task A7.4: Select patient's record & enter medication (for inpatient)	10	100%	13/13	47 (3)	47/43	0%	3.0 (0)
Task A7.5: Select patient's record & access medication (for inpatient)	10	100%	9/9	36 (3)	36/28	0%	3.0 (0.4)
Task A7.6: Select patient's record &	10	100%	12/11	39 (1)	39/38	0%	3.1 (0.3)

change medication (for inpatient)							
Medication Allergy List							
Task A8.1: Select patient's record & enter allergy	10	100%	12/11	28 (2)	28/23	0%	3.0 (0.6)
Task A8.2: Select patient's record & access allergy	10	100%	7/6	17 (2)	17/13	0%	3.1 (0.5)
Task A8.3: Select patient's record & change allergy	10	100%	10/9	25 (3)	25/21	0%	3.0 (0.6)
Task A8.4: Select patient's record & enter allergy (for inpatient)	10	100%	12/11	26 (1)	26/23	0%	3.0 (0.6)
Task A8.5: Select patient's record & access allergy (for inpatient)	10	100%	7/6	18 (1)	18/13	0%	3.0 (0.4)
Task A8.6: Select patient's record & change allergy (for inpatient)	10	100%	10/9	26 (3)	26/21	0%	3.1 (0.3)
Clinical Decision Support							
Task A9.1: Access to clinical decision support setting (with authorized user)	10	100%	16/15	41 (3)	41/35	0%	2.8 (0.4)
Task A9.2: Access to clinical decision support setting (with unauthorized user)	10	100%	2/2	5 (0)	5/4	0%	3.4 (1)
Task A9.3: Create a rule set definition & interactions	10	80%	17/16	52 (15)	52/39	20%	2.4 (0.5)
Task A9.4: Patient demographic and medical records creation & CDS interaction follow - up	10	80%	13/12	33 (11)	33/30	20%	2.7 (0.4)
Implantable Device List							
Task A14.1: Record & Parse Unique Device Identifiers (UDI)	10	100%	12/11	29 (2)	29/23	0%	2.8 (0.4)
Task A14.2: Description of Implantable device	10	100%	10/9	25 (2)	25/20	0%	3.4 (0.5)

Task A14.3: Access & Display Implantable device list	10	100%	7/6	23 (6)	23/15	0%	3.2 (0.8)
Task A14.4: Change status of unique device identifier	10	100%	10/9	20 (1)	20/20	0%	2.8 (0.4)
Clinical Information Reconciliation and Incorporation							
Task B2.1: Patient record with a (C-CDA) summary care	10	100%	6/6	25 (3)	25/20	0%	3.6 (0.5)
Task B2.2: Verify one or more CDS interventions	10	100%	10/9	25 (5)	25/20	0%	3.4 (0.5)
Task B2.3: Export patient summary care (C-CDA)	10	100%	8/8	17 (1)	17/15	0%	3.6 (0.5)
e-Prescribe							
Task B3.1: Create new prescriptions	10	100%	15/14	46 (2)	46/42	0%	3.1 (0.5)
Task B3.2: Change prescriptions	10	100%	15/14	45 (2)	45/42	0%	3.1 (0.5)
Task B3.3: Cancel prescriptions	10	100%	15/14	45 (2)	45/42	0%	3.1 (0.7)
Task B3.4: Refill prescriptions (Status)	10	100%	11/10	43 (4)	43/35	0%	3.5 (0.5)
Task B3.5: Medication history (Request, Recieve)	10	100%	11/11	46 (3)	46/43	0%	3.0 (0.6)
Task B3.6: Limit a user's ability to prescribe	10	100%	18/18	58 (7)	58/50	0%	3.1 (0.5)

Tablo 1.1 : Test Results Summary

2. Introduction

The Usability test was conducted on SisoHis Version 2.0. SisoHis; is an ambulatory and inpatient health record system, consisting of procedures such as medical monitoring of patients at the clinical level; operation of all medical and administrative modules in one software; processing, reporting, financial monitoring of an health record and its submission to integrated software and devices in a safety ensured environment.

This Usability test, consists of the real scenarios typically used by SisoHis users. The purpose of this study was to test and validate the usability of the current user interface, and provide evidence of usability in the SisoHis. To this end, test data, time on task and deviations are measured and a metrics measuring Task Success Rate was used to capture effectiveness, efficiency and satisfaction.
Terms frequently used in this Usability test report are defined as follows:

- **Participant**: The user who had prior experience with the SisoHis. The users participating in the

test filled out Participation Document (Appendix 5.1) and completed Usability test.

- **Scenario:** A summary featuring information that provide clinical framework to the tasks handed out to the participants
- **Task**: A verbal and written clinical workflow, which has predefined goals at the end of all steps and provided to all participants during the Usability test.
- **Subtask**: A tasks section in which data are analyzed with a specific tool.
- **Test**: Compilation of tasks specific to the role of a participant in test session.
- **Path**: A series of actions in order to reach a goal in the SisoHis.

This study was conducted on SisoHis 2.0 for Ambulatory and Inpatient clinical modules.

3. Method

3.1 Method Participants

A total of 20 paritipants, namely 10 Doctors, 5 Data Entry Personnels and 5 Nurses, were tested on the SisoHis. They were asked to complete a total of 11 tasks and subtasks. Scenarios and subtasks were specified within in the tasks which are mentioned as titles in Tasks section. Participants were not paid monetary compensation for their participation in the Usability test.

SisoHis is designed for Phyisicans and nurses, therapist and other healthcare specialist to perform their duties with regard to primary healthcare and ambolatory services. The participants were the users of previous version of the SisoHis. They did not assume any role in product development processes of the SisoHis and were not employed by Sisoft Hospital Information Systems at any time in the past.

The participants filled out a Recruitment Screener (See Appendix 5.1) that is used to collect demographic information and evaluate their suitability to participate in the test. Participant names were replaced with Participant IDs so that an individual's data cannot be tied back to individual identities.

Among 15 doctors, 15 nurses and 15 healthcare data entry personnel, who were given Recruitment Screener to fill out; 10 doctor, 5 nurses and 5 healthcare data entry personnel were selected for the usability test.

Participants were scheduled for 1 session of 30 minutes. The demographic data of the participants is illustrated in Table 3.1.

Participant Identifier	Participant Gender	Participant Age	Education	Occupation /Role	Professional Experience	Computer Experience	Product Experience	Assistive Technology Needs
A1	Male	30-39	Doctorate degree (e.g., MD, DNP,	Physician	Internal Medicine	120	36	No

			DMD, PhD)					
A2	Male	30-39	Doctorate degree (e.g., MD, DNP, DMD, PhD)	Physician	Internal Medicine	120	48	No
A3	Female	30-39	Doctorate degree (e.g., MD, DNP, DMD, PhD)	Physician	Internal Medicine	120	24	No
A4	Male	40-49	Doctorate degree (e.g., MD, DNP, DMD, PhD)	Physician	General practitioner	180	60	No
A5	Male	30-39	Doctorate degree (e.g., MD, DNP, DMD, PhD)	Physician	General practitioner	120	60	No
A6	Female	20-29	Doctorate degree (e.g., MD, DNP, DMD, PhD)	Physician	General practitioner	80	48	No
A7	Female	20-29	Doctorate degree (e.g., MD, DNP, DMD, PhD)	Physician	General practitioner	100	36	No
A8	Male	40-49	Doctorate degree (e.g., MD, DNP, DMD, PhD)	Physician	Internal Medicine	150	60	No
A9	Male	30-39	Doctorate degree (e.g., MD, DNP, DMD, PhD)	Physician	General practitioner	120	24	No
A10	Male	30-39	Doctorate degree (e.g., MD, DNP, DMD, PhD)	Physician	General practitioner	120	24	No
B1	Male	30-39	Associate degree	Patient Services And Desk	Receptionist	100	36	No
B2	Male	20-29	Associate degree	Patient Services And Desk	Office Assistant	90	36	No
B3	Male	20-29	Bachelor's Degree	IT Manager	IT Director	120	20	No
B4	Female	20-29	Bachelor's Degree	IT Manager	IT Director	110	24	No
B5	Female	20-29	Associate degree	Patient Services And Desk	Office Assistant	100	18	No
C1	Female	20-29	Associate degree	Nurse	Nurse Practitioner	60	24	No
C2	Female	20-29	Associate degree	Nurse	Nurse Practitioner	70	28	No
C3	Female	20-29	Associate degree	Nurse	Nurse Practitioner	75	36	No
C4	Female	30-39	Associate degree	Nurse	Nurse Practitioner	120	48	No
C5	Female	30-39	Associate degree	Nurse	Nurse Practitioner	100	20	No

Tablo 3.1 : Participant Demographic Data

3.2 Study Design

Overall, the objective of this test was to uncover areas where the appliaction performed well -that is,

effectively, efficiently and with satisfaction- and areas where the application failed to meet the needs of te participants.

