



Electronic Health Record Usability Testing
(EHRUT) Report



EHR Usability Test Report of InSync v9.0

InSync v9.0

Date of Usability Test: December 27, 2018
 Date of Report: December 27, 2018
 Report Prepared By: InSync Healthcare Solutions LLC
 Subrata Choudhury, Director – Software Development
 Email to: subrata.choudhury@insynchcs.com
 8408 Benjamin Road, Tampa, FL 33634
 Phone: 877-246-8484
 Fax: 732-256-2092
<http://www.insynchcs.com>

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1. EXECUTIVE SUMMARY

A usability test of InSync v 9.0 Complete EHR Ambulatory was conducted by InSync Healthcare Solutions via online one-to-one GoToMeeting sessions with the test participants on December 27, 2018. 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, 10 healthcare providers matching the target demographic criteria served as participants and used the EHRUT in simulated, but representative tasks.

This study collected performance data on 12 tasks typically conducted on an EHR:

1. § 170.315 (a)(1) Computerized Provider Order Entry (CPOE) – medications
2. § 170.315 (a)(2) CPOE – laboratory
3. § 170.315 (a)(3) CPOE – diagnostic imaging
4. § 170.315 (a)(4) Drug-drug, Drug-allergy Interaction Checks for CPOE
5. § 170.315 (a)(5) Demographics
6. § 170.315 (a)(6) Problem List
7. § 170.315 (a)(7) Medication List
8. § 170.315 (a)(8) Medication Allergy List
9. § 170.315 (a)(9) Clinical Decision Support
10. § 170.315 (a)(14) Implantable Device List
11. § 170.315 (b)(2) Clinical Information Reconciliation and Incorporation
12. § 170.315 (b)(3) Electronic Prescribing

During the one-on-one usability test, the administrator introduced the test, and instructed participants to complete a series of tasks (given one at a time) using the EHRUT. Out of 10 participants, 1 participant had 5+ years of previous experience with EHR software. During the testing, the administrator timed the test and recorded user performance data on paper and electronically. The administrator did not give the participant assistance in how to complete the task.

The Customized Common Industry Format Template for Electronic Health Record Usability Testing (NISTIR 7742) is used for usability test reports (ISO/IEC 25062:2006(E)).

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

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



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Task#	Measure	Task Success (Percentage Success / Failure)	Path Deviation (Observed / Optimal)	Path Deviation Mean (SD)	Task Time Deviations (Observed / Optimal)	Errors Mean (SD)	Task Ratings 5=Easy Mean (SD)
Task 1	Record Medication Order	100/0	14/12	14.2 (1.62)	31.5/30	0 (0)	4.3 (0.48)
Task 2	Change Medication Order	100/0	16/14	15.6 (1.58)	39.3/40	0 (0)	4.2 (0.63)
Task 3	Access Medication Order	100/0	5/4	5 (0.95)	9.4/10	0 (0)	4.3 (0.67)
Task 4	Record Laboratory Order	100/0	11/9	11 (1.42)	21.6/20	0 (0)	3.8 (0.92)
Task 5	Change Laboratory Order	100/0	9/8	8.8 (0.92)	20.9/20	0 (0)	3.7 (0.95)
Task 6	Access Laboratory Order	100/0	3/3	2.7 (0.68)	9.1/10	0 (0)	4 (0.82)
Task 7	Record Radiology/Imaging Order	100/0	6/5	5.8 (0.64)	21.7/20	0 (0)	3.8 (0.92)
Task 8	Change Radiology/Imaging Order	100/0	6/5	6.1 (1.6)	22.3/20	0 (0)	3.7 (0.82)
Task 9	Access Radiology/Imaging Order	100/0	5/5	4.8 (0.79)	14.6/15	0 (0)	3.8 (0.92)
Task 10	Interact with Create drug-drug and drug allergy interventions prior to Medication Order completion	100/0	11/9	10.6 (1.18)	40.3/40	0 (0)	4.2 (0.79)
Task 11	Adjustment of severity level of drug-drug interventions	80/20	10/8	9.5 (2)	34.88/35	0.2 (0.43)	3.88 (0.99)
Task 12	Record Medication List	100/0	9/7	9.1 (0.88)	35.4/35	0 (0)	4.1 (0.57)
Task 13	Change Medication List	100/0	10/7	9.8 (1.48)	35.9/35	0 (0)	4.3 (0.48)
Task 14	Access Medication List	100/0	5/4	5.1 (0.88)	9.5/10	0 (0)	4.4 (0.52)
Task 15	Record Allergy List	100/0	8/7	8.4 (1.08)	25/25	0 (0)	4.3 (0.67)
Task 16	Change Allergy List	100/0	10/8	10.2 (1.62)	25/25	0 (0)	4.3 (0.67)
Task 17	Access Allergy List	100/0	8/6	7.5 (0.98)	9.6/10	0 (0)	4.4 (0.52)
Task 18	Electronic Prescribing	100/0	15/12	14.8 (1.04)	33.5/30	0 (0)	3.9 (0.88)
Task 19A	Configuration of CDS interventions (for medication list) by user	100/0	7/5	7.1 (1.29)	20.9/20	0 (0)	3.7 (0.95)
Task 19B	Medication List Interventions	100/0	14/12	13.5 (1.65)	39.6/40	0 (0)	3.9 (0.88)
Task 20A	Configuration of CDS interventions (for medication allergy list) by user	100/0	7/5	6.9 (1.38)	21.2/20	0 (0)	3.7 (0.95)



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Task 20B	Medication Allergy List Interventions	100/0	8/7	8.4 (1.08)	25.1/25	0 (0)	3.7 (0.95)
Task 21A	Configuration of CDS interventions (for problem list) by user	100/0	7/5	7.2 (1.55)	30.8/30	0 (0)	3.5 (0.85)
Task 21B	Problem List Interventions	100/0	7/6	6.8 (1.23)	36.2/40	0 (0)	3.8 (1.03)
Task 22A	Configuration of CDS interventions (for demographics) by user	100/0	6/5	6.4 (1.27)	20.5/20	0 (0)	3.9 (0.99)
Task 22B	Demographics Interventions	100/0	6/4	6.2 (1.04)	14.7/15	0 (0)	4.1 (0.88)
Task 23A	Configuration of CDS interventions (for lab test) by user	100/0	6/5	5.7 (0.68)	18.8/20	0 (0)	3.8 (0.92)
Task 23B	Lab Test Interventions	100/0	7/6	6.9 (0.88)	24.4/25	0 (0)	3.7 (0.95)
Task 24A	Configuration of CDS interventions (for lab result) by user	100/0	8/6	8.3 (1.16)	22.5/20	0 (0)	3.7 (0.95)
Task 24B	Lab Result Interventions	100/0	8/6	8 (0.82)	24.7/25	0 (0)	3.7 (0.95)
Task 25A	Configuration of CDS interventions (for vital signs) by user	100/0	7/5	6.9 (1)	21/20	0 (0)	3.9 (0.99)
Task 25B	Vital Signs Interventions	100/0	7/6	6.6 (0.7)	35.1/40	0 (0)	3.9 (0.99)
Task 26A	Configuration of CDS interventions (for User Diagnostic and Therapeutic Reference) by user	100/0	8/6	7.6 (0.97)	21.1/20	0 (0)	3.7 (0.95)
Task 26B	Identify User Diagnostic and Therapeutic Reference Information	100/0	8/7	7.5 (0.85)	36/40	0 (0)	3.6 (0.97)
Task 27	Reconcile patient's active medication list with another source	90/10	10/9	9.67 (0.71)	46.56/50	0.1 (0.32)	4.11 (0.78)
Task 28	Reconcile patient's active problem list with another source	90/10	10/9	10.44 (0.89)	49.34/50	0.1 (0.32)	3.89 (0.93)
Task 29	Reconcile patient's active medication allergy list with another source	90/10	11/9	10.56 (1.59)	49.45/50	0.1 (0.32)	4.11 (0.78)



Task 30	Record patient's demographic information.	100/0	5/4	5.4 (1.18)	28.4/30	0 (0)	4.3 (0.67)
Task 31	Change patient's demographic information.	100/0	6/5	6.4 (1.27)	25/25	0 (0)	4.3 (0.67)
Task 32	Access patient's demographic information.	100/0	3/3	3 (0.48)	8.8/10	0 (0)	4.4 (0.52)
Task 33	Record patient's Problem List.	100/0	9/8	8.6 (0.85)	33.2/35	0 (0)	4.3 (0.67)
Task 34	Edit patient's Problem List.	100/0	8/7	8 (0.95)	28.9/30	0 (0)	4.1 (0.74)
Task 35	Access patient's historical and current Problem List.	100/0	7/5	7 (0.95)	26/25	0 (0)	4 (0.82)
Task 36	Locate the new Implantable Device section.	100/0	8/6	7.5 (0.98)	26.2/25	0 (0)	4.4 (0.7)
Task 37	Add the new Implantable Device section.	100/0	10/9	9.7 (1.34)	33.9/35	0 (0)	4.4 (0.7)
Task 38	Change the new Implantable Device section.	100/0	10/8	10 (1.42)	30.8/30	0 (0)	4.4 (0.7)
Task 39	Access the new Implantable Device section.	100/0	9/7	8.8 (1.32)	25/25	0 (0)	4.5 (0.53)

The results from the SUS (System Usability Scale) scored the subjective satisfaction with the system based on performance with these tasks to be: **88**.

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

Major Findings

- Overall all the tasks were found very much user-friendly.
- Users were comfortable performing the tasks and they were found satisfied with their experience with the system.
- The new layout was very much appreciated by some of the participants.
- Medication module needed some level of guidance, after that, participants found it easy to test the tasks.



Areas for Improvement

- Considering the overall feedback from the participants, the workflows were very easy to perform. The users were quite comfortable to perform the tasks that were given to them. Overall layout and smart search features were very much useful for the participants; however, few cosmetic changes were suggested that can be taken care of while designing the new features in future.



