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Usability Report

06/01/2017

A report based on NISTIR 7742 Customized Common Industry Format for Usability Test Reports.

UniCharts EMR, Version 5.0
Usability Test Report

Company Name:	**UnisonCare Corporation**
Product/Version Tested:	**UniCharts EMR, Version 5.0**
Date of Usability Test:	**05/15/2017 – 05/26/2017**
Date of Report:	**06/01/2017**
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A Usability Test Report based on NISTIR 7742
Customized Common Industry Format (ISO/IEC 25062:2006)

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1. Executive Summary

This report documents the findings of a usability test of UniCharts EMR version 5 electronic medical records system. The test was conducted from May 15, 2017 through May 26, 2017 at the offices of Colonial Medcare PC, Virginia. The purpose of the testing was to test and validate the design of UniCharts EMR user interface so that it could serve as an evidence of usability of the UniCharts electronic medical records software in a real-life clinical environment. The goal was for users to interact safely, effectively and efficiently with the EMR system, and to do that with an acceptable level of satisfaction.

During the usability test, one healthcare provider and four employees matching the target demographic criteria served as participants. The participants had prior experience with UniCharts EMR but no additional training was provided for the purpose of this usability test. Furthermore, all participant data was de-identified so that no reference could be made from the identity of the participant to the data collected. At the end of testing process, the participants were asked to complete a post-test questionnaire and were not compensated by UnisonCare for their time.

This study collected performance data on the following categories that are typically conducted on UniCharts EMR.

- **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 interaction 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**
- **170 315(b)(3) Electronic Prescribing**

Participants were overall very pleased with the product whereas four out of five expressed particular appreciation for the longitudinal chart forms, the balanced number of data fields available on respective screens and the ease of access to relevant patient information from any point within the system.

2. Introduction

The usability testing for UniCharts EMR, Version 5.0 attempted to represent realistic workflow and conditions that are encountered in real-life clinical environments. As the purpose of this study was to test and validate the design of the current user interface of EMR and provide evidence of its usability, all the measures of effectiveness, efficiency and user satisfaction such as completion of tasks, accuracy of completed tasks, and any deviations from optimal path were captured during the usability testing. Various standard metrics, as outlined in the NISTIR 7741 guidelines, were used to evaluate the usability of UniCharts EMR system.

3. Method

3.1 INTENDED USERS

The intended users of UniCharts EMR version 5 are ambulatory providers/therapists and their staff members, which may include nurses, medical assistants, front office clerks and billers.

3.2 PARTICIPANTS

A total of 10 people participated in the usability test, including two healthcare providers and eight support staff, all matching the intended users of the system. To match as much as possible, participants were required to be current users of EMR for a minimum of one year and be working with patients on a routine basis. All participants showed up for the study even though they were not compensated by UnisonCare for their time.

A detailed summary of participant characteristics, including demographics, professional and computing experience is shown below. Note that the participant names have been replaced with Participant IDs so that an individual's data cannot be tied back to his or her individual identity.

User ID	Sex	Age	Education	Professional Role	Professional Experience	Computer Experience	Product Experience
User1	M	54	MD	Provider	> 20 years	> 19 years	Medium
User2	M	50	Graduate	Admin	> 20 years	> 15 years	Medium
User3	F	52	Graduate	Admin/Biller	> 20 years	> 19 years	Medium
User4	F	48	Some	Scheduler	> 20 years	> 15 years	Low
User5	F	44	Some	Nurse	> 15 years	> 10 years	Low
User6	F	59	Some	Nurse	> 20 years	> 10 years	Medium
User7	F	27	Some	Nurse	> 6 years	> 5 years	Low
User8	M	40	Some	Nurse	> 10 years	> 10 years	Low

User9	F	30	Some	Nurse	> 8 years	> 10 years	Low
User10	F	29	Some	Nurse	> 6 years	> 5 years	Low

3.3 STUDY DESIGN

The objective of this test was to highlight areas where the EMR application performed well – that is, effectively, efficiently, and with satisfaction of the participants, and also uncover the areas where the application failed to meet the needs of the participants. The data from this test is expected to serve as a baseline for future tests with an updated version of UniCharts EMR or comparison with other similar systems available in the market.