During the usability test, participants interacted with SisoHis. Each participant used the system in a conference room or training room of the institution they are employed. They were provided with the same instructions by the moderator. The system was evaluated for effectiveness, efficiency and satisfaction as defined by measures collected and analyzed for each pariticpant:

- Number of tasks successfully completed within the allotted time without assistance
- Time to complete the tasks
- Number and types of errors
- Task deviations
- Pariticipant'satisfaction ratings of the system
- System Usability Scale score
- For additional information usability scale, see Section 3.9.

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 SisoHis, including:

1. CPOE – Medication
2. CPOE – Laboratory
3. CPOE – Radiology
4. Drug-Drug and Drug-Allergy interaction checks
5. Patient Demographic Changes
6. Problem List
7. Medication List
8. Medication Allergy List
9. Clinical Decision Support (CDS)
10. Implantable Device List
11. Clinical Information Reconciliation and Incorporation
12. E-Prescribe

These tasks were selected based on the 2015 Edition Health IT Certification criteria, considering frequency of user interactions, potential risks of user errors and criticality of function.

3.4 Procedures

Upon arrival, participants were greeted. Their identity was verified and matched to the names on the participant Schedule. Participants were then assigned an alpha numerical ID. In order to differentiate the groups of participants; Doctor group's ID began with A initial, Data entry personnel group's was B and Nurse group's was C initial.

The moderator was a SisoHis Training Support Department personnel and had competence and knowledge to conduct Test and Scenarios. The participants worked in their employed institution and Sisoft Headquarters on computers provided by Sisoft in according with test instructions.

Tasks featured in Task Data Sheet (Appendix 5.2) are distributed to the groups according to their roles and work efficiency. For example, Doctor and Nurse group was assigned tasks mostly consist of medical procedures while Data Entry Personnel group was assigned tasks that feature technical customizations as well.

Participants were instructed to perform the tasks:

- At their own pace without assitance; Moderator was only allowed to give immaterial guidance and clarification on tasks but not instructions for use without reductions in ratings.
- Without using a think aloud technique

The administrators read the tasks aloud to the participants and then instructed them to initiate performing the tasks. The participiants had the written copies of the tasks as well as verbal instruction of the moderator. The task time was stopped once the participant indicated they had successfully completed the tasks.

Following the session, the partipants conveyed their thoughts on the system to the moderator separately. Based on the feedback of the participants, the moderator investigated the causes of deviations and failures of the participants.

3.5 Test Location

The test was conducted the healthcare institutions and Sisoft Headquarters. The test facility included a waiting area and a quiet testing room with a table, computer for the participant, and recording computer for the administrator. Only the participant and administrator were in the test room. All observers and the data logger worked from a separate room where they could see the participant's screen and face shot, and listen to the audio of the session. 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 participants used mouse and keyboard when interacting with the SisoftHis. Since SisoHis Hospital Information System operates in a web-based architecture, no installations was made on the test computers. The data entered by the previous participants in the system was removed before the initiation of the test for each participant.

The computer used in the Sisoft Headquaters was Windows 7 running Dell precision T3600. The participants used up-to-date version of Google Chrome web browser while performing the tasks.

3.7 Test Forms And Tools

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

- Screen Recording Device
- The Moderator's Guide
- Participant Pack

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 SisoftHis was captured and recorded digitally with screen capture software running on the test machine. These records were saved and used in subsequent analyses.

3.8 Participant Instruction

The moderator gave a general introductory briefing and then read the instructions aloud to each participant. For sample Participation Orientation command file, see Appendix 5.3 The participants were asked to complete a series of tasks which were presented to the participants in tasksheets and also were read out by the moderator.

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. The effectiveness of SisoHis by measuring participant success rates and errors
2. The efficiency of SisoHis by measuring the average task time and path deviations
3. The satisfaction with SisoHis by measuring ease of use ratings

3.10 Data Scoring

The following table (Table 3.10) details how tasks were scored, errors evaluated, and the time data analyzed.

Measures	Rationale and Scorring

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. Success was calculated separately for each task. If a task is completed with the assistance of the moderator, this will be counted as failure in the measurement report. 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. If the participants remains idle for a predefined time (30 seconds), the moderator pauses the test and counts this as failure in the measurement report.
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."
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.
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.
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. Participant was asked to fill out the questionnaire in Appendix 5.6.

Tablo 3.10 Data scoring details

4. Results

The results of the usability test were calculated according to the methods specified in the Usability Metrics section above. All participants were present in test session and no data was excluded from the analyses.
The usability testing results for the SisoHis are detailed below.

4.1 Criteria 170.315(a1)(1) CPOE - Medications

Task Mapping

The table maps the 'Computerized Provider Order Entry (CPOE) medications' to usability test tasks to aid verification that the report will contain all required test scenarios for this EHR capability submitted for testing. Bold font is used within the certification criteria and within the steps for successful task completion to aid verification that the usability test tasks address the details of the specified criteria.

Tablo: CPOE - medications test criteria and tasks

	'Computerized Provider OrderEntry (CPOE) - Medications' Test Criteria and expectations are stated below,, the Usability test must conform to the criteria that are not 'Optional':
	(i) Enable a user to **record**, **change**, and **access** medication orders. (ii) Optional. Include a "reason for order" field.
	To successfully complete the clinical task, participants were required to complete each of the following subtasks:
	Task A1.1: Select patient's record & **access** orders Task A1.2: Select patient's record & **enter** order Task A1.3: Select patient's record & **change** order

Task Participant and Instructions

Based on user characteristics, typical workflow, and tasks performed as part of their daily work, prescribers and nurses on attempted this task.

Prescriber and nurse data were combined based on the fact that neither the task nor the user characteristics differ based on these user roles

Participant Task Instructions: The instructions are provided with **Appendix 5.2** – Task Data sheet with Task numbers.

Data Analysis and Reporting

Tablo: Test results for each subtask in CPOE - Medications task

	Measure					
	N	Task Success	Path Deviation	Task Time (Seconds)	Errors	Scenario Ratings (5=Easy)

Task	#	Percent (%)	Deviations (Observed / Optimal)	Mean (SD)	Deviations (Observed / Optimal)	Percent (%)	Mean (SD)
Task A1.1: Select patient's record & access orders	10	90%	10/9	32 (2)	32/28	%10	3.3 (0.8)
Task A1.2: Select patient's record & enter order	10	100%	15/13	47 (3)	47/43	%0	3.20 (0.6)
Task A1.3: Select patient's record & change order	10	100%	13/11	43 (4)	43/38	%0	3.3 (0.8)

Discussion of the Findings

The following sections discuss the results organized around an error analysis, test performance and error rates. The error analysis includes identification of use errors and user interface design issues as well as classification of severity based on the consequence of the error.

Error Analysis

No critical use errors were identified or observed as part of CPOE-Medications task.

Effectiveness

All participants, as suggested by timings by expert users, were able to perform the tasks within opital number of steps and time. One participant completed first step with the assistance of moderator, but completed second and third steps without any assistance.

Efficiency

No additional opportunity is observed for improving efficiency.

Satisfaction

Average success score of the participants was 3.3~ on average based on 5 point Likert-type scale. Most of the participants completed tasks successfully without difficulty.

Major Findings

Performance of three sub-groups are above 90% rate.

Areas for Improvement

No additional areas for improvement related to effectiveness and efficiency determined.

4.2 Criteria 170.315(a)(2) CPOE – Laboratory

Task Mapping

The table maps the '*Computerized Provider Order Entry (CPOE) laboratory*' criteria to usability test tasks to aid verification that the report will contain all required test scenarios for this EHR capability submitted for testing.

Table : CPOE - laboratory test criteria and tasks

	'Computerized Provider OrderEntry (CPOE) - Laboratory Test Criteria and expectations are stated below,, the Usability test must conform to the criteria that are not 'Optional':
	(i) Enable a user to **record**, **change**, and **access** laboratory orders. (ii) Optional. Include a "reason for order" field.
	To successfully complete the clinical task, participants were required to complete each of the following subtasks:
	Görev A1.1: Select patient's record & **access** orders Görev A1.2: Select patient's record & **enter** order Görev A1.3: Select patient's record & **change** order

Task Participant and Instructions

The instructions are provided with **Appendix 5.2** – Task Data sheet with Task numbers.