2. INTRODUCTION

The EHRUT(s) tested for this study was InSync Version 9.0 Complete EHR Ambulatory, designed to record and present medical information to healthcare providers in practicing in specialty such as, internal medicine, pediatrics, orthopedic, Mental and Behavioral Health, Physical Therapy, etc. The EHRUT consists of modules to document patient visits along with full medical information, including patient's medical, social, surgical, and family history, vitals, physical exam findings, review of systems, problem list, chief complaints, medications & allergies, diagnosis, immunizations, health maintenance, and the complete treatment plan. 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, the time taken to complete a task, and the user's level of comfort and positive attitude towards the system, were captured during the usability testing.



3. METHOD

3.1 PARTICIPANTS

A total of 10 participants were tested on the EHRUT(s). Participants in the test were mainly medical assistants serving in the healthcare industry. Participants were selected by InSync Healthcare Solutions 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.

For the test purposes, end-user characteristics were identified and used to select potential participants.

Recruited participants had mixed 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.

Sr. No.	Part ID	Gender	Age Range In years	Education	Occupation / Role	Professional experience (in months)	Computer experience (in months)	Product experience (in months)	Previous EHR Experience	Assistive Technology Needs
1	User 01	Female	30-39	Bachelor's degree	RN	120	240	36	Yes	No
2	User 02	Female	30-39	High school graduate	MA	120	120	36	Yes	No
3	User 03	Female	30-39	High school graduate	P+A	120	120	36	Yes	No
4	User 04	Male	30-39	Bachelor's degree	Practice Administrator	96	96	84	No	No
5	User 05	Male	30-39	Master's degree	Physician Assistant	180	180	12	Yes	No
6	User 06	Female	30-39	Master's degree	MD	168	168	84	Yes	No
7	User 07	Female	20-29	Trade/technical/vocational training	Front Desk	48	48	4	None	No
8	User 08	Female	20-29	Trade/technical/vocational training	Medical Office Assistant	108	108	4	Yes	No
9	User 09	Female	30-39	Trade/technical/vocational training	LPN	84	84	24	Yes	No
10	User 10	Female	20-29	Associate degree	Medical Billing	60	36	36	Yes	No



All 10 participants (matching the demographics in the section on Participants) were recruited and all of them participated in the usability test. A document was sent to the participants to get their demographic characteristics as provided.

Participants were scheduled for 15 minute sessions with 5 minutes in between each session for debrief by the administrator to reset systems to proper test conditions. A spreadsheet was used to keep track of the participant schedule, and included each participant's demographic characteristics.

3.2 STUDY DESIGN

Overall, the objective of this test was to uncover areas where the application performed well – that is, effectively, efficiently, and with satisfaction – and areas where the application failed to meet the needs of the participants. The data from this test may serve as a baseline for future tests with an updated version of the same EHR and/or comparison with other EHRs provided the same tasks are used. In short, this testing serves as both a means to record or benchmark current usability, but also to identify areas where improvements must be made.

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

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

Additional information about the various measures can be found in Section 3.8 on Usability Metrics.

3.3 TASKS

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

1. Record Medication Order
2. Change Medication Order
3. Access Medication Order
4. Record Laboratory Order
5. Change Laboratory Order
6. Access Laboratory Order
7. Record Radiology/Imaging Order



8. Change Radiology/Imaging Order
9. Access Radiology/Imaging Order
10. Interact with drug-drug and drug-allergy interventions prior Medication Order completion
11. Adjustment of severity level of drug-drug interventions (may be an admin type function)
12. Record Medication List
13. Change Medication List
14. Access Medication List
15. Record Allergy List
16. Change Allergy List
17. Access Allergy List
18. Electronic Prescribing
19. Configuration of CDS interventions (for medication list) by user Medication List Interventions
20. Configuration of CDS interventions (for medication allergy list) by user Medication Allergy List Interventions
21. Configuration of CDS interventions (for problem list) by user Problem List Interventions
22. Configuration of CDS interventions (for demographics) by user Demographics Interventions
23. Configuration of CDS interventions (for lab test) by user Lab Test Interventions
24. Configuration of CDS interventions (for lab result) by user Lab Result Interventions
25. Configuration of CDS interventions (for vital signs) by user Vital Signs Interventions
26. Configuration of CDS interventions (for User Diagnostic and Therapeutic Reference) by user Identify User Diagnostic and Therapeutic Reference Information
27. Reconcile patient's active medication list with another source
28. Reconcile patient's active problem list with another source
29. Reconcile patient's active medication allergy list with another source
30. Record patient's demographic information
31. Change patient's demographic information
32. Access patient's demographic information
33. Record patient's Problem List
34. Edit patient's Problem List
35. Access patient's historical and current Problem List
36. Locate the new Implantable Device section
37. Add the new Implantable Device section
38. Change the new Implantable Device section
39. Access the new Implantable Device section



Tasks were selected based on their importance with relationship to Meaningful Use criteria and were prioritized in accordance with the complexity and risk associated with the likelihood of user errors.

3.4 PROCEDURES

Upon joining the meeting, participants were greeted by the administrator. Each participant acknowledged the meeting agenda and objective per orientation document sent by administrator beforehand. The administrator who conducted the usability testing was a Software Engineer who had experience of 8+ years in healthcare domain.

The administrator moderated the session including administering instructions and tasks. The administrator also monitored task times, obtained post-task rating data, took notes on participant comments, took notes on task success, number and type of errors, and 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.
- Without using a think aloud technique.

Task timing began once the administrator finished reading the question. The task time was stopped once the participant indicated they had successfully completed the task. Scoring is discussed below.

Following the test 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.

3.5 TEST ENVIRONMENT

The EHRUT would typically be used in a healthcare office or facility. In this instance, the test was performed in a virtual setting, using one-on-one online GoToMeeting sessions. The participants joined the sessions from their respective work locations via a personal computer and browser. They accessed to the EHRUT via a dedicated and secure login.

For testing, the computers ran Windows 7 as an operating system. The participants used mouse and keyboard when interacting with the EHRUT. The environment setup with display monitor size of 19 inch with screen resolution 1280 x 1024. Color Settings data was not collected during the test. The application was set up by the vendor.

The application was running on a web using a test database on a WAN connection. The system performance was representative to what actual users would experience in a field implementation. Additionally, participants were instructed not to change any of the default system settings.



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3.6 TEST FORMS AND TOOLS

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

- Pre-test Questionnaire
- Post-test Questionnaire

3.7 PARTICIPANT INSTRUCTIONS

The administrator read the following instructions to each participant.

Thank you for participating in this study. Your input is very important. Our session today will last about 150 minutes. 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. 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 5 minutes to explore the system and make comments.

Participants were then given the tasks mentioned in this report to complete.

3.8 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



3.8.1 DATA SCORING

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

Measures	Rationale and Scoring
<p>Effectiveness: Task Success</p>	<p>A task was counted as a “Success” if the participant was able to achieve the correct outcome, without assistance, <u>within the time allotted on a per task basis</u>. (Refer to “Task Success” column in table).</p> <p>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.</p> <p>Task times were recorded for successes. Average of observed task times was used and shown against optimal time to measure optimal efficiency. (Refer to “Task Time Deviations” column in table).</p>
<p>Effectiveness: Task Failures</p>	<p>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 “Failures.” No task times were taken for errors.</p> <p>The total number of errors was calculated for each task and then divided by the total number of times that task was attempted. The percentage of failure records were shown in the “Task Success (Percentage Success / Failure)” column in table.</p>
<p>Efficiency: Task Deviations</p>	<p>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. Mean and Standard Deviation were calculated based on the total number of steps used in actual path. Refer to the “Path Deviation” column in the table.</p>
<p>Efficiency: Task Time</p>	<p>Optimal time was decided for each task. Actual time taken by the participants for each task was recorded. Average time per task was calculated for each task. Task Time Deviations were recorded as Observed Vs. Optimal. Refer to the “Task Time Deviations” column in the table.</p>
<p>Satisfaction: Task Rating</p>	<p>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. Refer to “Task Ratings” column in the table.</p>



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."

4. RESULTS

4.1 DATA ANALYSIS AND REPORTING

The results of the usability test were calculated according to the methods specified in the Usability Metrics section above.

The usability testing results for the EHRUT are detailed below.

Task#	Measure	Task Success (Percentage Success / Failure)	Path Deviation (Observed / Optimal)	Path Deviation Mean (SD)	Task Time Deviations (Observed / Optimal)	Errors Mean (SD)	Task Ratings 5=Easy Mean (SD)
Task 1	Record Medication Order	100/0	14/12	14.2 (1.62)	31.5/30	0 (0)	4.3 (0.48)
Task 2	Change Medication Order	100/0	16/14	15.6 (1.58)	39.3/40	0 (0)	4.2 (0.63)
Task 3	Access Medication Order	100/0	5/4	5 (0.95)	9.4/10	0 (0)	4.3 (0.67)
Task 4	Record Laboratory Order	100/0	11/9	11 (1.42)	21.6/20	0 (0)	3.8 (0.92)
Task 5	Change Laboratory Order	100/0	9/8	8.8 (0.92)	20.9/20	0 (0)	3.7 (0.95)
Task 6	Access Laboratory Order	100/0	3/3	2.7 (0.68)	9.1/10	0 (0)	4 (0.82)
Task 7	Record Radiology/Imaging Order	100/0	6/5	5.8 (0.64)	21.7/20	0 (0)	3.8 (0.92)
Task 8	Change Radiology/Imaging Order	100/0	6/5	6.1 (1.6)	22.3/20	0 (0)	3.7 (0.82)
Task 9	Access Radiology/Imaging Order	100/0	5/5	4.8 (0.79)	14.6/15	0 (0)	3.8 (0.92)
Task 10	Interact with Create drug-drug and drug allergy interventions prior to Medication Order completion	100/0	11/9	10.6 (1.18)	40.3/40	0 (0)	4.2 (0.79)
Task 11	Adjustment of severity level of drug-drug interventions	80/20	10/8	9.5 (2)	34.88/35	0.2 (0.43)	3.88 (0.99)
Task 12	Record Medication List	100/0	9/7	9.1 (0.88)	35.4/35	0 (0)	4.1 (0.57)
Task 13	Change Medication List	100/0	10/7	9.8 (1.48)	35.9/35	0 (0)	4.3 (0.48)