Each participant used the system in the same location and interacted directly with UniCharts EMR using the same set of instructions. The system was evaluated for effectiveness, efficiency and satisfaction by collecting data on:

- Time to complete the tasks
- Number and types of errors
- Path deviations, if any
- Participant's verbal comments
- Participant's satisfaction ratings of the system

3.4 TASKS

The following user tasks were tested during the usability testing. These tasks were designed keeping in view the activities that real users will commonly perform using UniCharts EMR (see page 14-27 (Appendix B) for complete details on these tasks).

- **170.315(a)(1) Computerized provider order entry – medication**
  - Record Medication Order
  - Change Medication Order
  - Access Medication Order

- **170.315(a)(2) Computerized provider order entry – laboratory**
  - Record Laboratory Order
  - Change Laboratory Order
  - Access Laboratory Order

- **170.315(a)(3) Computerized provider order entry – diagnostic imaging**
  - Record Radiology/Imaging Order
  - Change Radiology/Imaging Order
  - Access Radiology/Imaging Order

- **170.315(a)(4) Drug-drug, Drug-allergy interaction checks**
  - Create Interventions Prior to CPOE Completion
  - Adjustment of Intervention Severity

- **170.315(a)(5) Demographics**
  - Record Race and Ethnicity
  - Record Preferred Language
  - Record Sex
  - Record Sexual Orientation
  - Record Gender Identity
  - Record Date of Birth
  - Change Race and Ethnicity
  - Change Preferred Language
  - Change Sex
  - Change Sexual Orientation
  - Change Gender Identity
  - Change Date of Birth
  - Access Race and Ethnicity
  - Access Preferred Language
  - Access Sex
  - Access Sexual Orientation
  - Access Gender Identity
  - Access Date of Birth

- **170 315(a)(6) Problem List**
  - Record Problem List
  - Change Problem List
  - Access Problem List

- **170 315(a)(7) Medication List**
  - Record Medication List
  - Change Medication List
  - Access Medication List

- **170 315(a)(8) Medication allergy List**
  - Record Allergy List
  - Change Allergy List
  - Access Allergy List

- **170 315(a)(9) Clinical Decision Support**
  - Problem List Interventions
  - Medication List Interventions

- Medication Allergy List Interventions
- Demographics Interventions
- Lab Test and Results Interventions
- Vital Signs Interventions
- Identify User Diagnostic and Therapeutic Reference Information
- Configuration of CDS Interventions by User Admin Level User

- **170 315(a)(14) Implantable Device List**
  - Record implantable device UDI
  - Change implantable device UDI
  - Access implantable device UDI
  - Record if there is no device Implanted

- **170 315(b)(2) Clinical Information Reconciliation**
  - Reconcile Patient's Active Medication List with another Source
  - Reconcile Patient's Active Problem List with another Source
  - Reconcile Patient's Active Medication Allergy List with another Source

- **170 315(b)(3) Electronic Prescribing**
  - Create Prescriptions

3.5 TASK PRIORITIZATION

The above list represents the total number of tasks that were conducted during the usability tests. However, during the actual testing session, the tasks were prioritized in accordance with risk associated with user errors. For example, while testing the Clinical Decision Support interventions, Medication List Interventions were at a higher priority than Identification of Diagnostic and Therapeutic Reference Information.

3.6 TEST PROCEDURE

Participants were assigned a participant ID. Before entering the test, each participant reviewed and signed an informed consent and release form in presence of a representative from the test conducting team (See Appendix A). To ensure that the test ran smoothly, two test team members also participated in this test, to provide clarifications to the participants and log the data as needed. Participants were instructed to perform the tasks as per below instructions:

• As quickly as possible making as few errors and deviations as possible.
• Without assistance
• Without using a think aloud technique.

3.7 TEST LOCATION

The testing was done at Colonial Medcare PC offices at Colonial Heights VA, 23834. The office facility included a waiting area and a quiet testing location with tables and computers. The observers and the data logger were seated in a separate area of the room where they could see the participant's screens and also listen to the audio of the test 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.

3.8 TEST ENVIRONMENT

The UniCharts EMR is typically be used on a network within a healthcare office or facility. As such, the testing was conducted in a multi-room setup to simulate an office environment.

For testing, the computers used were Intel 64 bit desktops and laptops running 32bit and 64bit Microsoft Windows7 operating system. The participants used a generic mouse, keyboard, when interacting with the EMR application.