Data Analysis and Reporting

Table: Test results for each subtask in CPOE - Laboratory task

	Measure						
	N	Task Success	Path Deviation	Task Time (Seconds)		Errors	Scenario Ratings (5=Easy)
Task	#	Percent (%)	Deviations (Observed / Optimal)	Mean (SD)	Deviations (Observed / Optimal)	Percent (%)	Mean (SD)
Task A2.1: Select patient's record & access orders	10	100%	11 / 9	33 (2)	33 / 28	%0	3.5 (0.7)
Task A2.2: Select patient's record & enter order	10	100%	15/12	46 (2)	46/43	%0	3.4 (0.5)
Task A2.3: Select patient's record & change order	10	100%	13/11	42 (2)	42/38	%0	3.5 (0.7)

Error Analysis

No critical use errors were identified or observed as part of CPOE-Laboratory task.

Effectiveness

All participants, as suggested by timings by expert users, were able to perform the tasks within opital number of steps and time.

Efficiency

No additional opportunity is observed for improving efficiency.

Satisfaction

verage success score of the participants was 3.5˜ on average based on 5 point Likert-type scale

Major Findings

Performance of three sub-groups are 100% rate.

Areas for Improvement

No additional areas for improvement related to effectiveness and efficiency determined.

4.3 Criteria 170.315(a)(3) CPOE – Radiology

Görev Haritalaması (Task Mapping)

The table maps the '*Computerized Provider Order Entry (CPOE) – Radiology'* criteria to usability test tasks to aid verification that the report will contain all required test scenarios for this EHR capability submitted for testing.

Table: CPOE - Radiology test criteria and tasks

	'Computerized Provider OrderEntry (CPOE) - Medications' Test Criteria and expectations are stated below,, the Usability test must conform to the criteria that are not 'Optional':
	(i) Enable a user to **record**, **change**, and **access** radiology orders. (ii) Optional. Include a "reason for order" field.
	To successfully complete the clinical task, participants were required to complete each of the following subtasks:
	Görev A3.1: Select patient's record & **access** orders Görev A3.2: Select patient's record & **enter** order Görev A3.3: Select patient's record & **change** order

Task Participant and Instructions

Participant Task Instructions: The instructions are provided with **Appendix 5.2** – Task Data sheet with Task numbers.

Data Analysis and Reporting

Table: Test results for each subtask in CPOE - Radiology task

	Measure						
	N	Task Success	Path Deviation	Task Time (Seconds)		Errors	Scenario Ratings (5=Easy)
Task	#	Percent (%)	Deviations (Observed / Optimal)	Mean (SD)	Deviations (Observed / Optimal)	Percent (%)	Mean (SD)
Task A3.1: Select patient's record & access orders	10	100%	11/9	31 (2)	31/28	0%	3.2 (0.4)

Task A3.2: Select patient's record & enter order	10	100%	15/12	45 (2)	45/43	0%	3.4 (0.5)
Task A3.3: Select patient's record & change order	10	100%	13/11	44 (4)	44/38	0%	3.4 (0.8)

Error Analysis

No critical use errors were identified or observed as part of CPOE-Medications task.

Effectiveness

All participants, as suggested by timings by expert users, were able to perform the tasks within opital number of steps and time.

Efficiency

No additional opportunity is observed for improving efficiency.

Satisfaction

Average success score of the participants was 3.3˜ on average based on 5 point Likert-type scale.

Major Findings

Performance of three sub-groups are 100% rate.

Areas for Improvement

No additional areas for improvement related to effectiveness and efficiency determined.

4.4 Criteria 170.315(a)(4) Drug-Drug, Drug-Allergy Interaction Checks

Task Mapping

The table maps the *'Drug-Drug, Drug-Allergy Interaction Checks'* criteria to usability test tasks to aid verification that the report will contain all required test scenarios for this EHR capability submitted for testing.

Table : 'Drug-Drug, Drug-Allergy Interaction Checks' usabilty test criteria and tasks

	'Drug-Drug, Drug-Allergy Interaction Checks' Test criteria and expectations are stated below.
	(i) *Interventions.* Before a medication order is completed and acted upon during computerized provider order entry (CPOE), interventions must automatically indicate to a user drug-drug and drug-allergy contraindications based on a patient's medication list and medication allergy list.

	(ii) *Adjustments.* *(A)* Enable the severity level of interventions provided for drug-drug interaction checks to be adjusted. (B) Limit the ability to adjust severity levels in at least one of these two ways: (1) To a specific set of identified users. (2) As a system administrative function.
	To successfully complete the clinical task, participants were required to complete each of the following subtasks:
	Task A4.1: Review and action upon Drug-Drug interaction alert Task A4.2: Review and action upon Drug-Allergy interaction alert Task A4.3: Update Setting, Interaction Severity Level Task A4.4: Update Setting, Interaction Alert

Task Participant and Instructions

The instructions are provided with **Appendix 5.2** – Task Data sheet with Task numbers.

Data Analysis and Reporting

Table : Drug-Drug, Drug-Allergy Interactions Checks test criteria and tasks

	Measure						
	N	Task Success	Path Deviation	Task Time (Seconds)		Errors	Scenario Ratings (5=Easy)
Task	#	Percent (%)	Deviations (Observed / Optimal)	Mean (SD)	Deviations (Observed / Optimal)	Percent (%)	Mean (SD)
Task A4.1: Review and action upon Drug-Drug interaction alert	10	100%	18/17	55 (4)	55/48	0%	2.9 (0.5)
Task A4.2: Review and action upon Drug-Allergy interaction alert	10	100%	16/15	34 (4)	34/28	0%	3.0 (0.6)
Task A4.3: Update Setting, Interaction Severity Level	10	100%	14/13	62 (3)	62/57	0%	3.1 (0.5)
Task A4.4: Review and action upon Drug-Allergy interaction alert	10	100%	14/13	65 (2)	65/57	0%	2.8 (0.4)

Error Analysis

No critical use errors were identified or observed as part *'Drug-Drug, Drug-Allergy Interaction Checks'* task.

Effectiveness

All participants, as suggested by timings by expert users, were able to perform the tasks within opital number of steps and time.

Efficiency

No additional opportunity is observed for improving efficiency.

Satisfaction

Average success score of the participants was 3.0 on average based on 5 point Likert-type scale.

Major Findings

Performance of four sub-groups are 100% rate.

Areas for Improvement

No additional areas for improvement related to effectiveness and efficiency determined.

4.5 Criteria 170.315(a)(5) Demographics

Task Mapping

The table maps the '*Demographics'* to usability test tasks to aid verification that the report will contain all required test scenarios for this EHR capability submitted for testing. Oluşturulan Rapor, test için gönderilen EHR yeterliğinin gerekli tüm test senaryolarını içermektedir.

Table : Demographics usability test criteria and tasks

	'Demographics' test criteria and expectations are stated below.
	(i) 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. *(A) Race and ethnicity.* (1) Enable each one of a patient's races to be recorded in accordance with, at a minimum, the standard specified in § 170.207(f)(2) and whether a patient declines to specify race. (2) Enable each one of a patient's ethnicities to be recorded in accordance with, at a minimum, the standard specified in § 170.207(f)(2) and whether a patient declines to specify ethnicity. (3) Aggregate each one of the patient's races and ethnicities recorded in accordance with paragraphs (a)(5)(i)(A)(*1*) and (*2*) of this section to the categories in the standard specified in § 170.207(f)(1). *(B) Preferred language.* Enable preferred language to be recorded in accordance with the standard specified in § 170.207(g)(2) and whether a patient declines to specify a preferred language. (C) *Sex.* Enable sex to be recorded in accordance with the standard specified in § 170.207(n)(1). (D) *Sexual orientation.* Enable sexual orientation to be recorded in accordance with the standard specified in § 170.207(o)(1) and whether a patient declines to specify sexual orientation.

	(E) *Gender identity.* Enable gender identity to be recorded in accordance with the standard specified in § 170.207(o)(2) and whether a patient declines to specify gender identity. (ii) *İnpatient setting only.* Enable a user to record, change, and access the preliminary cause of death and date of death in the event of mortality.
	To successfully complete the clinical task, participants were required to complete each of the following subtasks:
	Task A5.1: **Record** demographic data Task A5.2: **Change** demographic data Task A5.3: **Access** demographic data Task A5.4: **Record** preliminary cause & death of date Task A5.5: **Change** preliminary cause & death of date

Task Participant and Instructions

The instructions are provided with **Appendix 5.2** – Task Data sheet with Task numbers.