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Task 14	Access Medication List	100/0	5/4	5.1 (0.88)	9.5/10	0 (0)	4.4 (0.52)
Task 15	Record Allergy List	100/0	8/7	8.4 (1.08)	25/25	0 (0)	4.3 (0.67)
Task 16	Change Allergy List	100/0	10/8	10.2 (1.62)	25/25	0 (0)	4.3 (0.67)
Task 17	Access Allergy List	100/0	8/6	7.5 (0.98)	9.6/10	0 (0)	4.4 (0.52)
Task 18	Electronic Prescribing	100/0	15/12	14.8 (1.04)	33.5/30	0 (0)	3.9 (0.88)
Task 19A	Configuration of CDS interventions (for medication list) by user	100/0	7/5	7.1 (1.29)	20.9/20	0 (0)	3.7 (0.95)
Task 19B	Medication List Interventions	100/0	14/12	13.5 (1.65)	39.6/40	0 (0)	3.9 (0.88)
Task 20A	Configuration of CDS interventions (for medication allergy list) by user	100/0	7/5	6.9 (1.38)	21.2/20	0 (0)	3.7 (0.95)
Task 20B	Medication Allergy List Interventions	100/0	8/7	8.4 (1.08)	25.1/25	0 (0)	3.7 (0.95)
Task 21A	Configuration of CDS interventions (for problem list) by user	100/0	7/5	7.2 (1.55)	30.8/30	0 (0)	3.5 (0.85)
Task 21B	Problem List Interventions	100/0	7/6	6.8 (1.23)	36.2/40	0 (0)	3.8 (1.03)
Task 22A	Configuration of CDS interventions (for demographics) by user	100/0	6/5	6.4 (1.27)	20.5/20	0 (0)	3.9 (0.99)
Task 22B	Demographics Interventions	100/0	6/4	6.2 (1.04)	14.7/15	0 (0)	4.1 (0.88)
Task 23A	Configuration of CDS interventions (for lab test) by user	100/0	6/5	5.7 (0.68)	18.8/20	0 (0)	3.8 (0.92)
Task 23B	Lab Test Interventions	100/0	7/6	6.9 (0.88)	24.4/25	0 (0)	3.7 (0.95)
Task 24A	Configuration of CDS interventions (for lab result) by user	100/0	8/6	8.3 (1.16)	22.5/20	0 (0)	3.7 (0.95)
Task 24B	Lab Result Interventions	100/0	8/6	8 (0.82)	24.7/25	0 (0)	3.7 (0.95)
Task 25A	Configuration of CDS interventions (for vital signs) by user	100/0	7/5	6.9 (1)	21/20	0 (0)	3.9 (0.99)
Task 25B	Vital Signs Interventions	100/0	7/6	6.6 (0.7)	35.1/40	0 (0)	3.9 (0.99)
Task 26A	Configuration of CDS interventions (for User Diagnostic and Therapeutic	100/0	8/6	7.6 (0.97)	21.1/20	0 (0)	3.7 (0.95)



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	Reference) by user						
Task 26B	Identify User Diagnostic and Therapeutic Reference Information	100/0	8/7	7.5 (0.85)	36/40	0 (0)	3.6 (0.97)
Task 27	Reconcile patient's active medication list with another source	90/10	10/9	9.67 (0.71)	46.56/50	0.1 (0.32)	4.11 (0.78)
Task 28	Reconcile patient's active problem list with another source	90/10	10/9	10.44 (0.89)	49.34/50	0.1 (0.32)	3.89 (0.93)
Task 29	Reconcile patient's active medication allergy list with another source	90/10	11/9	10.56 (1.59)	49.45/50	0.1 (0.32)	4.11 (0.78)
Task 30	Record patient's demographic information.	100/0	5/4	5.4 (1.18)	28.4/30	0 (0)	4.3 (0.67)
Task 31	Change patient's demographic information.	100/0	6/5	6.4 (1.27)	25/25	0 (0)	4.3 (0.67)
Task 32	Access patient's demographic information.	100/0	3/3	3 (0.48)	8.8/10	0 (0)	4.4 (0.52)
Task 33	Record patient's Problem List.	100/0	9/8	8.6 (0.85)	33.2/35	0 (0)	4.3 (0.67)
Task 34	Edit patient's Problem List.	100/0	8/7	8 (0.95)	28.9/30	0 (0)	4.1 (0.74)
Task 35	Access patient's historical and current Problem List.	100/0	7/5	7 (0.95)	26/25	0 (0)	4 (0.82)
Task 36	Locate the new Implantable Device section.	100/0	8/6	7.5 (0.98)	26.2/25	0 (0)	4.4 (0.7)
Task 37	Add the new Implantable Device section.	100/0	10/9	9.7 (1.34)	33.9/35	0 (0)	4.4 (0.7)
Task 38	Change the new Implantable Device section.	100/0	10/8	10 (1.42)	30.8/30	0 (0)	4.4 (0.7)
Task 39	Access the new Implantable Device section.	100/0	9/7	8.8 (1.32)	25/25	0 (0)	4.5 (0.53)



4.2 DISCUSSION OF THE FINDINGS

4.2.1 EFFECTIVENESS

In general, the system tested was found to be effective based on task success. Total 39 tasks were performed. 35 out of the 39 tasks tested have a task percentage of 100%. Remaining 4 tasks have a success percentage of 87.5%. However, for the tasks having less than 100% success rates, the users that encountered difficulty was with tasks that were outside of their routine practice and daily job functions.

4.2.2 EFFICIENCY

Considering the data collected for the tasks indicate a high level of efficiency in the system. Very few path deviations were observed during the usability test just because the user followed the path with which he/she was comfortable to meet the needs rather than following the optimal path.

4.2.3 SATISFACTION

Overall, the system received excellent scores that indicate a high level of user satisfaction. On the scale of 1 (Very Difficult) to 5 (Very Easy), the range of satisfaction scores recorded is from 3 to 5. Out of 39 tasks, only few tasks scored the rating less than 4.

4.2.4 MAJOR FINDINGS

Overall all the tasks were found very much user-friendly. Users were comfortable performing the tasks and they were found satisfied with their experience with the system and their ability to complete the tasks. The new layout was very much appreciated by some of the participants. For some participants, medication module needed some level of guidance, however, once cleared their doubts, it became easier for the participants to perform the tasks related for this module.

4.2.5 AREAS FOR IMPROVEMENT

Considering the overall feedback from the participants, the workflows were very easy to perform. The users were quite comfortable to perform the tasks that were given to them. Overall layout and smart search features were very much useful for the participants; however, few cosmetic changes were suggested that can be taken care of while designing the new features in future.



5. USER CENTERED DESIGN – METHOD AND IMPLEMENTATION

5.1 OVERVIEW

InSync has been following a non-industry standard User Centered Design process during EHR development. This process closely matches with the NISTIR 7741 standard. This demonstrates how our internal process is aligned with the principles summarized in NISTIR 7741. This process is utilized throughout our EHR development for all criteria/feature sets.

5.2 ABOUT USER CENTERED DESIGN (UCD)

UCD (User Centered Design) process focuses on the end users of the software product and considers their involvement in the design and development of the new software. It needs an understanding of the customers and the environment where they will actually be using the product. Clear understanding of the customers' (users') needs and their workflow ensure more accuracy in user requirements, which eventually leads to the development of more usable systems. UCD is an iterative process that involves design and testing of the product at each stage. The principles outlined by the NIST (the National Institute of Standards and Technology) resembles in our organizations internal UCD process. The activities involved, understanding the context of use, specifying user requirements, designing multiple iteration of sketches, Evaluate the design and review it post deployment. At each stage the requirements are reviewed and made necessary changes at times when required.

5.2.1 UNDERSTAND USER NEEDS, WORKFLOW, AND WORK ENVIRONMENTS

Process of designing new feature or module begins by understanding the purpose of the new software. How the new features will fulfill the users' requirements is identified to create the best suitable design. The information is collected by initiating meetings various stakeholders, creating use cases and user goals while working with customers/end users. Client interaction can be encouraged to observe current workflow in the environment where the features will be used, to further aid the design process.

5.3 ENGAGE USERS EARLY AND OFTEN

Customers / end users are involved in various phases of the development lifecycle. The following techniques may be employed throughout a project:

Focus Groups – Created groups of end users representing several customer organizations. The purpose of groups is to provide consistent qualitative input on our product design throughout the development cycle.

High and Low Fidelity Prototypes – Prototypes allows design staff members to test various aspects of the design. A low fidelity prototype may be used as a proof of concept during early design process. At a later stage, high fidelity interactive prototypes can be used to evaluate the look and feel, navigation, and workflow with end users before finalizing the design or start of code development.

Input from Subject Matter Expert (SME) – For certain projects, a contracted or employed SME (Physician Advisor or an Expert User Champion from a customer organization) may participate to share the end user's needs during the development process.



Feedback –Feedback can take place as an efficient method to gather valuable inputs from a high numerous users.

Usability Testing – Usability testing evaluates the effectiveness, efficiency, and satisfaction of a design by requesting end users representative to use a prototype or actual software to perform simulated but realistic tasks. Several quantitative measures are gathered such as success rates, task completion time, path deviations, and number of clicks as well as general comments.