3.9 USABILITY METRICS

The goals of the test were to assess:

1. Effectiveness of UniCharts EMR version 5.0 by measuring participant success rates and errors
2. Efficiency of UniCharts EMR version 5.0 by measuring the average task time and path deviations
3. Satisfaction with UniCharts EMR version 5.0 by measuring ease of use ratings and comments

3.10 DATA SCORING

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

MEASURES	RATIONALE AND SCORING
Effectiveness: Task Success	A task was counted as a "Success" if the participant was able to achieve the correct outcome, without assistance, within the time allotted on a per task basis. The total number of successes were calculated for each task and then divided by the total number of times that task was attempted. The results are provided as a percentage. Task times were recorded for successes. Observed task times divided by the optimal time for each task is a measure of optimal efficiency. Optimal task performance time, as benchmarked by expert performance under realistic conditions, is recorded when constructing tasks. Target task times used for task times in the Moderator's Guide must be operationally defined by taking multiple measures of optimal performance and multiplying by a factor of 2.0 that allows some time buffer because the participants are presumably not trained to expert performance. Thus, if expert, optimal performance on a task was 90 seconds then allotted task time performance was 180 seconds. This ratio should be aggregated across tasks and reported with mean and variance scores.
Effectiveness: Task Failures	If the participant abandoned the task, did not reach the correct answer or performed it incorrectly, or reached the end of the allotted time before successful completion, the task was counted as a "Failure." No task times were taken for errors. The total number of errors was calculated for each task and then divided by the total number of times that task was attempted. Not all deviations would be counted as errors. This should also be expressed as the mean number of failed tasks per participant. On a qualitative level, an enumeration of errors and error types are collected.
Efficiency: Task Deviations	The participant's path/steps through the application were 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.
Efficiency: Task Time	Each task was timed from when the administrator said "Begin" until the participant said, "Done." If he or she failed to say "Done," the time was stopped when the participant stopped performing the task. Only task times for tasks that were successfully completed were included in the average task time analysis. Average time per task was calculated for

	each task. Variance measures (standard deviation and standard error) were also calculated.
Satisfaction: Task Rating	Participant's subjective impression of the ease of use of the application was measured by administering both a simple post-task question as well as a post-session questionnaire. After each task, the participant was asked to rate "Overall, this task was:" on a scale of 1 (Very Difficult) to 5 (Very Easy). These data are averaged across participants. Common convention is that average ratings for systems judged easy to use should be 3.3 or above. To measure participants' confidence in and likeability of the UniCharts EMR 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 results of the usability test were calculated according to the methods specified in the Usability Metrics section above. Participants who failed to follow session and task instructions had their data excluded from the analyses. There were no exclusions in this test based on that criterion.

The usability testing results for the UniCharts EMR are detailed below. The results should be seen in light of the objectives and goals outlined in Section: Study Design. The data should yield actionable results that, if corrected, yield material, positive impact on user performance.

Task #	Measure Tested	Task Success	Path Optimal Count	Path Observed Count	Task Time (sec)	Task Time Optimal	High Low (sec)	Errors Count	Task Satisfaction Ratings
1	**CPOE - Medications**	90 %	25	27	65	< 100	95/60	2	4.1
2	**CPOE - Laboratory**	90 %	25	26	60	< 100	90/50	2	4.1
3	**CPOE - Diagnostic Imaging**	90 %	25	26	60	< 100	90/50	2	4.1
4	**Drug-Drug Drug-Allergy**	100 %	30	32	70	< 100	80/60	0	4.8
5	**Demographics**	95 %	30	32	180	< 200	200/150	0	4.8
6	**Problem List**	95 %	25	30	150	< 200	160/90	1	4.4
7	**Medication List**	95 %	25	30	150	< 200	150/90	1	4.4
8	**Medication Allergy List**	100 %	10	11	90	< 100	90/80	0	4.9
9	**CDS**	90 %	20	22	150	< 200	180/110	0	4.2
10	**Implantable Device List**	95 %	20	22	80	< 100	120/70	0	4.8
11	**Clinical Info Reconciliation**	100 %	20	22	280	< 250	320/200	2	4.7
12	**Electronic Prescribing**	80 %	5	7	190	< 200	230/150	1	4.5

Based on performance with the above tasks, the results from the System Usability Scale (Appendix C) scored the mean score of 84 for subjective satisfaction with the system.

The System Usability Scale (SUS) survey yields a single number that represents a composite measure of the overall perceived usability of the system. SUS scores have a

range of 0 to 100 and the score is a relative benchmark that is used against other iterations of the system. Broadly interpreted, scores under 60 represent systems with poor usability whereas the scores over 80 are considered to be above average.