Data Analysis and Reporting

Table: Test results for each subtask in Demographics task

	Measure						
	N	Task Success	Path Deviation	Task Time (Seconds)		Errors	Scenario Ratings (5=Easy)
Task	#	Percent (%)	Deviations (Observed / Optimal)	Mean (SD)	Deviations (Observed / Optimal)	Percent (%)	Mean (SD)
Task A5.1: Record demographic data	10	100%	15/15	32 (2)	32/30	0%	3.6 (0.5)
Task A5.2: Change demographic data	10	100%	11/10	26 (2)	26/23	0%	3.3 (0.4)
Task A5.3: Access demographic data	10	100%	5/5	14 (2)	14/13	0%	3.5 (0.7)
Task A5.4: Record preliminary cause & death of date	10	100%	7/6	17 (2)	17/15	0%	3.4 (0.7)
Task A5.5: Change preliminary cause & death of date	10	100%	9/8	19 (2)	19/18	0%	3.4 (0.8)

Error Analysis

No critical use errors were identified or observed as part of *'Demographics'* task.

Effectiveness

All participants, as suggested by timings by expert users, were able to perform the tasks within opital number of steps and time.

Efficiency

No additional opportunity is observed for improving efficiency.

Satisfaction

Average success score of the participants was 3.4˜ on average based on 5 point Likert-type scale.

Major Findings

Performance of five sub-groups are 100% rate.

Areas for Improvement

No additional areas for improvement related to effectiveness and efficiency determined.

4.6 Criteria 170.315(a)(6) Problem List

Task Mapping

The table maps the '*Problem List*' criteria to usability test tasks to aid verification that the report will contain all required test scenarios for this EHR capability submitted for testing.

Table : Problem List usability test criteria and tasks

	'Problem List' test criteria and expectations are stated below.
	Enable a user to **record**, **change**, and **access** a patient's active problem list: *(i) Ambulatory setting only.* Over multiple encounters in accordance with, at a minimum, the version of the standard specified in §170.207(a)(4). *(ii) Inpatient setting only.* For the duration of an entire hospitalization in accordance with, at a minimum, the version of the standard specified in §170.207(a)(4).
	To successfully complete the clinical task, participants were required to complete each of the following subtasks:
	Task A6.1: Select patient's record & enter problem (for outpatient) Task A6.2: Select patient's record & access problem (for outpatient) Task A6.3: Select patient's record & change problem (for outpatient) Task A6.4: Select patient's record & enter problem (for inpatient) Task A6.5: Select patient's record & access problem (for inpatient) Task A6.6: Select patient's record & change problem (for inpatient)

Task Participant and Instructions

The instructions are provided with **Appendix 5.2** – Task Data sheet with Task numbers.

Data Analysis and Reporting

Table: Test results for each subtask in Problem List

	Measure						
	N	Task Success	Path Deviation	Task Time (Seconds)		Errors	Scenario Ratings (5=Easy)
Task	#	Percent (%)	Deviations (Observed / Optimal)	Mean (SD)	Deviations (Observed / Optimal)	Percent (%)	Mean (SD)
Task A6.1: Select patient's record & enter problem (for outpatient)	10	100%	14/11	22 (2)	22/20	0%	3.1 (0.5)
Task A6.2: Select patient's record & access problem (for outpatient)	10	100%	9/6	18 (2)	18/15	0%	3.2 (0.6)
Task A6.3: Select patient's record & change problem (for outpatient)	10	100%	11/10	22 (3)	22/19	0%	3.4 (0.5)
Task A6.4: Select patient's record & enter problem (for inpatient)	10	100%	12/11	23 (1)	23/20	0%	3.3 (0.4)
Task A6.5: Select patient's record & access problem (for inpatient)	10	100%	7/6	18 (1)	18/15	0%	3.3 (0.4)
Task A6.6: Select patient's record & change problem (for inpatient)	10	100%	11/10	21 (1)	21/19	0%	3.4 (0.7)

Error Analysis

No critical use errors were identified or observed as part of *'Problem List'* task.

Effectiveness

All participants, as suggested by timings by expert users, were able to perform the tasks within opital number of steps and time. One participant completed first step with the assistance of moderator, but completed second and third steps without any assistance.

Efficiency

No additional opportunity is observed for improving efficiency.

Satisfaction

Average success score of the participants was 3.2˜ on average based on 5 point Likert-type scale.

Major Findings

Performance of six sub-groups are 100% rate.

Areas for Improvement

No additional areas for improvement related to effectiveness and efficiency determined.

4.7 Criteria 170.315(a)(7) Medication List

Task Mapping

The table maps the '*Medication List*' criteria to usability test tasks to aid verification that the report will contain all required test scenarios for this EHR capability submitted for testing.

Table : 'Medication List' usability test criteria and tasks

	'Computerized Provider OrderEntry (CPOE) - Medications' test criteria and expectations are stated below, the Usability test must conform to the criteria that are not 'Optional':
	Enable a user to **record**, **change**, and **access** a patient's active medication list as well as medication history: *(i) Ambulatory setting only.* Over multiple encounters. *(ii) Inpatient setting only.* For the duration of an entire hospitalization.
	To successfully complete the clinical task, participants were required to complete each of the following subtasks:
	Task A7.1: Select patient's record & enter medication Task A7.2: Select patient's record & access medication Task A7.3: Select patient's record & change medication Task A7.4: Select patient's record & enter medication (for inpatient) Task A7.5: Select patient's record & access medication (for inpatient) Task A7.6: Select patient's record & change medication (for inpatient)

Task Participant and Instructions

The instructions are provided with **Appendix 5.2** – Task Data sheet with Task numbers.

Data Analysis and Reporting

Table : Test results for each subtask in Medication List task

	Measure

	N	Task Success	Path Deviation	Task Time (Seconds)		Errors	Scenario Ratings (5=Easy)
Task	#	Percent (%)	Deviations (Observed / Optimal)	Mean (SD)	Deviations (Observed / Optimal)	Percent (%)	Mean (SD)
Task A7.1: Select patient's record & enter medication (for outpatient)	10	100%	14/13	47 (2)	47/43	0%	3.0 (0.4)
Task A7.2: Select patient's record & access medication (for outpatient)	10	100%	10/9	30 (1)	30/28	0%	3.2 (0.4)
Task A7.3: Select patient's record & change medication (for outpatient)	10	100%	12/11	47 (5)	47/38	0%	3.1 (0.5)
Task A7.4: Select patient's record & enter medication (for inpatient)	10	100%	13/13	47 (3)	47/43	0%	3.0 (0)
Task A7.5: Select patient's record & access medication (for inpatient)	10	100%	9/9	36 (3)	36/28	0%	3.0 (0.4)
Task A7.6: Select patient's record & change medication (for inpatient)	10	100%	12/11	39 (1)	39/38	0%	3.1 (0.3)

Error Analysis

No critical use errors were identified or observed as part of *'Medication List'* task.

Effectiveness

All participants, as suggested by timings by expert users, were able to perform the tasks within opital number of steps and time.

Efficiency

No additional opportunity is observed for improving efficiency.

Satisfaction

Average success score of the participants was $3\tilde{}$ on average based on 5 point Likert-type scale.

Major Findings

Performance of six sub-groups are 100% rate.

Areas for Improvement

No additional areas for improvement related to effectiveness and efficiency determined.

4.8 Criteria 170.315(a)(8) Medication Allergy List

Task Mapping

The table maps the '*Medication Allergy List'* criteria to usability test tasks to aid verification that the report will contain all required test scenarios for this EHR capability submitted for testing.

Table : Medication Allergy List usability test criteria and tasks

	'Medication Allergy List' test criteria and expectations are stated below.
	Enable a user to record, change, and access a patient's active medication allergy list as well as medication allergy history: *(i) Ambulatory setting only.* Over multiple encounters. *(ii) Inpatient setting only.* For the duration of an entire hospitalization.
	To successfully complete the clinical task, participants were required to complete each of the following subtasks:
	Task A8.1: Select patient's record & enter allergy Task A8.2: Select patient's record & access allergy Task A8.3: Select patient's record & change allergy Task A8.4: Select patient's record & enter allergy (for inpatient) Task A8.5: Select patient's record & access allergy (for inpatient) Task A8.6: Select patient's record & change allergy (for inpatient)

Task Participant and Instructions

The instructions are provided with **Appendix 5.2** – Task Data sheet with Task numbers.

Data Analysis and Reporting

Table : Test results for each subtask in Medication Allergy List task

.

	Measure						
	N	Task Success	Path Deviation	Task Time (Seconds)		Errors	Scenario Ratings (5=Easy)
Task	#	Percent (%)	Deviations (Observed / Optimal)	Mean (SD)	Deviations (Observed / Optimal)	Percent (%)	Mean (SD)

Task A8.1: Select patient's record & enter allergy	10	100%	12/11	28 (2)	28/23	0%	3.0 (0.6)
Task A8.2: Select patient's record & access allergy	10	100%	7/6	17 (2)	17/13	0%	3.1 (0.5)
Task A8.3: Select patient's record & change allergy	10	100%	10/9	25 (3)	25/21	0%	3.0 (0.6)
Task A8.4: Select patient's record & enter allergy (for inpatient)	10	100%	12/11	26 (1)	26/23	0%	3.0 (0.6)
Task A8.5: Select patient's record & access allergy (for inpatient)	10	100%	7/6	18 (1)	18/13	0%	3.0 (0.4)
Task A8.6: Select patient's record & change allergy (for inpatient)	10	100%	10/9	26 (3)	26/21	0%	3.1 (0.3)

Error Analysis

No critical use errors were identified or observed as part of *'Medication Allergy List'* task.