Interaction with End Users – User interviews can be used to obtain input from end users for a variety of purposes. Requirement gathering interviews help to understand use cases, user goals, and expected workflows.

User Roles – Various user roles in the industry are outlined for better understanding of target audience who would be using the released features, what are their goals, responsibilities, and background and so forth.

5.4 SET USER PERFORMANCE OBJECTIVES

Objective measures of success play a vital role in deciding when the design has reached its goal of usability. User performance objectives can be set to effectiveness, efficiency, and satisfaction.

- Effectiveness (ability to complete tasks successfully)
- Efficiency (speed to complete the task)
- Satisfaction (Ease of using a feature to complete a task)

Usability testing can be performed to measure the above objectives. Before releasing the feature set to the customers, it is to be assured that the satisfactory test results are achieved.

5.5 DESIGNING THE USER INTERFACE

In order to provide the best user experience, design staff is trained on the basic usability principles and product design standards. Numerous reference materials support the design team during designing the new feature. Once the requirement specification document is complete, it is reviewed by the stakeholders to ensure that it adhere the usability principles and design standards.

5.6 TESTING AND EVALUATION

During the development process, multiple iterations take place for testing and evaluating the new feature sets. In early phase of design, the sketches/prototypes may be shared with stakeholders/end users to ensure the design is progressing as expected. Based on feedback, design team modifies the prototypes. Once the coding is complete, the software it completely tested to ensure that it meets the specified requirements as defined in early phase. Validation testing is carried out to ensure internal exit criterion has been met. End



users representatives perform usability testing. These types of testing ensure that the software meets the user goals and designed as stated in the project during initiation phase.

5.6.1 TESTING LOCATION

The InSync software solution is delivered as a service over the internet, with our production servers located at a co-location facility located in Tempa, FL. For convenience, this facility is located less than 5 miles away from our operations offices, also located in Tempa, FL.

During conduct of evaluation and certification testing, the primary moderator for the testing is located at our office location in Tempa, with a backup/secondary moderator located at our offshore development facility located in Vadodara, Gujarat, India.

InSync is currently accessed by medical practices located in 49 out of the 50 states within the U.S., including Alaska and Hawaii. Customers/End Users who participate in the testing are located at various medical practices located primarily in the states of New York and New Jersey, as well as Connecticut, California, and Hawaii.



6. APPENDICES

6.1 Appendix A: Proctor Sheets

Task 1: Record Medication Order (30 Seconds)

Take the participant to the starting point for the task.

After examining *Patient*, you have decided to order a Medication (Paracetamol).

Success:

- Easily completed
- Completed with difficulty or help (Describe below)
- Not completed

Comments:

Task Time: _____ Seconds

Optimal Path:

1. On top left smart search box, type in "Medications/Allergies".
2. Select the "Medications/Allergies in Charting" option.
3. On the Patient Search screen, select patient.
4. On Facesheet, expand Medications section.
5. Click the Prescribe/Manage button.
6. Type "Paracetamol" in the medication name and select medication from the list.
7. Record other necessary details such as dose, unit, rout, frequency, days-supply, quantity, refill, and so forth.
8. Enter any notes that you want to send to pharmacy.
9. Click Save. The medication is added to the grid.
10. Click Next to access the Medications Review screen.
11. Select a pharmacy from the list.
12. Click the Review & Transmit Rx button.

Actual Path:

- Correct
- Minor Deviations / Cycles (Describe below)
- Major Deviations (Describe below)

Comments:

Observed Errors and Verbalizations:

Comments:

Rating:



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Overall, this task was: _____

Show participant written scale: *“Very Difficult” (1) to “Very Easy” (5)*

Administrator / Note taker Comments:



Task 2: Change Medication Order (40 Seconds)

Take the participant to the starting point for the task.

After ordering Paracetamol, you decided to change the medication to “isoniazid”.

Success:

- Easily completed
- Completed with difficulty or help (Describe below)
- Not completed

Comments:

Task Time: _____ Seconds

Optimal Path:

1. On top left smart search box, type in “Medications/Allergies”.
2. Select the “Medications/Allergies in Charting” option.
3. On the Patient Search screen, select patient.
4. On Facesheet, expand Medications section.
5. Click the Prescribe/Manage button.
6. Type “isoniazid” in the medication name and select medication from the list.
7. Record other necessary details such as dose, unit, rout, frequency, days-supply, quantity, refill, and so forth.
8. Enter any notes that you want to send to pharmacy.
9. Click Save. The medication is added to the grid.
10. Click Next to access the Medications Review screen.
11. Select a pharmacy from the list.
12. Click the Review & Transmit Rx button.
13. On the Prescribe Medication screen, click the Manage tab.
14. In the Current Medications section, click the Cancel Rx button for “Paracetamol”.

Actual Path:

- Correct
- Minor Deviations / Cycles (Describe below)
- Major Deviations (Describe below)

Comments:

Observed Errors and Verbalizations:

Comments:



Rating:

Overall, this task was: _____

Show participant written scale: "Very Difficult" (1) to "Very Easy" (5)

Administrator / Note taker Comments:



Task 3: Access Medication Order (10 Seconds)

Take the participant to the starting point for the task.

As part of our job responsibilities, you may want to access a medication order.

Success:

- Easily completed
- Completed with difficulty or help (Describe below)
- Not completed

Comments:

Task Time: _____ Seconds

Optimal Path:

1. On top left smart search box, type in “Medications/Allergies”.
2. Select the “Medications/Allergies in Charting” option.
3. On the Patient Search screen, select patient.
4. On Facesheet, expand Medications section to review the medications.

Actual Path:

- Correct
- Minor Deviations / Cycles (Describe below)
- Major Deviations (Describe below)

Comments:

Observed Errors and Verbalizations:

Comments:

Rating:

Overall, this task was: _____

Show participant written scale: “Very Difficult” (1) to “Very Easy” (5)

Administrator / Note taker Comments:



Task 4: Record Laboratory Order (20 Seconds)

Take the participant to the starting point for the task.

After examining *Patient*, you have decided to order a Laboratory test.

Success:

- Easily completed
- Completed with difficulty or help (Describe below)
- Not completed

Comments:

Task Time: _____ Seconds

Optimal Path:

1. From the left pane, click the Facesheet icon.
2. On the Patient Search screen, select patient.
3. On Facesheet, expand Pending Services section.
4. Click Order Labs button
5. Select Laboratory
6. Select Ordering Provider
7. Type "hemoglobin" in Test field
8. Select "Hemoglobin A1c – 001453" from the list
9. Click Save button

Actual Path:

- Correct
- Minor Deviations / Cycles (Describe below)
- Major Deviations (Describe below)

Comments:

Observed Errors and Verbalizations:

Comments:

Rating:

Overall, this task was: _____

Show participant written scale: "Very Difficult" (1) to "Very Easy" (5)

Administrator / Note taker Comments:



Task 5: Change Laboratory Order (20 Seconds)

Take the participant to the starting point for the task.

You may want to update the lab order details later on.

Success:

- Easily completed
- Completed with difficulty or help (Describe below)
- Not completed

Comments:

Task Time: _____ Seconds

Optimal Path:

1. From the left pane, click the Facesheet icon.
2. On the Patient Search screen, select patient.
3. On Facesheet, expand Pending Services section.
4. Click Order Labs button
5. Select Laboratory
6. Click Edit icon for any unprocessed order
7. Change the diet to Regular
8. Click Place Order button

Actual Path:

- Correct
- Minor Deviations / Cycles (Describe below)
- Major Deviations (Describe below)

Comments:

Observed Errors and Verbalizations:

Comments:

Rating:

Overall, this task was: _____

Show participant written scale: "Very Difficult" (1) to "Very Easy" (5)

Administrator / Note taker Comments:



Task 6: Access Laboratory Order (10 Seconds)

Take the participant to the starting point for the task.

As part of our job responsibilities, you may want to access a lab order.

Success:

- Easily completed
- Completed with difficulty or help (Describe below)
- Not completed

Comments:

Task Time: _____ Seconds

Optimal Path:

1. From the left pane, click the Facesheet icon.
2. On the Patient Search screen, select patient.
3. On Facesheet, expand Pending Services section to review placed orders.

Actual Path:

- Correct
- Minor Deviations / Cycles (Describe below)
- Major Deviations (Describe below)

Comments:

Observed Errors and Verbalizations:

Comments:

Rating:

Overall, this task was: _____

Show participant written scale: "Very Difficult" (1) to "Very Easy" (5)

Administrator / Note taker Comments:



Task 7: Record Radiology/Imaging Order (20 Seconds)

Take the participant to the starting point for the task.

After examining *Patient*, you have decided to order a chest x-ray.

Success:

- Easily completed
- Completed with difficulty or help (Describe below)
- Not completed

Comments:

Task Time: _____ Seconds

Optimal Path:

1. From the left pane, click the Facesheet icon.
2. On the Patient Search screen, select patient.
3. Start a new encounter or edit an in-progress encounter.
4. From the links shown on the top, click Treatment Plan.
5. In the Radiology section, select check boxes for ordering radiology tests.

Actual Path:

- Correct
- Minor Deviations / Cycles (Describe below)
- Major Deviations (Describe below)

Comments:

Observed Errors and Verbalizations:

Comments:

Rating:

Overall, this task was: _____

Show participant written scale: "Very Difficult" (1) to "Very Easy" (5)

Administrator / Note taker Comments:



Task 8: Change Radiology/Imaging Order (20 Seconds)

Take the participant to the starting point for the task.

After ordering the x-ray, you may want to change the urgency to STAT.

Success:

- Easily completed
- Completed with difficulty or help (Describe below)
- Not completed

Comments:

Task Time: _____ Seconds

Optimal Path:

1. From the left pane, click the Facesheet icon.
2. On the Patient Search screen, select patient.
3. Start a new encounter or edit an in-progress encounter.
4. From the links shown on the top, click Treatment Plan.
5. In the Radiology section, select check boxes for ordering radiology tests and clear the check boxes for the radiology tests those are already ordered.