4.2 DISCUSSION OF THE FINDINGS AND EFFECTIVENESS

In most of the tasks assigned to participants the task was completed effectively. Error rates were relatively low with few of the tasks recording no errors at all. While participants believed that the efficiency can be improved on for managing Demographics and CDS rules, no errors were recorded for these tasks. Furthermore, the participants had to hand type the severities of the allergic reactions and felt that it would be faster to have a dropdown option for this. The task with the highest number of errors was CPOE for medications, laboratory and imaging, where the participants tended to get confused with different type of blocks due to their similarity. This will be addressed in future version of the system by providing color-coding or any other mechanism to easily distinguish between Rx, Orders and Diagnosis blocks on the encounter form.

4.3 EFFICIENCY

Participants followed the optimal paths to complete assigned tasks most of the time. However, there were minor path deviations in some tasks and in almost all such cases resulted in exceeding allotted time. The task that participants found to be the least effective was clincial ordering and the task that took the longest to complete on average was reconciliation of clinical information. This was probably due to the fact that the comparing and reconciling clinical information is a time consuming task by its nature.

4.4 SATISFACTION

All five participants completed the System Usability Scale questionnaire (Appendix C) at the end of their session. The user satisfaction rating was high and the system scored an average of 84. Users overall expressed satisfaction with the system and there was a strong correlation between users who have "Medium" level experience with the system to have a higher satisfaction rating than the users who have "Low" level prior experience.

4.5 MAJOR FINDINGS AND AREAS FOR IMPROVEMENT

The study determined that our intended audience finds the application to have a good flow from one area to the next and was relatively easy to learn and use. But while participants expressed their general satisfaction of the system, they expressed the need for having provider specific medication favorite lists in the system. We have forwarded this observation to our development team for necessary evaluation and implementation

in future versions of the system. Clinical information reconciliation took longer than optimal but we think it was not only due to the fact that this feature is relatively new in the system but also because comparing and reconciling information is a time consuming task by nature. Participants of the study expressed their satisfaction over the capability of adjusting CDS alert severity levels in the system. However, there was one area that almost all participants complained about. It was the small sizes of buttons and icons that they found very difficult to effectively target and click. We believe this is because monitors with high screen resolutions are becoming more common and therefore we do believe this to be a genuine shortcoming and will take steps to resolve it with the next releases of our system.

5. APPENDICES

5.1 APPENDIX A

INFORMED CONSENT AND NON-DISCLOSURE AGREEMENT

INFORMED CONSENT FORM

UnisonCare Corporation would like to thank you for participating in this study without expecting any compensation. The purpose of this study is to evaluate an electronic health records system. If you decide to participate, you will be asked to perform several tasks using the prototypes and give your feedback. The study will last about three to four hours.

AGREEMENT

I understand and agree that as a voluntary participant in the present study conducted by UnisonCare Corporation. I am free to withdraw consent or discontinue participation at any time. I understand and agree to participate in the study conducted and recorded by the UnisonCare Corporation. During the evaluation, I understand that I may learn information that is confidential to UnisonCare Corporation. I agree to treat all confidential information received during this evaluation in accordance with this non-disclosure agreement. Accordingly, I will not disclose confidential information to any third parties. I understand and consent to the use and release of the videotape by UnisonCare Corporation. I understand that the information and videotape is for research purposes only and that my name and image will not be used for any purpose other than research. I relinquish any rights to the videotape and understand the videotape may be copied and used by UnisonCare Corporation without further permission.

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

I understand and agree that the data collected from this study may be shared with third parties. I understand and agree that data confidentiality is assured, because only de-identified data will be used in analysis and reporting of the results. I agree to immediately raise any concerns or areas of discomfort with the study administrator. I understand that I can leave at any time.