Effectiveness

All participants, as suggested by timings by expert users, were able to perform the tasks within opital number of steps and time.

Efficiency

No additional opportunity is observed for improving efficiency.

Satisfaction

Average success score of the participants was 3 on average based on 5 point Likert-type scale.

Major Findings

Performance of six sub-groups are 100 rate.

Areas for Improvement

No additional areas for improvement related to effectiveness and efficiency determined.

4.9 Criteria 170.315(a)(9) Clinical Decision Support

Task Mapping

The table maps the '*Computerized Provider Order Entry (CPOE) medications'* criteria to usability test tasks to aid verification that the report will contain all required test scenarios for this EHR capability submitted for testing.

Table : 'Computerized Provider Order Entry (CPOE) medications' usability test criteria and tasks

	'Clinical Decision Support' test criteria and expectations are stated below.
	(i) *CDS intervention interaction.* Interventions provided to a user must occur when a user is interacting with technology. (ii) *CDS configuration.* *(A)* Enable interventions and reference resources specified in paragraphs (a)(9)(iii) and (iv) of this section to be configured by a limited set of identified users (e.g., system administrator) based on a user's role. (B) Enable interventions: (1) Based on the following data: (i) Problem list; (ii) Medication list; (iii) Medication allergy list; (iv) At least one demographic specified in paragraph (a)(5)(i) of this section; (v) Laboratory tests; and (vi) Vital signs. (2) When a patient's medications, medication allergies, and problems are incorporated from a transition of care/referral summary received and pursuant to paragraph (b)(2)(iii)(D) of this section. (iii) When a patient's medications, medication allergies, and problems are incorporated from a transition of care/referral summary received and pursuant to paragraph (b)(2)(iii)(D) of this section. (iv) *Linked referential CDS.* (A) Identify for a user diagnostic and therapeutic reference information in accordance at least one of the following standards and implementation specifications: (1) The standard and implementation specifications specified in §170.204(b)(3). (2) The standard and implementation specifications specified in §170.204(b)(4) (B) For paragraph (a)(9)(iv)(A) of this section, technology must be able to identify for a user diagnostic or therapeutic reference information based on each one and at least one combination of the data referenced in paragraphs (a)(9)(ii)(B)(*1*)(*i*), (*ii*), and (*iv*) of this section. (v) *Source attributes.* Enable a user to review the attributes as indicated for all CDS resources: (A) For evidence-based decision support interventions under paragraph (a)(9)(iii) of this section: (1) Bibliographic citation of the intervention (clinical research/guideline); (2) Developer of the intervention (translation from clinical research/guideline); (3) Funding source of the intervention development technical implementation; and (4) Release and, if applicable, revision date(s) of the intervention or reference source. (B) For linked referential CDS in paragraph (a)(9)(iv) of this section and drug-drug, drug-allergy interaction checks in paragraph (a) (4) of this section, the developer of the intervention, and where clinically indicated, the bibliographic citation of the intervention (clinical research/guideline).
	To successfully complete the clinical task, participants were required to complete each of the following subtasks:

	Task A9.1: Access to clinical decision support setting (with authorized user) Task A9.2: Access to clinical decision support setting (with unauthorized user) Task A9.3: Create a rule set definition & interactions Task A9.4: Patient demographic and medical records creation & CDS interaction follow - up

Task Participant and Instructions

Based on user characteristics, typical workflow, and tasks performed as part of their daily work, providers and clinical assistive personnels attempted this task.

The instructions are provided with **Appendix 5.2** – Task Data sheet with Task numbers.

Data Analysis and Reporting

Tablo : Test results for each subtask in Medication Allergy List task

	Measure						
	N	Task Success	Path Deviation	Task Time (Seconds)		Errors	Scenario Ratings (5=Easy)
Task	#	Percent (%)	Deviations (Observed / Optimal)	Mean (SD)	Deviations (Observed / Optimal)	Percent (%)	Mean (SD)
Task A9.1: Access to clinical decision support setting (with authorized user)	10	100%	16/15	41 (3)	41/35	0%	2.8 (0.4)
Task A9.2: Access to clinical decision support setting (with unauthorized user)	10	100%	2/2	5 (0)	5/4	0%	3.4 (1)
Task A9.3: Create a rule set definition & interactions	10	80%	17/16	52 (15)	52/39	20%	2.4 (0.5)
Task A9.4: Patient demographic and medical records creation & CDS interaction follow - up	10	80%	13/12	33 (11)	33/30	20%	2.7 (0.4)

Error Analysis

No critical use errors were identified or observed as part of *'Clinical Decision Support* ' task.

Effectiveness

All participants, as suggested by timings by expert users, were able to perform the tasks within opital number of steps and time.

Efficiency

No additional opportunity is observed for improving efficiency.

Satisfaction

Average success score of the participants was 3 on average based on 5 point Likert-type scale.

Major Findings

Performance of four sub-groups are above 80% rate.

Areas for Improvement

No additional areas for improvement related to effectiveness and efficiency determined.

4.10 Criteria 170.315(a)(14) Implantable Device List

Task Mapping

The table maps the *''Implantable Device List'* criteria to usability test tasks to aid verification that the report will contain all required test scenarios for this EHR capability submitted for testing.

Table : 'Implantable Device List' usability test criteria and tasks

	'Implantable Device List' test criteria and expectations are stated below.
	(i) Record unique device identifiers associated with a patient's Implantable Devices. (ii) Parse the following identifiers from a Unique Device Identifier: (A) Device Identifier; and (B) The following identifiers that compose the Production Identifier: (1) The lot or batch within which a device was manufactured; (2) The serial number of a specific device; (3) The expiration date of a specific device; (4) The date a specific device was manufactured; and (5) For an HCT/P regulated as a device, the distinct identification code required by 21 CFR 1271.290(c). (iii) Obtain and associate with each Unique Device Identifier: (A) A description of the implantable device referenced by at least one of the following: (1) The "GMDN PT Name" attribute associated with the Device Identifier in the Global Unique Device Identification Database. (2) The "SNOMED CT® Description" mapped to the attribute referenced in in paragraph (14)(iii)(A)(*1*) of this section. (B) The following Global Unique Device Identification Database attributes: (1) "Brand Name"; (2) "Version or Model"; (3) "Company Name"; (4) "What MRI safety information does the labeling contain?"; and (5) "Device required to be labeled as containing natural rubber latex or dry natural rubber (21 CFR 801.437)." (iv) Display to a user an implantable device list consisting of: (A) The active Unique Device Identifiers recorded for the patient; (B) For each active Unique Device Identifier recorded for a patient, the description of the implantable device specified by paragraph (a)(14)(iii)(A) of this section; and (C) A method to access all Unique Device Identifiers recorded for a patient.

	(v) A method to access all Unique Device Identifiers recorded for a patient. (A) The Unique Device Identifier; (B) The description of the implantable device specified by paragraph (a)(14)(iii)(A) of this section; (C) The identifiers associated with the Unique Device Identifier, as specified by paragraph (a)(14)(ii) of this section; and (D) The attributes associated with the Unique Device Identifier, as specified by paragraph (a)(14)(iii)(B) of this section. (vi) Enable a user to change the status of a Unique Device Identifier recorded for a patient.
	To successfully complete the clinical task, participants were required to complete each of the following subtasks:
	Task A14.1: Record & Parse Unique Device Identifiers (UDI) Task A14.2: Description of Implantable device Task A14.3: Access & Display Implantable device list Task A14.4: Change status of unique device identifier

Task Participant and Instructions

The instructions are provided with **Appendix 5.2** – Task Data sheet with Task numbers.

Data Analysis and Reporting

Table : Test results for each subtask in Implantable Device List task

	Measure						
	N	Task Success	Path Deviation	Task Time (Seconds)		Errors	Scenario Ratings (5=Easy)
Task	#	Percent (%)	Deviations (Observed / Optimal)	Mean (SD)	Deviations (Observed / Optimal)	Percent (%)	Mean (SD)
Task A14.1: Record & Parse Unique Device Identifiers (UDI)	10	100%	12/11	29 (2)	29/23	0%	2.8 (0.4)
Task A14.2: Description of Implantable device	10	100%	10/9	25 (2)	25/20	0%	3.4 (0.5)
Task A14.3: Access & Display Implantable device list	10	100%	7/6	23 (6)	23/15	0%	3.2 (0.8)
Task A14.4: Change	10	100%	10/9	20	20/20	0%	2.8

status of unique device identifier				(1)			(0.4)

Error Analysis

No critical use errors were identified or observed as part of *'Implantable Device List'* task.