Actual Path:

- Correct
- Minor Deviations / Cycles (Describe below)
- Major Deviations (Describe below)

Comments:

Observed Errors and Verbalizations:

Comments:

Rating:

Overall, this task was: _____

Show participant written scale: "Very Difficult" (1) to "Very Easy" (5)

Administrator / Note taker Comments:



Task 9: Access Radiology/Imaging Order (15 Seconds)

Take the participant to the starting point for the task.

As part of our job responsibilities, you may want to access radiology orders.

Success:

- Easily completed
- Completed with difficulty or help (Describe below)
- Not completed

Comments:

Optimal Path:

1. From the left pane, click the Facesheet icon.
2. On the Patient Search screen, select patient.
3. Start a new encounter or edit an in-progress encounter.
4. From the links shown on the top, click Treatment Plan.
5. Expand the Radiology section.

Actual Path:

Task Time: _____ Seconds

- Correct
- Minor Deviations / Cycles (Describe below)
- Major Deviations (Describe below)

Comments:

Observed Errors and Verbalizations:

Comments:

Rating:

Overall, this task was: _____

Show participant written scale: "Very Difficult" (1) to "Very Easy" (5)

Administrator / Note taker Comments:



Task 10: Interact with drug-drug and drug-allergy interventions prior Medication Order completion (40 Seconds)

Take the participant to the starting point for the task.

You want to order an electronic prescription, but before that, want to check drug-allergy interventions prior to completing the CPOE.

Success:

- Easily completed
- Completed with difficulty or help (Describe below)
- Not completed

Comments:

Task Time: _____ Seconds

Optimal Path:

Note: Make sure “Rifadin” is ordered prior to performing following steps:

1. From the left pane, click the Facesheet icon.
2. On the Patient Search screen, select patient.
3. On Facesheet, expand Medications section.
4. Click Prescribe/Manage button
5. Type “isoniazid” in the medication name and select medication from the list.
6. Record other necessary details such as dose, unit, rout, frequency, days-supply, quantity, refill, and so forth.
7. Enter any notes that you want to send to pharmacy.
8. Click Save. The medication is added to the grid.
9. Click Next to access the Medications Review screen for interactions.

Actual Path:

- Correct
- Minor Deviations / Cycles (Describe below)
- Major Deviations (Describe below)

Comments:

Observed Errors and Verbalizations:

Comments:

Rating:

Overall, this task was: _____

Show participant written scale: “Very Difficult” (1) to “Very Easy” (5)



Administrator / Note taker Comments:

Task 11: Adjustment of severity level of drug-drug interventions (35 Seconds)

Take the participant to the starting point for the task.

You are a system admin and you want to adjust the severity level of drug-drug interactions.

Success:

- Easily completed
- Completed with difficulty or help (Describe below)
- Not completed

Comments:

Task Time: _____ Seconds

Optimal Path:

1. From the left pane, click the Facesheet icon.
2. On the Patient Search screen, select patient.
3. On Facesheet, expand Medications section.
4. Click Prescribe/Manage button
5. Click the Admin Configuration icon from top right corner
6. Expand the Provider Configuration panel.
7. Select/Deselect “Hide All Less Severe Drug Interactions (Show Only Contraindicated)” check box
8. Click Save.

Actual Path:

- Correct
- Minor Deviations / Cycles (Describe below)
- Major Deviations (Describe below)

Comments:

Observed Errors and Verbalizations:

Comments:

Rating:

Overall, this task was: _____

Show participant written scale: “Very Difficult” (1) to “Very Easy” (5)

Administrator / Note taker Comments:



Task 12: Record Medication List (35 Seconds)

Take the participant to the starting point for the task.

You are checking a patient in and you want to record the patient's list of current medications.

Success:

- Easily completed
- Completed with difficulty or help (Describe below)
- Not completed

Comments:

Task Time: _____ Seconds

Optimal Path:

1. From the left pane, click the Facesheet icon.
2. On the Patient Search screen, select patient.
3. On Facesheet, expand Medications section.
4. Click Prescribe/Manage button
5. On the Prescribe Medication screen, click the Manage tab.
6. Type "penicillamine" in the medication name and select medication from the list.
7. Click Add. Medication will be added to current medications list.

Actual Path:

- Correct
- Minor Deviations / Cycles (Describe below)
- Major Deviations (Describe below)

Comments:

Observed Errors and Verbalizations:

Comments:

Rating:

Overall, this task was: _____

Show participant written scale: "Very Difficult" (1) to "Very Easy" (5)

Administrator / Note taker Comments:



Task 13: Change Medication List (35 Seconds)

Take the participant to the starting point for the task.

You are checking in an existing patient and need to update medications list.

Success:

- Easily completed
- Completed with difficulty or help (Describe below)
- Not completed

Comments:

Task Time: _____ Seconds

Optimal Path:

1. From the left pane, click the Facesheet icon.
2. On the Patient Search screen, select patient.
3. On Facesheet, expand Medications section.
4. Click Prescribe/Manage button
5. On the Prescribe Medication screen, click the Manage tab.
6. Click the Edit icon next to medication name.
7. Change Sig details and click Update.

Actual Path:

- Correct
- Minor Deviations / Cycles (Describe below)
- Major Deviations (Describe below)

Comments:

Observed Errors and Verbalizations:

Comments:

Rating:

Overall, this task was: _____

Show participant written scale: "Very Difficult" (1) to "Very Easy" (5)

Administrator / Note taker Comments:



Task 14: Access Medication List (10 Seconds)

Take the participant to the starting point for the task.

You are preparing to examine a patient and want to check to see what medications they are currently taking.

Success:

- Easily completed
- Completed with difficulty or help (Describe below)
- Not completed

Comments:

Task Time: _____ Seconds

Optimal Path:

1. On top left smart search box, type in "Medications/Allergies".
2. Select the "Medications/Allergies in Charting" option.
3. On the Patient Search screen, select patient.
4. On Facesheet, expand Medications section to review the medications.

Actual Path:

- Correct
- Minor Deviations / Cycles (Describe below)
- Major Deviations (Describe below)

Comments:

Observed Errors and Verbalizations:

Comments:

Rating:

Overall, this task was: _____

Show participant written scale: "Very Difficult" (1) to "Very Easy" (5)

Administrator / Note taker Comments:



Task 15: Record Allergy List (25 Seconds)

Take the participant to the starting point for the task.

You are checking a patient in and you want to record the patient's list of allergies.

Success:

- Easily completed
- Completed with difficulty or help (Describe below)
- Not completed

Comments:

Task Time: _____ Seconds

Optimal Path:

1. On top left smart search box, type in "Medications/Allergies".
2. Select the "Medications/Allergies in Charting" option.
3. On the Patient Search screen, select patient.
4. On Facesheet, expand Medications section.
5. Click the Prescribe/Manage button.
6. In the Allergy section, click the Plus icon.
7. Type in allergy name and a list of allergies will appear. Select an allergen and click Add. Allergen will be added to the following grid.

Actual Path:

- Correct
- Minor Deviations / Cycles (Describe below)
- Major Deviations (Describe below)

Comments:

Observed Errors and Verbalizations:

Comments:

Rating:

Overall, this task was: _____

Show participant written scale: "Very Difficult" (1) to "Very Easy" (5)

Administrator / Note taker Comments:



Task 16: Change Allergy List (25 Seconds)

Take the participant to the starting point for the task.

You are checking in an existing patient and need to change allergy details.

Success:

- Easily completed
- Completed with difficulty or help (Describe below)
- Not completed

Comments:

Task Time: _____ Seconds

Optimal Path:

1. On top left smart search box, type in “Medications/Allergies”.
2. Select the “Medications/Allergies in Charting” option.
3. On the Patient Search screen, select patient.
4. On Facesheet, expand Medications section.
5. Click the Prescribe/Manage button.
6. In the Allergy section, click the Plus icon.
7. Click the Edit icon next to allergen name.
8. Update the allergen details such as Severity, Type, Reaction, and so forth, and click Update.

Actual Path:

- Correct
- Minor Deviations / Cycles (Describe below)
- Major Deviations (Describe below)

Comments:

Observed Errors and Verbalizations:

Comments:

Rating:

Overall, this task was: _____

Show participant written scale: “Very Difficult” (1) to “Very Easy” (5)

Administrator / Note taker Comments:



Task 17: Access Allergy List (10 Seconds)

Take the participant to the starting point for the task.

You are preparing to examine a patient and want to check to see what allergy they are currently taking.

Success:

- Easily completed
- Completed with difficulty or help (Describe below)
- Not completed

Comments:

Task Time: _____ Seconds

Optimal Path:

1. On top left smart search box, type in "Medications/Allergies".
2. Select the "Medications/Allergies in Charting" option.
3. On the Patient Search screen, select patient.
4. On Facesheet, expand Medications section.
5. Click the Prescribe/Manage button.
6. In Allergies section, review recorded allergies

Actual Path:

- Correct
- Minor Deviations / Cycles (Describe below)
- Major Deviations (Describe below)

Comments:

Observed Errors and Verbalizations:

Comments:

Rating:

Overall, this task was: _____

Show participant written scale: "Very Difficult" (1) to "Very Easy" (5)

Administrator / Note taker Comments:



Task 18: Electronic Prescribing (30 Seconds)

Take the participant to the starting point for the task.

You want to electronically prescribe a medication.

Success:

- Easily completed
- Completed with difficulty or help (Describe below)
- Not completed

Comments:

Task Time: _____ Seconds

Optimal Path:

1. On top left smart search box, type in “Medications/Allergies”.
2. Select the “Medications/Allergies in Charting” option.
3. On the Patient Search screen, select patient.
4. On Facesheet, expand Medications section.
5. Click the Prescribe/Manage button.
6. Type “Paracetamol” in the medication name and select medication from the list.
7. Record other necessary details such as dose, unit, rout, frequency, days-supply, quantity, refill, and so forth.
8. Enter any notes that you want to send to pharmacy.
9. Click Save. The medication is added to the grid.
10. Click Next to access the Medications Review screen.
11. Select a pharmacy from the list.
12. Click the Review & Transmit Rx button.