_____	_____	_____
Name (please print)	Signature	Date

5.2 APPENDIX B
PERFORMED TASKS

Task 1: Record Medication Order
Physician decides to prescribe Metolazone 20 mg Capsules. Record this information in the patient's chart.
Success:
☐ Successful without assistance
☐ Completed with difficulty or help - Describe below
☐ Not completed
Comments:
Task Time: _____ Seconds
Optimal Path: Encounter Form → Rx/Prescription Block → Favorite List → Select
☐ Correct
☐ Minor Deviations - Describe below
☐ Major Deviations - Describe below
Comments:
Observed Errors and Verbalizations:
Comments:
Rating:
Overall, this task was: _____ "Very Easy" (1) to "Very Difficult" (5)

Task 2: Change Medication Order
Physician changes his mind and now wants to give Metolazone 30 mg Capsules. Edit the information on chart to reflect this change.
Success:
☐ Successful without assistance
☐ Completed with difficulty or help - Describe below
☐ Not completed
Comments:
Task Time: _____ Seconds
Optimal Path: Encounter Form → Rx/Prescription Block → Delete → Favorite List → Select
☐ Correct
☐ Minor Deviations - Describe below
☐ Major Deviations - Describe below
Comments:
Observed Errors and Verbalizations:
Comments:
Rating:

Overall, this task was: _____ “Very Easy” (1) to “Very Difficult” (5)

Task 3: Access Medication Order

Access the recently entered medication order in the patient’s record.

Success:

☐ Successful without assistance
☐ Completed with difficulty or help - Describe below
☐ Not completed

Comments:

Task Time: _____ Seconds

Optimal Path: Encounter Form → Rx/Prescription Block

☐ Correct
☐ Minor Deviations - Describe below
☐ Major Deviations - Describe below

Comments:

Observed Errors and Verbalizations:

Comments:

Rating:

Overall, this task was: _____ “Very Easy” (1) to “Very Difficult” (5)

Task 4: Record Laboratory Order

Physician also decides to order a CBC panel. Enter the order in patient’s chart.

Success:

☐ Successful without assistance
☐ Completed with difficulty or help - Describe below
☐ Not completed

Comments:

Task Time: _____ Seconds

Optimal Path: Encounter Form → Orders/Requisitions Block → Favorite List → Select

☐ Correct
☐ Minor Deviations - Describe below
☐ Major Deviations - Describe below

Comments:

Observed Errors and Verbalizations:

Comments:

Rating:

Overall, this task was: _____ “Very Easy” (1) to “Very Difficult” (5)

Task 5: Change Laboratory Order

Physician changes his mind and decide to order a Lipid panel instead. Update the previous order.

Success:

☐ Successful without assistance
☐ Completed with difficulty or help - Describe below
☐ Not completed

Comments:

Task Time: _____ Seconds

Optimal Path: Encounter Form → Orders/Requisitions → Delete → Favorite List → Select

☐ Correct
☐ Minor Deviations - Describe below
☐ Major Deviations - Describe below

Comments:

Observed Errors and Verbalizations:

Comments:

Rating:

Overall, this task was: _____ "Very Easy" (1) to "Very Difficult" (5)

Task 6: Access Laboratory Order

Review the laboratory orders written by the physician for this patient.

Success:

☐ Successful without assistance
☐ Completed with difficulty or help - Describe below
☐ Not completed

Comments:

Task Time: _____ Seconds

Optimal Path: Encounter Form → Orders/Requisitions Block → Lab Section

☐ Correct
☐ Minor Deviations - Describe below
☐ Major Deviations - Describe below

Comments:

Observed Errors and Verbalizations:

Comments:

Rating:

Overall, this task was: _____ "Very Easy" (1) to "Very Difficult" (5)

Task 7: Record Radiology/Imaging Order

Physician decides to write a radiology order "Hip, Unilateral X-Ray" for this patient

Success:

☐ Successful without assistance
☐ Completed with difficulty or help - Describe below
☐ Not completed

Comments:

Task Time: _____ Seconds
Optimal Path: Encounter Form → Orders/Requisitions Block → Favorite List → Select
☐ Correct
☐ Minor Deviations - Describe below
☐ Major Deviations - Describe below
Comments:
Observed Errors and Verbalizations:
Comments:
Rating:
Overall, this task was: _____ "Very Easy" (1) to "Very Difficult" (5)

Task 8: Change Radiology/Imaging Order
Physician decides to order "Hip, Bilateral X-Ray" instead. Change the order on patient's chart.
Success:
☐ Successful without assistance
☐ Completed with difficulty or help - Describe below
☐ Not completed
Comments:
Task Time: _____ Seconds
Optimal Path: Encounter Form → Orders/Requisitions → Delete → Favorite List → Select
☐ Correct
☐ Minor Deviations - Describe below
☐ Major Deviations - Describe below
Comments:
Observed Errors and Verbalizations:
Comments:
Rating:
Overall, this task was: _____ "Very Easy" (1) to "Very Difficult" (5)