Effectiveness

All participants, as suggested by timings by expert users, were able to perform the tasks within opital number of steps and time. One participant initially could not understand at the stage of recording tested device codes. One user was affected by the fact that added device code automatically to technical data.

Efficiency

No additional opportunity is observed for improving efficiency.

Satisfaction

Average success score of the participants was 3 on average based on 5 point Likert-type scale.

Major Findings

Performance of four sub-groups are 100% rate

Areas for Improvement

No additional areas for improvement related to effectiveness and efficiency determined.

4.11 Criteria 170.315(b)(2) Clinical Information Reconciliation and Incorporation

Task Mapping

The table maps the '*Computerized Provider Order Entry (CPOE) medications'* criteria to usability test tasks to aid verification that the report will contain all required test scenarios for this EHR capability submitted for testing.

Table : 'Computerized Provider Order Entry (CPOE) medications' usability test criteria and tasks

	'Clinical Information Reconciliation and Incorporation' test criteria and expectations are stated below.
	(i) *General requirements.* Paragraphs (b)(2)(ii) and (iii) of this section must be completed based on the receipt of a transition of care/referral summary formatted in accordance with the standards adopted in §170.205(a)(3) and §170.205(a)(4) using the Continuity of Care Document, Referral Note, and (inpatient setting only) Discharge Summary document templates.

	(ii) *Correct patient.* Upon receipt of a transition of care/referral summary formatted according to the standards adopted §170.205(a)(3) and §170.205(a)(4), technology must be able to demonstrate that the transition of care/referral summary received can be properly matched to the correct patient. (iii) *Reconciliation.* Enable a user to reconcile the data that represent a patient's active medication list, medication allergy list, and problem list as follows. For each list type: (A) Simultaneously display (i.e., in a single view) the data from at least two sources in a manner that allows a user to view the data and their attributes, which must include, at a minimum, the source and last modification date. (B) Enable a user to create a single reconciled list of each of the following: Medications; medication allergies; and problems. (C) Enable a user to review and validate the accuracy of a final set of data. (D) Upon a user's confirmation, automatically update the list, and incorporate the following data expressed according to the specified standard(s): (1) *Medications.* At a minimum, the version of the standard specified in §170.207(d)(3); (2) *Medication allergies.* At a minimum, the version of the standard specified in §170.207(d)(3); and (3) *Problems.* At a minimum, the version of the standard specified in §170.207(a)(4). *System verification.* Based on the data reconciled and incorporated, the technology must be able to create a file formatted according to the standard specified in §170.205(a)(4) using the Continuity of Care Document document template.
	To successfully complete the clinical task, participants were required to complete each of the following subtasks:
	Task B2.1: Patient record with a (C-CDA) summary care Task B2.2: Verify one or more CDS interventions Task B2.3: Export patient summary care (C-CDA)

Task Participant and Instructions

The instructions are provided with **Appendix 5.2** – Task Data sheet with Task numbers.

Data Analysis and Reporting

Table : Test results for each subtask in Implantable Device List task

	Measure						
	N	Task Success	Path Deviation	Task Time (Seconds)		Errors	Scenario Ratings (5=Easy)
Task	#	Percent (%)	Deviations (Observed / Optimal)	Mean (SD)	Deviations (Observed / Optimal)	Percent (%)	Mean (SD)
Task B2.1: Patient record with a (C-CDA) summary care	10	100%	6/6	25 (3)	25/20	0%	3.6 (0.5)
Task B2.2: Verify one or more CDS interventions	10	100%	10/9	25 (5)	25/20	0%	3.4 (0.5)

Task B2.3: Export patient summary care (C-CDA)	10	100%	8/8	17 (1)	17/15	0%	3.6 (0.5)

Error Analysis

No critical use errors were identified or observed as part of *'Clinical Information Reconcilation'* task.

Effectiveness

All participants, as suggested by timings by expert users, were able to perform the tasks within opital number of steps and time.

Efficiency

No additional opportunity is observed for improving efficiency.

Satisfaction

Average success score of the participants was 3.5˜ on average based on 5 point Likert-type scale.

Major Findings

Performance of three sub-groups are 100% rate.

Areas for Improvement

No additional areas for improvement related to effectiveness and efficiency determined.

4.12 Criteria 170.315(b)(3) e-Prescribing

Task Mapping

The table maps the '*e-Prescribing'* criteria to usability test tasks to aid verification that the report will contain all required test scenarios for this EHR capability submitted for testing.

Table : 'e-Prescribing' usability test criteria and tasks

	'e-Prescribing*'* test criteria and expectations are stated below.
	(i) Enable a user to perform all of the following prescription-related electronic transactions in accordance with the standard specified in §170.205(b)(2) and, at a minimum, the version of the standard specified in §170.207(d)(3) as follows: (A) Create new prescriptions (NEWRX). (B) Change prescriptions (RXCHG, CHGRES). (C) Cancel prescriptions (CANRX, CANRES).

	(D) Refill prescriptions (REFREQ, REFRES). (E) Receive fill status notifications (RXFILL). (F) Request and receive medication history information (RXHREQ, RXHRES). (ii) For each transaction listed in paragraph (b)(3)(i) of this section, the technology must be able to receive and transmit the reason for the prescription using the diagnosis elements in DRU Segment. (iii) *Optional.* For each transaction listed in paragraph (b)(3)(i) of this section, the technology must be able to receive and transmit the reason for the prescription using the indication elements in the SIG Segment. (iv) Limit a user's ability to prescribe all oral liquid medications in only metric standard units of mL (i.e., not cc). (v) Always insert leading zeroes before the decimal point for amounts less than one and must not allow trailing zeroes after a decimal point when a user prescribes medications.
	To successfully complete the clinical task, participants were required to complete each of the following subtasks:
	Task B3.1: Create new prescriptions Task B3.2: Change prescriptions Task B3.3: Cancel prescriptions Task B3.4: Refill prescriptions (Status) Task B3.5: Medication history (Request, Recieve) Task B3.6: Limit a user's ability to prescribe

Task Participant and Instructions

The instructions are provided with **Appendix 5.2** – Task Data sheet with Task numbers.

Data Analysis and Reporting

Table: e-Prescribing usability test criteria and tasks

	Measure						
	N	Task Success	Path Deviation	Task Time (Seconds)		Errors	Scenario Ratings (5=Easy)
Task	#	Percent (%)	Deviations (Observed / Optimal)	Mean (SD)	Deviations (Observed / Optimal)	Percent (%)	Mean (SD)
Task B3.1: Create new prescriptions	10	100%	15/14	46 (2)	46/42	0%	3.1 (0.5)
Task B3.2: Change prescriptions	10	100%	15/14	45 (2)	45/42	0%	3.1 (0.5)
Task B3.3: Cancel prescriptions	10	100%	15/14	45 (2)	45/42	0%	3.1 (0.7)
Task B3.4: Refill prescriptions (Status)	10	100%	11/10	43 (4)	43/35	0%	3.5 (0.5)
Task B3.5: Medication history (Request, Recieve)	10	100%	11/11	46 (3)	46/43	0%	3.0 (0.6)

Task B3.6: Limit a user's ability to prescribe	10	100%	18/18	58 (7)	58/50	0%	3.1 (0.5)

Error Analysis

NIST e-Prescribe tool is used to test several steps in 'e_prescribing' task. Hypothetic patient and medical data are specially created for conduct of this test correctly.

Effectiveness

'e-Prescribing' test was conducted with the participation of fewer participants compated to other tests. Participants only completed recording and submission stages as mentioned in the test instructions without having knowledge on integration phases operating in the system's background.

Efficiency

No additional opportunity is observed for improving efficiency

Satisfaction

Average success score of the participants was 3-3.4~on average based on 5 point Likert-type scale

Major Findings

Performance of four sub-groups are 100% rate.

Areas for Improvement

No additional areas for improvement related to effectiveness and efficiency determined.

5. Appendix

5.1-Recruiting Screener

The purpose of this screener is to ensure that the participants selected represent the target user population as closely as possible. The information in this screener is used to enter demographic information in pariticipants section of this report. The participants who filled this screener and enrolled in the test are assigned ID numbers according to their roles. These IDs represented the participants in all numerical measurements.

Test participants are told that they should meet the following criteria;

- Entering patient information in clinical stages and operating with medical information
- Familiarity with data entry to Professional Healthcare Record

- Responding to survey questions.