Actual Path:

- Correct
- Minor Deviations / Cycles (Describe below)
- Major Deviations (Describe below)

Comments:

Observed Errors and Verbalizations:

Comments:

Rating: Overall, this task was: _____

Show participant written scale: “Very Difficult” (1) to “Very Easy” (5)

Administrator / Note taker Comments:



Task 19-A: Configuration of CDS interventions (for medication list) by user (20 Seconds)

Take the participant to the starting point for the task.

You want to configure Clinical Decision Support Intervention for specific medication.

Success:

- Easily completed
- Completed with difficulty or help (Describe below)
- Not completed

Comments:

Task Time: _____ Seconds

Optimal Path:

1. On top left smart search box, type in “Clinical Decision Support Intervention”
2. Type intervention name in Intervention field, e.g. “Medication Alert”
3. In “Users associated to the intervention” field, select user(s) from the drop-down list to whom the alert should be prompted
4. In Medication section, type “Paracetamol 500 mg tablet”, and click Add.
5. Click Save button

Actual Path:

- Correct
- Minor Deviations / Cycles (Describe below)
- Major Deviations (Describe below)

Comments:

Observed Errors and Verbalizations:

Comments:

Rating:

Overall, this task was: _____

Show participant written scale: “Very Difficult” (1) to “Very Easy” (5)

Administrator / Note taker Comments:



Task 19-B: Medication List Interventions (40 Seconds)

Take the participant to the starting point for the task.

You want to generate an alert to the user while prescribing specific medication.

Success:

- Easily completed
- Completed with difficulty or help (Describe below)
- Not completed

Comments:

Task Time: _____ Seconds

Optimal Path:

1. On top left smart search box, type in “Medications/Allergies”.
2. Select the “Medications/Allergies in Charting” option.
3. On the Patient Search screen, select patient.
4. On Facesheet, expand Medications section.
5. Click the Prescribe/Manage button.
6. Type “Paracetamol 500 mg tablet” in the medication name and select medication from the list.
7. Record other necessary details such as dose, unit, rout, frequency, days-supply, quantity, refill, and so forth.
8. Enter any notes that you want to send to pharmacy.
9. Click Save. The medication is added to the grid.
10. Click Next to access the Medications Review screen.
11. Select a pharmacy from the list.
12. Click the Review & Transmit Rx button. The alert pops up.

Actual Path:

- Correct
- Minor Deviations / Cycles (Describe below)
- Major Deviations (Describe below)

Comments:

Observed Errors and Verbalizations:

Comments:

Rating: Overall, this task was: _____

Show participant written scale: “Very Difficult” (1) to “Very Easy” (5)



Administrator / Note taker Comments:

**Task 20-A: Configuration of CDS interventions (for medication allergy list) by user
(20 Seconds)**

Take the participant to the starting point for the task.

You want to configure Clinical Decision Support Intervention for specific medication allergy.

Success:

- Easily completed
- Completed with difficulty or help (Describe below)
- Not completed

Comments:

Task Time: _____ Seconds

Optimal Path:

1. On top left smart search box, type in “Clinical Decision Support Intervention”
2. Type intervention name in Intervention field, e.g. “Allergy Alert”
3. In “Users associated to the intervention” field, select user(s) from the drop-down list to whom the alert should be prompted
4. In Allergy section, type “Gluten”, and click Add.
5. Click Save button

Actual Path:

- Correct
- Minor Deviations / Cycles (Describe below)
- Major Deviations (Describe below)

Comments:

Observed Errors and Verbalizations:

Comments:

Rating: Overall, this task was: _____

Show participant written scale: “Very Difficult” (1) to “Very Easy” (5)

Administrator / Note taker Comments:



Task 20-B: Medication Allergy List Interventions (25 Seconds)

Take the participant to the starting point for the task.

You want to generate an alert to the user while recording specific allergy.

Success:

- Easily completed
- Completed with difficulty or help (Describe below)
- Not completed

Comments:

Task Time: _____ Seconds

Optimal Path:

1. On top left smart search box, type in “Medications/Allergies”.
2. Select the “Medications/Allergies in Charting” option.
3. On the Patient Search screen, select patient.
4. On Facesheet, expand Medications section.
5. Click the Prescribe/Manage button.
6. In the Allergy section, click the Plus icon.
7. Type in allergy name and a list of allergies will appear. Select an allergen “Gluten” and click Add. The alert pops up.

Actual Path:

- Correct
- Minor Deviations / Cycles (Describe below)
- Major Deviations (Describe below)

Comments:

Observed Errors and Verbalizations:

Comments:

Rating:

Overall, this task was: _____

Show participant written scale: “Very Difficult” (1) to “Very Easy” (5)

Administrator / Note taker Comments:



Task 21-A: Configuration of CDS interventions (for problem list) by user (30 Seconds)

Take the participant to the starting point for the task.

You want to configure Clinical Decision Support Intervention for specific problem.

Success:

- Easily completed
- Completed with difficulty or help (Describe below)
- Not completed

Comments:

Task Time: _____ Seconds

Optimal Path:

1. On top left smart search box, type in “Clinical Decision Support Intervention”
2. Type intervention name in Intervention field, e.g. “Problem List Alert”
3. In “Users associated to the intervention” field, select user(s) from the drop-down list to whom the alert should be prompted
4. In Diagnosis Codes section, type “Headache”, and click Add.
5. Click Save button

Actual Path:

- Correct
- Minor Deviations / Cycles (Describe below)
- Major Deviations (Describe below)

Comments:

Observed Errors and Verbalizations:

Comments:

Rating: Overall, this task was: _____

Show participant written scale: “Very Difficult” (1) to “Very Easy” (5)

Administrator / Note taker Comments:



Task 21-B: Problem List Interventions (40 Seconds)

Take the participant to the starting point for the task.

You want to generate an alert to the user while recording specific problem.

Success:

- Easily completed
- Completed with difficulty or help (Describe below)
- Not completed

Comments:

Task Time: _____ Seconds

Optimal Path:

1. On the top menu bar, click Facesheet
2. Select patient from the list
3. Start a new encounter or edit in-progress encounter
4. Click Problem List link
5. In Illness field, type the problem name for which alert is setup, for example, "Headache"
6. Click Save. The alert pops up.

Actual Path:

- Correct
- Minor Deviations / Cycles (Describe below)
- Major Deviations (Describe below)

Comments:

Observed Errors and Verbalizations:

Comments:

Rating:

Overall, this task was: _____

Show participant written scale: "Very Difficult" (1) to "Very Easy" (5)

Administrator / Note taker Comments:



Task 22-A: Configuration of CDS interventions (for demographics) by user (20 Seconds)

Take the participant to the starting point for the task.

You want to configure Clinical Decision Support Intervention for specific demographic details.

Success:

- Easily completed
- Completed with difficulty or help (Describe below)
- Not completed

Comments:

Task Time: _____ Seconds

Optimal Path:

1. On top left smart search box, type in “Clinical Decision Support Intervention”
2. Type intervention name in Intervention field, e.g. “Demographics Alert”
3. In “Users associated to the intervention” field, select user(s) from the drop-down list to whom the alert should be prompted
4. Select Age > 100 years
5. Click Save button

Actual Path:

- Correct
- Minor Deviations / Cycles (Describe below)
- Major Deviations (Describe below)

Comments:

Observed Errors and Verbalizations:

Comments:

Rating:

Overall, this task was: _____

Show participant written scale: “Very Difficult” (1) to “Very Easy” (5)

Administrator / Note taker Comments:



Task 22-B: Demographics Interventions (15 Seconds)

Take the participant to the starting point for the task.

You want to generate an alert to the user while recording specific demographic detail.

Success:

- Easily completed
- Completed with difficulty or help (Describe below)
- Not completed

Comments:

Task Time: _____ Seconds

Optimal Path:

1. From left menu, click Patient Search icon.
2. Edit any existing patient.
3. Change DOB to make the patient more than 100 years.
4. Click Save. The alert pops up.

Actual Path:

- Correct
- Minor Deviations / Cycles (Describe below)
- Major Deviations (Describe below)

Comments:

Observed Errors and Verbalizations:

Comments:

Rating:

Overall, this task was: _____

Show participant written scale: "Very Difficult" (1) to "Very Easy" (5)

Administrator / Note taker Comments:



Task 23-A: Configuration of CDS interventions (for lab test) by user (20 Seconds)

Take the participant to the starting point for the task.

You want to configure Clinical Decision Support Intervention that will pop up when ordering specific lab test.

Success:

- Easily completed
- Completed with difficulty or help (Describe below)
- Not completed

Comments:

Task Time: _____ Seconds

Optimal Path:

1. On top left smart search box, type in “Clinical Decision Support Intervention”
2. Type intervention name in Intervention field, e.g. “Lab Test Alert”
3. In “Users associated to the intervention” field, select user(s) from the drop-down list to whom the alert should be prompted
4. In Lab Test (Ordered) section, type test name, for example, “CBC”, “Lipid Panel”, and click Add.
5. Click Save button

Actual Path:

- Correct
- Minor Deviations / Cycles (Describe below)
- Major Deviations (Describe below)

Comments:

Observed Errors and Verbalizations:

Comments:

Rating:

Overall, this task was: _____

Show participant written scale: “Very Difficult” (1) to “Very Easy” (5)

Administrator / Note taker Comments:



Task 23-B: Lab Test Interventions (25 Seconds)

Take the participant to the starting point for the task.

You want to generate an alert to the user while ordering specific test.