Task 9: Access Radiology/Imaging Order
Review radiology tests ordered by the physician for this patient.
Success:
☐ Successful without assistance
☐ Completed with difficulty or help - Describe below
☐ Not completed
Comments:
Task Time: _____ Seconds
Optimal Path: Encounter Form → Orders/Requisitions Block → Radiology Section
☐ Correct
☐ Minor Deviations - Describe below

☐ Major Deviations - Describe below
Comments:
Observed Errors and Verbalizations:
Comments:
Rating:
Overall, this task was: _____ "Very Easy" (1) to "Very Difficult" (5)

Task 10: Create Interventions Prior to CPOE Completion
Create a drug-drug interaction for Cordarone and Levaquin with "semi-blocking" alert
Success:
☐ Successful without assistance
☐ Completed with difficulty or help - Describe below
☐ Not completed
Comments:
Task Time: _____ Seconds
Optimal Path: Customization Area → Clinic/Staff Tab → CDS Section → Add Rule → Save
☐ Correct
☐ Minor Deviations - Describe below
☐ Major Deviations - Describe below
Comments:
Observed Errors and Verbalizations:
Comments:
Rating:
Overall, this task was: _____ "Very Easy" (1) to "Very Difficult" (5)

Task 11: Adjustment of Intervention Severity
Increase the severity level for above drug-drug interaction to a "completely blocking" alert
Success:
☐ Successful without assistance
☐ Completed with difficulty or help - Describe below
☐ Not completed
Comments:
Task Time: _____ Seconds
Optimal Path: Customization Area → Clinic/Staff Tab → CDS Section → Edit Rule → Save
☐ Correct
☐ Minor Deviations - Describe below
☐ Major Deviations - Describe below
Comments:
Observed Errors and Verbalizations:

Comments:
Rating:
Overall, this task was: _____ "Very Easy" (1) to "Very Difficult" (5)

Task 12: Record Medication List
Patient states that he is currently taking 10 mg of Lipitor per day. Enter this information.
Success:
☐ Successful without assistance
☐ Completed with difficulty or help - Describe below
☐ Not completed
Comments:
Task Time: _____ Seconds
Optimal Path: History Form → Master Medication List → Favorite List → Select
☐ Correct
☐ Minor Deviations - Describe below
☐ Major Deviations - Describe below
Comments:
Observed Errors and Verbalizations:
Comments:
Rating:
Overall, this task was: _____ "Very Easy" (1) to "Very Difficult" (5)

Task 13: Change Medication List
After entry, patient remembers that he is taking 20 mg of Lipitor. Update the patient's record.
Success:
☐ Successful without assistance
☐ Completed with difficulty or help - Describe below
☐ Not completed
Comments:
Task Time: _____ Seconds
Optimal Path: History Form → Master Medication List → Delete → Favorite List → Select
☐ Correct
☐ Minor Deviations - Describe below
☐ Major Deviations - Describe below
Comments:
Observed Errors and Verbalizations:
Comments:
Rating:
Overall, this task was: _____ "Very Easy" (1) to "Very Difficult" (5)

Task 14: Access Medication List

Access the patient's master medication list within the chart.

Success:

☐ Successful without assistance
☐ Completed with difficulty or help - Describe below
☐ Not completed

Comments:

Task Time: _____ Seconds

Optimal Path: History Form → Master Medication List

☐ Correct
☐ Minor Deviations - Describe below
☐ Major Deviations - Describe below

Comments:

Observed Errors and Verbalizations:

Comments:

Rating:

Overall, this task was: _____ "Very Easy" (1) to "Very Difficult" (5)

Task 15: Record Allergy List

Patient has reported an allergy to Penicillin with reaction of "hives". Add this allergy to chart.

Success:

☐ Successful without assistance
☐ Completed with difficulty or help - Describe below
☐ Not completed

Comments:

Task Time: _____ Seconds

Optimal Path: History Form → Known Allergies → Favorite List → Select

☐ Correct
☐ Minor Deviations - Describe below
☐ Major Deviations - Describe below

Comments:

Observed Errors and Verbalizations:

Comments:

Rating:

Overall, this task was: _____ "Very Easy" (1) to "Very Difficult" (5)

Task 16: Change Allergy List

Patient also states that his allergy to Cefzil has become "severe". Review and update

Success:

☐ Successful without assistance

☐ Completed with difficulty or help - Describe below
☐ Not completed
Comments:
Task Time: _____ Seconds
Optimal Path: History Form → Known Allergies → Update Reaction
☐ Correct
☐ Minor Deviations - Describe below
☐ Major Deviations - Describe below
Comments:
Observed Errors and Verbalizations:
Comments:
Rating:
Overall, this task was: _____ "Very Easy" (1) to "Very Difficult" (5)

Task 17: Access Allergy List
Access the previously entered allergies within the patient's chart.
Success:
☐ Successful without assistance
☐ Completed with difficulty or help - Describe below
☐ Not completed
Comments:
Task Time: _____ Seconds
Optimal Path: History Form → Known Allergies
☐ Correct
☐ Minor Deviations - Describe below
☐ Major Deviations - Describe below
Comments:
Observed Errors and Verbalizations:
Comments:
Rating:
Overall, this task was: _____ "Very Easy" (1) to "Very Difficult" (5)

Task 18: Record Demographics
Patient is Alice Jones Newman with birth name Alicia. She is a white European female and not hispanic or latino. She speaks English and her date of birth is 5/1/1970. She prefers to be identified as a female and declined to specify her sexual orientation. Enter this information.
Success:
☐ Successful without assistance
☐ Completed with difficulty or help - Describe below
☐ Not completed
Comments:

Task Time: _____ Seconds
Optimal Path: General Form → Select
☐ Correct
☐ Minor Deviations - Describe below
☐ Major Deviations - Describe below
Comments:
Observed Errors and Verbalizations:
Comments:
Rating:
Overall, this task was: _____ "Very Easy" (1) to "Very Difficult" (5)

Task 19: Change Demographics
The patient later specifies her sexual orientation to be bisexual. Update this information
Success:
☐ Successful without assistance
☐ Completed with difficulty or help - Describe below
☐ Not completed
Comments:
Task Time: _____ Seconds
Optimal Path: General Form → Select
☐ Correct
☐ Minor Deviations - Describe below
☐ Major Deviations - Describe below
Comments:
Observed Errors and Verbalizations:
Comments:
Rating:
Overall, this task was: _____ "Very Easy" (1) to "Very Difficult" (5)

Task 20: Access Demographics
Access the patient's demographics within the chart.
Success:
☐ Successful without assistance
☐ Completed with difficulty or help - Describe below
☐ Not completed
Comments:
Task Time: _____ Seconds
Optimal Path: General Form
☐ Correct
☐ Minor Deviations - Describe below
☐ Major Deviations - Describe below
Comments:

Observed Errors and Verbalizations:
Comments:
Rating:
Overall, this task was: _____ "Very Easy" (1) to "Very Difficult" (5)

Task 21: Record Problem List
Patient has Essential hypertension (Disorder) 59621000. Add this problem to chart.
Success:
☐ Successful without assistance
☐ Completed with difficulty or help - Describe below
☐ Not completed
Comments:
Task Time: _____ Seconds
Optimal Path: History Form → Master Problem List → Favorite List → Select
☐ Correct
☐ Minor Deviations - Describe below
☐ Major Deviations - Describe below
Comments:
Observed Errors and Verbalizations:
Comments:
Rating:
Overall, this task was: _____ "Very Easy" (1) to "Very Difficult" (5)

Task 22: Change Problem List
Patient also has Severe Hypothyroidism (Disorder) 83986005. Review and update
Success:
☐ Successful without assistance
☐ Completed with difficulty or help - Describe below
☐ Not completed
Comments:
Task Time: _____ Seconds
Optimal Path: History Form → Master Problem List → Favorite List → Select
☐ Correct
☐ Minor Deviations - Describe below
☐ Major Deviations - Describe below
Comments:
Observed Errors and Verbalizations:
Comments:
Rating:
Overall, this task was: _____ "Very Easy" (1) to "Very Difficult" (5)

Task 23: Access Problem List

Access the previously entered problems within the patient's chart.