Screener Questions:

1. What is your name?

2. What is your gender? [Female, Male]

3. What is your age range? [20-29, 30-39, 40-49, 50-59, 60-69]

4. What is your highest level of education? [LPN, RN, NP, AD, PA, BD, MD, Other]

5. What is your occupation or role? [Doctor, Nurse, IT Expert, IT Manager, Medical Data Entry Expert]

6. How many months/year(s) of experience do you have in this occupation or role?

7. How many months/year(s) of computer experience do you have?

8. How many months/year(s) have you used a Professional Electronic Health Record (EHR)?

9. Do you need assistive technological devices such as screensaver, etc.?

5.2- Task Data Sheets

Tasks are created with the goal of completion within the shortest time and in accordance with ONC test criteria. Some -obligatory- steps about functionality of the software are not included in test steps during the completion of tasks. For example, in a task about prescription, it is assumed that the procedures such as registration of patient, creation of protocol for patient by the system, payment to pay desk, etc. are completed successfully.

Tasks created below do not include the tasks that calculate numerical measurements of this report and do not contain all scenarios of the tasks. For example, opening of allergy data list is not included as a step in recording and re-arrangement of allergic warnings. But, exact time of opening allergy data list and number of steps taken until this action are recorded for the completion of task successfully in terms of numerical measurements.

1- Task Data Sheets for 170.315(a)(5) Demographics

Task A5.1: Record demographic data

- Firstly, make a new patient registration and fill demographic information as stated below:
- Patient Name : **Michael Edilson**
- Gender **: Male**
- Date of Birth : **05/06/1987**
- Preferred Language : **English**
- Nationality : **Declined to specify**
- Sexual Indentity : **Declined to specify**
- Ethnic Origin : **Declined to specify**
- Sexual Orientation : **Declined to specify**
- Click Save button to record entered information

Task A5.2: **Change** demographic data

- Change information of the patient entered in the previous task. Please open patient card of **Michael Edilson**, who is among the patients admitted today, and make changes according to the information stated below.
- Nationality : **White, Asian**
- Ethnic Origin : **Not Hispanic or Latino**
- Sexual Orientation: **Don't know**
- Click Save button to record entered information and close the window

Task A5.4: **Record** preliminary cause & death of date

- Open list of hospitalized patients and open ***Death Information*** form of **Jennifer Rose**, whose other information was entered before for test purposes.
- Apart from the information obligatory to be filled, enter two information stated below
- Preliminary Cause of Death : **Work Accident**
- Date - Time : **03/02/2018 16:25**
- Click Save button to record entered information and close the window.

Task A5.5: **Change** preliminary cause & death of date

- Open list of hospitalized patients and open ***Death Information*** form of **Jennifer Rose**, whose other information was entered before for test purposes. Change 'Cause of Death' information entered in previous task.
- Preliminay Cause of Death : **Traffic Accident**
- Date - Time : **01/02/2018 16:25**
- Click Save button to record entered information and close the window.

-Please notify when task is completed !

-Do you have any question before commencing the task ?

2- Task Data Sheets for 170.315(a)(1) CPOE Mediations

Task A1.2: Select patient's record & enter order

- Open patient list on Doctor Polyclinic Procedures and open examination form of **Alice Jones**, whose registration is already made before for test purposes, and open Prescription screen.
- From Drug List : Select **Amoxil Forte 250/50 ml and add to the prescription.**
- Frequence Type : **Select twice daily, once in every 12 hours**.
- Type of usage : **Select 'Oral'**
- Click Save button to record entered information and close the window.

Task A1.3: Select patient's record & change order

- Open examination form of **Alice Jones,** whose information is entered in the previous task, and open Prescription screen.
- From 'Previous Prescriptions', open prescription information entered in the previous task.
- Frequence Type : **Select three times daily, once in every 6 hours**.
- Click Save button to record entered information and close the window.

-Please notify when task is completed !
-Do you have any question before commencing the task ?

3- Task Data Sheets for 170.315(a)(2) CPOE Laboratory

Task A2.2: Select patient's record & enter order

- Open patient list on Doctor Polyclinic Procedures and open examination form of **Alice Jones**, whose registration is already made before for test purposes, and open Service Record screen.
- Click 'New Record' button and mark **HDL Cholesterol , LDL Cholesterol** and **Albumin from** Laboratory Service List.
- Save procedures and close the window

Task A2.3: Select patient's record & change order

- Open patient list on Doctor Polyclinic Procedures and open examination form of **Alice Jones**, whose registration is already made before for test purposes, and open Service Record screen.
- Open service records entered in the previous task on 'Service Record'.
- Select HDL Cholesterol laboratory test and change the **time of entry of service**.
- **Add High Cholesterol** for **Reason For order**.
- Save procedures and close the window

-Please notify when task is completed !
-Do you have any question before commencing the task ?

4- Task Data Sheets for 170.315(a)(2) CPOE Radiology

Task A3.2: Select patient's record & enter order

- Open patient list on Doctor Polyclinic Procedures and open examination form of **Alice Jones**, whose registration is already made before for test purposes, and open Service Record screen.
- Click 'New Record' and mark **Liver CT** and **Liver CT Contrast tests on** the Radiology Service List.
- Save procedures and close the window

Task A3.3: Select patient's record & change order

- Open patient list on Doctor Polyclinic Procedures and open examination form of **Alice Jones**, whose registration is already made before for test purposes, and open Service Record screen.
- Open service records entered in the previous task on 'Service Record'.
- **Select Liver CT Contrast** Radiology test request and check **Emergency** box.
- **Add Cholesterol Control** for **Reason For order**.
- Save procedures and close the window

-Please notify when task is completed !
-Do you have any question before commencing the task ?

5- Task Data Sheets for 170.315(a)(8) Medication Allergy

Task A8.1: Select patient's record & enter allergy

- Select a patient from list of outpatients and open 'Drug Allergy Warnings' screen.
- Enter a new allergy information as stated below.
- Allergy : **Penisilin G**
- Starting Date: **05/08/2015**
- Reaction : **Fever**
- Severity : **Severe**
- Save procedures and close the window

Task A8.3: Select patient's record & change allergy

- Open 'Drug Allergy Warnings' screen for the patient whose information was entered in the previous procedure.
- Open the 'Allergy' information entered in the previous procedures and change the information as stated below.
- Starting Date : **10/08/2015**
- Reaction: **Hives**

- Status : **Active**
- Save procedures and close the window

Task A8.4: Select patient's record & enter allergy (For inpatient)

- Select a patient from the list of hospitalized patients and open 'Drug Allergy Warnings'.
- Enter a new allergy information as stated below.
- Allergy : **Cefadroxil**
- Starting Date : **01/03/2015**
- Reaction : **Cough**
- Severity : **Mild**
- Status : **Inactive**
- Save procedures and close the window

Task A8.6: Select patient's record & change allergy (For inpatient)

- Open the allergy information entered during the A8.4 task and change the information as stated below.
- Allergy : **Carbamazepine**
- Reaction : **Fever**
- Status : **Active**
- Save procedures and close the window

-Please notify when task is completed !
-Do you have any question before commencing the task ?

6- Task Data Sheets for 170.315(a)(6) Problem List

Task A6.1: Select patient's record & enter problem

- Select a patient from patient list on Doctor Polyclinic Procedures and open 'Problem List' from patient's examination form
- Select the diagnosis stated below from the list opened after entering a new problem information and enter other information.
- Problem : **Continuous Fever, ICD10: P81.9, SNOMED:271751000**
- Starting Date : **04/01/2015**
- Status : **Active**
- Save procedures and close the window

Task A6.3: Select patient's record & change problem

- Open the problem information entered in the A6.1 task and change information as stated below
- Problem : **Fever, ICD10: P81.9, SNOMED:386661006**

- Starting Date : **04/01/2015**
- Status: **Solved**
- Save procedures and close the window

Task A6.4: Select patient's record & enter problem (for inpatient)

- Select a patient from hospitalized patients and open 'Problem List' screen.
- Select the diagnosis stated below from the list opened after entering a new problem and enter other information.
- Problem : **Anemia of chronic disorder, ICD10:D63.1, SNOMED:234347009**
- Starting Date : 04/02/2015
- Status : Active
- Save procedures and close the window

Task A6.6: Select patient's record & change problem (for inpatient)

- Open the problem information entered in the A6.4 task and change with the information stated below.
- Problem : **Chronic anemia, ICD10:D63.1, SNOMED:191268006**
- Save procedures and close the window

-Please notify when task is completed !
-Do you have any question before commencing the task ?