Success:

- Easily completed
- Completed with difficulty or help (Describe below)
- Not completed

Comments:

Task Time: _____ Seconds

Optimal Path:

1. From the left pane, click the Facesheet icon.
2. On the Patient Search screen, select patient.
3. On Facesheet, expand Pending Services section.
4. Click Order Labs button
5. Select Laboratory
6. In the Test field, type the test name for which alert is configured, e.g., CBC, Lipid Panel. The alert pops up.

Actual Path:

- Correct
- Minor Deviations / Cycles (Describe below)
- Major Deviations (Describe below)

Comments:

Observed Errors and Verbalizations:

Comments:

Rating:

Overall, this task was: _____

Show participant written scale: "Very Difficult" (1) to "Very Easy" (5)

Administrator / Note taker Comments:



Task 24-A: Configuration of CDS interventions (for lab result) by user (20 Seconds)

Take the participant to the starting point for the task.

You want to configure Clinical Decision Support Intervention while recording specific lab result.

Success:

- Easily completed
- Completed with difficulty or help (Describe below)
- Not completed

Comments:

Task Time: _____ Seconds

Optimal Path:

1. On top left smart search box, type in “Clinical Decision Support Intervention”
2. Type intervention name in Intervention field, e.g. “Lab Result Alert”
3. In “Users associated to the intervention” field, select user(s) from the drop-down list to whom the alert should be prompted
4. In Lab Result section, select the parameter, for example, “Dengue Fever”
5. Define the lab result range along with unit and click Add
6. Click Save button

Actual Path:

- Correct
- Minor Deviations / Cycles (Describe below)
- Major Deviations (Describe below)

Comments:

Observed Errors and Verbalizations:

Comments:

Rating:

Overall, this task was: _____

Show participant written scale: “Very Difficult” (1) to “Very Easy” (5)

Administrator / Note taker Comments:



Task 24-B: Lab Result Interventions (25 Seconds)

Take the participant to the starting point for the task.

You want to generate an alert to the user while recording specific result.

Success:

- Easily completed
- Completed with difficulty or help (Describe below)
- Not completed

Comments:

Task Time: _____ Seconds

Optimal Path:

1. From the left pane, click the Facesheet icon.
2. On the Patient Search screen, select patient.
3. On Facesheet, expand Pending Services section.
4. Click Add Result link.
5. In the Observation Identifier field, type the parameter (e.g., Dengue Fever) and enter values within the configured range.
6. Click Add. The alert pops up.

Actual Path:

- Correct
- Minor Deviations / Cycles (Describe below)
- Major Deviations (Describe below)

Comments:

Observed Errors and Verbalizations:

Comments:

Rating:

Overall, this task was: _____

Show participant written scale: "Very Difficult" (1) to "Very Easy" (5)

Administrator / Note taker Comments:



Task 25-A: Configuration of CDS interventions (for vital signs) by user (20 Seconds)

Take the participant to the starting point for the task.

You want to configure Clinical Decision Support Intervention for specific vital sign.

Success:

- Easily completed
- Completed with difficulty or help (Describe below)
- Not completed

Comments:

Task Time: _____ Seconds

Optimal Path:

1. On top left smart search box, type in “Clinical Decision Support Intervention”
2. Type intervention name in Intervention field, e.g. “Vital Sign Alert”
3. In “Users associated to the intervention” field, select user(s) from the drop-down list to whom the alert should be prompted
4. In Vitals section, select “Weight (Kgs)” from drop-down list with value 200, and click Add.
5. Click Save button

Actual Path:

- Correct
- Minor Deviations / Cycles (Describe below)
- Major Deviations (Describe below)

Comments:

Observed Errors and Verbalizations:

Comments:

Rating: Overall, this task was: _____

Show participant written scale: “Very Difficult” (1) to “Very Easy” (5)

Administrator / Note taker Comments:



Task 25-B: Vital Signs Interventions (40 Seconds)

Take the participant to the starting point for the task.

You want to generate an alert to the user while recording specific vital sign.

Success:

- Easily completed
- Completed with difficulty or help (Describe below)
- Not completed

Comments:

Task Time: _____ Seconds

Optimal Path:

1. From the left pane, click the Facesheet icon.
2. On the Patient Search screen, select patient.
3. Start a new encounter or edit an in-progress encounter.
4. From the links shown on the top, click Vitals.
5. In the Weight field, select the parameter for which you have configured alert, for example, "200 kgs. Weight"
6. Click Save. The alert pops up.

Actual Path:

- Correct
- Minor Deviations / Cycles (Describe below)
- Major Deviations (Describe below)

Comments:

Observed Errors and Verbalizations:

Comments:

Rating:

Overall, this task was: _____

Show participant written scale: "Very Difficult" (1) to "Very Easy" (5)

Administrator / Note taker Comments:



Task 26-A: Configuration of CDS interventions (for User Diagnostic and Therapeutic Reference) by user (20 Seconds)

Take the participant to the starting point for the task.

You want to configure Clinical Decision Support Intervention for user diagnostic and therapeutic reference.

Success:

- Easily completed
- Completed with difficulty or help (Describe below)
- Not completed

Comments:

Task Time: _____ Seconds

Optimal Path:

1. On top left smart search box, type in "Clinical Decision Support Intervention"
2. Type intervention name in Intervention field, for example, "Vital Sign Alert"
3. Click Browse to attach a file.
4. Type reference link in the Reference Links field.
5. Click Attach button
6. Click Close

Actual Path:

- Correct
- Minor Deviations / Cycles (Describe below)
- Major Deviations (Describe below)

Comments:

Observed Errors and Verbalizations:

Comments:

Rating: Overall, this task was: _____

Show participant written scale: "Very Difficult" (1) to "Very Easy" (5)

Administrator / Note taker Comments:



Task 26-B: Identify User Diagnostic and Therapeutic Reference Information (40 Seconds)

Take the participant to the starting point for the task.

You want to view the diagnostic and therapeutic reference information when the alert pops up.

Success:

- Easily completed
- Completed with difficulty or help (Describe below)
- Not completed

Comments:

Task Time: _____ Seconds

Optimal Path:

1. From the left pane, click the Facesheet icon.
2. On the Patient Search screen, select patient.
3. Start a new encounter or edit an in-progress encounter.
4. From the links shown on the top, click Vitals.
5. Select the parameter for which you have setup an alert, for example, click Vitals link
6. In the Weight field, select the parameter for which you have configured alert, for example, "200 kgs. Weight"
7. Click Save. The alert pops up with diagnostic and therapeutic reference information.

Actual Path:

- Correct
- Minor Deviations / Cycles (Describe below)
- Major Deviations (Describe below)

Comments:

Observed Errors and Verbalizations:

Comments:

Rating: Overall, this task was: _____

Show participant written scale: "Very Difficult" (1) to "Very Easy" (5)

Administrator / Note taker Comments:



Task 27: Reconcile patient’s active medication list with another source (50 Seconds)

Take the participant to the starting point for the task.

You want to reconcile patient’s active medications with another source.

Success:

- Easily completed
- Completed with difficulty or help (Describe below)
- Not completed

Comments:

Task Time: _____ Seconds

Optimal Path:

1. From the left pane, click the Facesheet icon.
2. On the Patient Search screen, select patient.
3. Start a new encounter or edit an in-progress encounter.
4. From the links shown on the top, click Medications/Allergies.
5. Click the Reconcile Medications & Allergies button.
6. In the Medications List section, click the Browse button; select the xml file.
7. Click Upload.
8. Once the xml file is uploaded, add it to the preview list.
9. Click Confirm. The imported medications will be merged with the existing medications in the system.

Actual Path:

- Correct
- Minor Deviations / Cycles (Describe below)
- Major Deviations (Describe below)

Comments:

Observed Errors and Verbalizations:

Comments:

Rating: Overall, this task was: _____

Show participant written scale: “Very Difficult” (1) to “Very Easy” (5)

Administrator / Note taker Comments:



Task 28: Reconcile patient's active problem list with another source (50 Seconds)

Take the participant to the starting point for the task.

You want to reconcile patient's active problem list with another source.

Success:

- Easily completed
- Completed with difficulty or help (Describe below)
- Not completed

Comments:

Task Time: _____ Seconds

Optimal Path:

1. From the left pane, click the Facesheet icon.
2. On the Patient Search screen, select patient.
3. Start a new encounter or edit an in-progress encounter.
4. From the links shown on the top, click Problem List.
5. Click the Reconcile Problem List button.
6. Click the Browse button; select the xml file.
7. Click Upload.
8. Once the xml file is uploaded, add it to the preview list.
9. Click Confirm. The imported problems will be merged with the existing problems in the system.

Actual Path:

- Correct
- Minor Deviations / Cycles (Describe below)
- Major Deviations (Describe below)

Comments:

Observed Errors and Verbalizations:

Comments:

Rating: Overall, this task was: _____

Show participant written scale: "Very Difficult" (1) to "Very Easy" (5)

Administrator / Note taker Comments:



Task 29: Reconcile patient's active medication allergy list with another source.

(50 Seconds)

Take the participant to the starting point for the task.

You want to reconcile patient's active medications allergy with another source.

Success:

- Easily completed
- Completed with difficulty or help (Describe below)
- Not completed

Comments:

Task Time: _____ Seconds

Optimal Path:

1. From the left pane, click the Facesheet icon.
2. On the Patient Search screen, select patient.
3. Start a new encounter or edit an in-progress encounter.
4. From the links shown on the top, click Medications/Allergies.
5. Click the Reconcile Medications & Allergies button.
6. In the Allergies List section, click the Browse button; select the xml file.
7. Click Upload.
8. Once the xml file is uploaded, add it to the preview list.
9. Click Confirm. The imported allergies will be merged with the existing allergies in the system.

Actual Path:

- Correct
- Minor Deviations / Cycles (Describe below)
- Major Deviations (Describe below)

Comments:

Observed Errors and Verbalizations:

Comments:

Rating: Overall, this task was: _____

Show participant written scale: "Very Difficult" (1) to "Very Easy" (5)

Administrator / Note taker Comments:



Task 30: Record patient’s demographic information. (30 Seconds)

Take the participant to the starting point for the task.

You want to add a new patient into the system.

Success:

- Easily completed
- Completed with difficulty or help (Describe below)
- Not completed

Comments:

Task Time: _____ Seconds

Optimal Path:

1. From the left pane, click Patient Search icon.
2. Click the Add Patient button.
3. Record mandatory details marked with red asterisk sign.
4. Click Save.

Actual Path:

- Correct
- Minor Deviations / Cycles (Describe below)
- Major Deviations (Describe below)

Comments:

Observed Errors and Verbalizations:

Comments:

Rating:

Overall, this task was: _____

Show participant written scale: “Very Difficult” (1) to “Very Easy” (5)

Administrator / Note taker Comments:



Task 31: Change patient’s demographic information. (25 Seconds)

Take the participant to the starting point for the task.

You already have a patient into the system and now you want to update some of the patient details.

Success:

- Easily completed
- Completed with difficulty or help (Describe below)
- Not completed

Comments:

Task Time: _____ Seconds

Optimal Path:

1. From the left pane, click Patient Search icon.
2. Using smart search box, type in patient name whose details are to be updated.
3. Click the Edit icon appearing next to the patient name.
4. Change the details as per your requirement.
5. Click Save.

Actual Path:

- Correct
- Minor Deviations / Cycles (Describe below)
- Major Deviations (Describe below)

Comments:

Observed Errors and Verbalizations:

Comments:

Rating: Overall, this task was: _____

Show participant written scale: “Very Difficult” (1) to “Very Easy” (5)

Administrator / Note taker Comments:



Task 32: Access patient’s demographic information. (10 Seconds)

Take the participant to the starting point for the task.

You want to access/view patient’s demographic information.

Success:

- Easily completed
- Completed with difficulty or help (Describe below)
- Not completed

Comments:

Task Time: _____ Seconds

Optimal Path:

1. From the left pane, click Patient Search icon.
2. List of patients will appear on the Patient Search screen along with the demographic details.
3. To view demographic details of specific patient, type in patient name in the smart search box and click Search.

Actual Path:

- Correct
- Minor Deviations / Cycles (Describe below)
- Major Deviations (Describe below)

Comments:

Observed Errors and Verbalizations:

Comments:

Rating:

Overall, this task was: _____

Show participant written scale: “Very Difficult” (1) to “Very Easy” (5)

Administrator / Note taker Comments:



Task 33: Record patient's Problem List. (35 Seconds)

Take the participant to the starting point for the task.

You want to add any new problems for the patient.

Success:

- Easily completed
- Completed with difficulty or help (Describe below)
- Not completed

Comments:

Task Time: _____ Seconds

Optimal Path:

1. On the top menu bar, click Facesheet.
2. Select a patient from the list.
3. Start a new encounter or edit an in-progress encounter.
4. From the links shown on the top, click Problem List.
5. Start typing in Illness and you will see a list of matching illnesses. Select the one from the list.
6. Enter the Onset Date.
7. Enter other mandatory fields.
8. Click Save. Problem will be added to the following grid.

Actual Path:

- Correct
- Minor Deviations / Cycles (Describe below)
- Major Deviations (Describe below)

Comments:

Observed Errors and Verbalizations:

Comments:

Rating: Overall, this task was: _____

Show participant written scale: "Very Difficult" (1) to "Very Easy" (5)

Administrator / Note taker Comments:



Task 34: Edit patient's Problem List. (30 Seconds)

Take the participant to the starting point for the task.

You want to change some details recorded in the patient's problem list.

Success:

- Easily completed
- Completed with difficulty or help (Describe below)
- Not completed

Comments:

Task Time: _____ Seconds

Optimal Path:

1. On the top menu bar, click Facesheet.
2. Select a patient from the list.
3. Start a new encounter or edit an in-progress encounter.
4. From the links shown on the top, click Problem List.
5. Click the Edit icon next to the problem name.
6. Change the details such as Onset Date, Illness Status, Illness Type, or Comments, if any.
7. Click Save. Updated problem details can be seen in the following grid.

Actual Path:

- Correct
- Minor Deviations / Cycles (Describe below)
- Major Deviations (Describe below)

Comments:

Observed Errors and Verbalizations:

Comments:

Rating: Overall, this task was: _____

Show participant written scale: "Very Difficult" (1) to "Very Easy" (5)

Administrator / Note taker Comments:



Task 35: Access patient’s historical and current Problem List. (25 Seconds)

Take the participant to the starting point for the task.

You want to view historical problems for the patient.

Success:

- Easily completed
- Completed with difficulty or help (Describe below)
- Not completed

Comments:

Task Time: _____ Seconds

Optimal Path:

1. On the top menu bar, click Facesheet.
2. Select a patient from the list.
3. Start a new encounter or edit an in-progress encounter.
4. From the links shown on the top, click Problem List. Patient’s current problems appear on the screen.
5. Select the Show History check box. This will show patient’s problem history.

Actual Path:

- Correct
- Minor Deviations / Cycles (Describe below)
- Major Deviations (Describe below)

Comments:

Observed Errors and Verbalizations:

Comments:

Rating:

Overall, this task was: _____

Show participant written scale: “Very Difficult” (1) to “Very Easy” (5)

Administrator / Note taker Comments:



Task 36: Locate the new Implantable Device section. (25 Seconds)

Take the participant to the starting point for the task.

You want to locate a new Implantable Device recorded in the system.

Success:

- Easily completed
- Completed with difficulty or help (Describe below)
- Not completed

Comments:

Task Time: _____ Seconds

Optimal Path:

1. On the top menu bar, click Facesheet.
2. Select a patient from the list.
3. Start a new encounter or edit an in-progress encounter.
4. From the links shown on the top, click History.
5. Click the Medical History tab.
6. Locate the Implantable Device tab in Medical History.

Actual Path:

- Correct
- Minor Deviations / Cycles (Describe below)
- Major Deviations (Describe below)

Comments:

Observed Errors and Verbalizations:

Comments:

Rating: Overall, this task was: _____

Show participant written scale: "Very Difficult" (1) to "Very Easy" (5)

Administrator / Note taker Comments:



Task 37: Add the new Implantable Device section. (35 Seconds)

Take the participant to the starting point for the task.

You want to add a new Implantable Device in the system.

Success:

- Easily completed
- Completed with difficulty or help (Describe below)
- Not completed

Comments:

Task Time: _____ Seconds

Optimal Path:

1. On the top menu bar, click Facesheet.
2. Select a patient from the list.
3. Start a new encounter or edit an in-progress encounter.
4. From the links shown on the top, click History.
5. Click the Medical History tab.
6. Access the Implantable Device tab in Medical History.
7. Type in Device Detail, for example, (01)00643169007222(17)160128(21)BLC200461H, and click Search.
8. All the details will automatically be filled up in the respective fields. Click Save.
9. The device will be added in the following grid.

Actual Path:

- Correct
- Minor Deviations / Cycles (Describe below)
- Major Deviations (Describe below)

Comments:

Observed Errors and Verbalizations:

Comments:

Rating: Overall, this task was: _____

Show participant written scale: "Very Difficult" (1) to "Very Easy" (5)

Administrator / Note taker Comments:



Task 38: Change the new Implantable Device section. (30 Seconds)

Take the participant to the starting point for the task.

You want to update details about the Implantable Device added in the system.

Success:

- Easily completed
- Completed with difficulty or help (Describe below)
- Not completed

Comments:

Task Time: _____ Seconds

Optimal Path:

1. On the top menu bar, click Facesheet.
2. Select a patient from the list.
3. Start a new encounter or edit an in-progress encounter.
4. From the links shown on the top, click History.
5. Click the Medical History tab.
6. Access the Implantable Device tab in Medical History.
7. The device details appear in the grid. Click the Edit icon next to device name.
8. Change necessary details and click Save.

Actual Path:

- Correct
- Minor Deviations / Cycles (Describe below)
- Major Deviations (Describe below)

Comments:

Observed Errors and Verbalizations:

Comments:

Rating: Overall, this task was: _____

Show participant written scale: "Very Difficult" (1) to "Very Easy" (5)

Administrator / Note taker Comments:



Task 39: Access the new Implantable Device section. (25 Seconds)

Take the participant to the starting point for the task.

You want to access the Implantable Device section to view all the devices recorded in the system.

Success:

- Easily completed
- Completed with difficulty or help (Describe below)
- Not completed

Comments:

Task Time: _____ Seconds

Optimal Path:

1. On the top menu bar, click Facesheet.
2. Select a patient from the list.
3. Start a new encounter or edit an in-progress encounter.
4. From the links shown on the top, click History.
5. Click the Medical History tab.
6. Click the Implantable Device tab in Medical History.
7. Access all the implantable devices that are recorded in the system.

Actual Path:

- Correct
- Minor Deviations / Cycles (Describe below)
- Major Deviations (Describe below)

Comments:

Observed Errors and Verbalizations:

Comments:

Rating: Overall, this task was: _____

Show participant written scale: "Very Difficult" (1) to "Very Easy" (5)

Administrator / Note taker Comments



6.2 Appendix B: PARTICIPANT DEMOGRAPHICS

Following is a high-level overview of the participants in this study.

Gender

Men	:	2
Women	:	8
Total Participants	:	10

Occupation/Role:

Physician	:	1
Medical Assistant	:	5
Office Manager	:	1
Nurse	:	2
Front Desk Executives	:	1
Total Participants	:	10

Years of Experience:

(0-5) years	:	4
(6-10) years	:	4
(11-15) years	:	2
Total Participants	:	10



6.3 Appendix C: SYSTEM USABILITY SCALE QUESTIONNAIRE

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