7- Task Data Sheets for 170.315(a)(14) Implantable Device List

Task A14.1: Record & Parse Unique Device Identifiers (UDI)

- Open Daily Patient List and then open Prosthesis Record screen.
- Open a new record window and enter device definition code below
- Device UDI :
  (01) 00814289020662(17)161211(21)A506
- Implantable Date : **05/01/2016**
- Control data record created after the added code and close the window
- Open Daily Patient List and then open Prosthesis Record screen.
- Open a new record page and enter device definition code below
- Device UDI :
  =/00841036212797=,000025=A99971312345600=>014032=}013032&,1000000000000XYZ123
- Implantable Date : **05/06/2016**
- Control data record created after the added code and close the window

Task A14.2, Task A14.3 : Description of Implantable device, Access Display Implantable Device

- Open information entered during the A14.1 task and check correctness (automatic creation) of the information as stated below.
  (Repeat this procedure for all UDI records)
- Device Identifier
- Lot Number, Serial Number, Manufacture Date,
- Expration Date, Identification Code, GMDN PT Name,
- MRI Safety, Company Name, Issuing Agency , Device Description , Labeled Contains NRL
- Close the window

Task A14.4 : Change status of unique device identifier

- Open Device UDI information entered during A14.4 task and change information as stated below.
- Device Status : **Removed**
- Removal Date : **05/05/2016**
- Close the window

-Please notify when task is completed !
-Do you have any question before commencing the task ?

8- Task Data Sheets for 170.315(a)(4) Drug-Drug / Drug -Allergy checks

Task A4.1 : Review and action upon Drug-Drug interaction alert

- Open patient list on Doctor Polyclinic Procedures and open examination form of **Alice Jones**, whose registration is already made before for test purposes, and open Prescription screen.
- Check whether patient warning notifications are active.
- From Drug List : Select **Ciprofloxacin and add to the prescription** (Make a new prescription if the patients does not have any prescription record)
- Check whether the warning appear on related fields, check Drug-Drug interaction details.
- Close the window

Task A4.2 : Review and action upon Drug-Allergy interaction alert

- Open patient list on Doctor Polyclinic Procedures and open examination form of **Alice Jones**, whose registration is already made before for test purposes, and open Prescription screen.
- Check whether patient warning notifications are active.
- From Drug List : Select **Amoxicillin and add to the prescription**
- Open patient allergy list and add **Ampicillin**.

- Check whether the warning appear on related fields, check drug-allergy interaction details.Close the window

Task A4.3 : Update Setting, Interaction Severity Level

- Login to the software as system administrator and enter **drug-drug interaction** information on Drug Interactions Definitions Form according to the information below.
- Ingredient Name : **Tipro-Tizanid**
- Interaction 1. Drug : **Ciprofloxacin (Cipro)**
- Interaction 2. Drug: **Tizanidine (Zanaflex)**
- Allergy Severity : **Mild**
- Explanation, Reaction : **Combination may increase**
- Save the procedure and close the window

- Login to the software as system administrator to the software and change the **drug-drug interaction** information, which was entered in the previous step, on Drug Interactions Definitions Form as stated below.
- Allergy Severity : **Severe**
- Explanation, Reaction : **CV / CNS Effects**
- Save the procedure and close the window

- Login to the software as system administrator and change **drug-allergy interaction** information as stated below.
- Ingredient Name : **Amo-Ampi**
- Interaction Drug: **Amoxicillin (Augmentin)**
- Interaction Allergy : **Ampicillin (Unasyn)**
- Severity : **Weak**
- Explanation, Reaction : **Hives**
- Save the procedure and close the window

Task A4.4 : Update Setting, Interaction Alert

- Login as an ordinary user to the software and change **drug-drug interaction** information as stated below.
- Inform the Moderator in case the system cannot be accessed.
- Login to the software as system administrator and authorize the Nurse Group users to open Drug Interactions Definition Form.
- Login to the system as a user from the nurse group.
- Open Drug Interactions Definition Form.
- Inform the Moderator in case the system is accessed.
- Close the window.

-Please notify when task is completed !

-Do you have any question before commencing the task ?

9- Task Data Sheets for 170.315(b)(3) e-Prescribe

In this section, in order to fulfill steps of the e-Prescribe task, the **NIST** test tools are used. During this process, the steps specified in ONC certification test plan and applicability of the test are controlled.

The elements such as User, Pharmacy, The Written Prescription, Patient and and some other items are entered default information, while the users are requested to complete particular steps.

Task B3.1: Create new prescriptions

- Login to the system with the user of **Rober Crawley's** credentials.
- Select **Sophia Biscayne** from the list on Doctor Polyclinic Procedures and open prescription screen of the patient.
- Create a new prescription and select **Procardia XL 30 MG Oral Tablet** from drug list**.**
- Enter instructions for drug use as follows: **Take 1 tablet a day by mouth for seven days, then take 2 tablets by mouth once a day.**
- Proceed to the e-Prescription screen and select Pharmacy as "Mail Order Pharmacy 10.6MU NOCS".
- Select type of prescription submission as **New Prescription** and click 'send' button.
- Inform the Moderator about the result of the prescription submission.

Task B3.2: Change prescriptions

- Login to the system with the user of **Rober Crawley's** credentials.
- Select **Sophia Biscayne** from the list on Doctor Polyclinic Procedures and open prescription screen of the patient.
- Control whether there is change request in prescription list for **Procardia** drug, which was prescribed in the **Task B3.1.**
- Create a new submission record on e-Prescription screen and select type of submission as Change Response and click 'send' button.
- Inform the Moderator about the result of the prescription submission.

Task B3.3: Cancel prescriptions

- Login to the system with the user of **Anna Bates**' credentials.
- Select **Susanne Adirondack** from the list on Doctor Polyclinic Procedures and open prescription screen of the patient.
- Check whether **Hydrochlorothiazide 50 MG Tablet** is in the prescription list.
- Proceed to the e-Prescription screen and enter a new submission record, select type of submission as **Cancel Prescription** and click 'send' button.
- Inform the Moderator about the result of the prescription submission.

Task B3.4: Refill prescriptions (Status)

- Login to the system with the user of **Ivy Stuart**'s credentials.
- Select **Elizabeth Itasca** from the list on Doctor Polyclinic Procedures and open prescription screen of the patient.
- Check whether **Lanoxin 125 MCG Oral Tablet** is in the prescription list. Inform the Moderator if the status of drug is set as "**Refill Request**" or not.
- Proceed to the e-Prescription screen and enter a new submission record, select type of submission as **Refill Prescription** and enter the status of drug as "**Approved"** and click 'send' button.
- Inform the Moderator about the result of the prescription submission.

-Please notify when task is completed !
-Do you have any question before commencing the task ?

5.3 Participant Orientation

The participants were given short training and the instructions below were read out to them before the initiation of the test. The participants had prior experience with the Sisohis modules which they frequently use in the healthcare institutions they are employed. Therefore they were not required to be given an extensive training about computer use and the software.

Following instructions were read out to them before test and measurement procedures:

1) The test measures usability of the system. It does not measure your skills in using the system.

2) Each task shall be initiated from the outset.

3) A written copy of tasks shall be handed out.

4) Work in your own pace and perform only the specifically selected steps.

5) Since various functions are tested, you may not be able to complete all workflow in a given task with only one patient.

6) There might be more than one path to complete a task. You can complete the task by following the easiest path for you.

7) Notify the Moderator when you **completed** the task or inform the Moderator about any warning in a given task scenario.

8) After each task, enter the percentage of **Task Completion**.

9) After completion of all tasks, you shall fill out a **questionnaire** about your experience.

10) After completion of all tasks, you shall express your opinions on the system verbally to the moderator.

11) Save your comments until the completion of all tasks.

11) Save your comments until the completion of all tasks. The moderator shall not provide assistance to the participants during the test or shall not respond to the participants' questions.

12) All the information provided by you shall remain confidential and you will be identified by your ID's instead of names throughout the report.

5.4 Informed Consent Form

This evaluation is about configuring the SisoHis.

The purpose of this study is to gather feedback about the effectiveness and efficiency of the SisoHis V2.0 EHR.

I agree to treat all confidential information received during this evaluation in accordance with this nondisclosure agreement.

Accordingly, I will not disclose confidential information to any third parties I authorize User-View and their client to keep, use in any manner and dispose of the findings from this evaluation, including my feedback and opinions expressed.

I understand that my participation is completely voluntary and that I may leave at any time.

_____ _____

Name Date and Signature

5.5- System Usability Scale, (SUS)

In order to quickly assess opinions of users expressed during their experience with system, System Usability Scale (SUS) methods are used. Details on calculaiton of the SUS can be accessed through this link (*http://www.usabilitynet.org/trump/documents/Suschapt.doc*)

Please Evaluate Functionality

This scale, measures your general impression on the test conducted today.

1 - Strongly Disagree, 2 – Disagree, 3 – Neutral, 4 – Agree, 5 - Strongly Agree

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