Success:

☐ Successful without assistance
☐ Completed with difficulty or help - Describe below
☐ Not completed

Comments:

Task Time: _____ Seconds

Optimal Path: History Form → Known Allergies

☐ Correct
☐ Minor Deviations - Describe below
☐ Major Deviations - Describe below

Comments:

Observed Errors and Verbalizations:

Comments:

Rating:

Overall, this task was: _____ "Very Easy" (1) to "Very Difficult" (5)

Task 24: Problem List Interventions

Select the problem "Diabetes mellitus type 2" for this patient (to trigger problem list intervention)

Success:

☐ Successful without assistance
☐ Completed with difficulty or help - Describe below
☐ Not completed

Comments:

Task Time: _____ Seconds

Optimal Path: Encounter Form → New Diagnosis → Favorite List → Select

☐ Correct
☐ Minor Deviations - Describe below
☐ Major Deviations - Describe below

Comments:

Observed Errors and Verbalizations:

Comments:

Rating:

Overall, this task was: _____ "Very Easy" (1) to "Very Difficult" (5)

Task 25: Medication List Interventions

Select the drug "Accutane 20 mg cap" for this patient (to trigger medication list intervention)

Success:

☐ Successful without assistance

☐ Completed with difficulty or help - Describe below
☐ Not completed
Comments:
Task Time: _____ Seconds
Optimal Path: Encounter Form → Rx/Prescription → Favorite List → Select
☐ Correct
☐ Minor Deviations - Describe below
☐ Major Deviations - Describe below
Comments:
Observed Errors and Verbalizations:
Comments:
Rating:
Overall, this task was: _____ "Very Easy" (1) to "Very Difficult" (5)

Task 26: Medication Allergy List Interventions
Select the allergy "Bactrim" for this patient (to trigger medication allergy list intervention)
Success:
☐ Successful without assistance
☐ Completed with difficulty or help - Describe below
☐ Not completed
Comments:
Task Time: _____ Seconds
Optimal Path: History Form → Known Allergies → Favorite List → Select
☐ Correct
☐ Minor Deviations - Describe below
☐ Major Deviations - Describe below
Comments:
Observed Errors and Verbalizations:
Comments:
Rating:
Overall, this task was: _____ "Very Easy" (1) to "Very Difficult" (5)

Task 27: Demographics Interventions
Select the Race "Black or African American" for this patient (to trigger demographic intervention)
Success:
☐ Successful without assistance
☐ Completed with difficulty or help - Describe below
☐ Not completed
Comments:
Task Time: _____ Seconds

Optimal Path: General Form → Race Dropdown → Select

☐ Correct
☐ Minor Deviations - Describe below
☐ Major Deviations - Describe below

Comments:
Observed Errors and Verbalizations:
Comments:
Rating:
Overall, this task was: _____ "Very Easy" (1) to "Very Difficult" (5)

Task 28: Lab Test and Results Interventions

Select the lab test named "Creatinine, Serum" for this patient (to trigger lab test intervention)

Success:

☐ Successful without assistance
☐ Completed with difficulty or help - Describe below
☐ Not completed

Comments:
Task Time: _____ Seconds
Optimal Path: Encounter Form → Orders/Requisitions → Favorite List → Select

☐ Correct
☐ Minor Deviations - Describe below
☐ Major Deviations - Describe below

Comments:
Observed Errors and Verbalizations:
Comments:
Rating:
Overall, this task was: _____ "Very Easy" (1) to "Very Difficult" (5)

Task 29: Vital Signs Interventions

Select BP values more than 180/110 for this patient (to trigger vital signs intervention)

Success:

☐ Successful without assistance
☐ Completed with difficulty or help - Describe below
☐ Not completed

Comments:
Task Time: _____ Seconds
Optimal Path: Encounter Form → Vital Signs Block → BP Dropdowns → Select

☐ Correct
☐ Minor Deviations - Describe below
☐ Major Deviations - Describe below

Comments:

Observed Errors and Verbalizations:
Comments:
Rating:
Overall, this task was: _____ "Very Easy" (1) to "Very Difficult" (5)

Task 30: Identify User Diagnostic and Therapeutic Reference Information
Select the problem "Parkinsons disease" for this patient (to identify diagnostic and therapeutic reference information)
Success:
☐ Successful without assistance
☐ Completed with difficulty or help - Describe below
☐ Not completed
Comments:
Task Time: _____ Seconds
Optimal Path: Encounter Form → New Diagnosis → Favorite List → Select
☐ Correct
☐ Minor Deviations - Describe below
☐ Major Deviations - Describe below
Comments:
Observed Errors and Verbalizations:
Comments:
Rating:
Overall, this task was: _____ "Very Easy" (1) to "Very Difficult" (5)

Task 31: Configuration of CDS Interventions by User Admin Level User
Create a new CDS rule of type "Care Suggestion" that applies to all users of the EMR system
Success:
☐ Successful without assistance
☐ Completed with difficulty or help - Describe below
☐ Not completed
Comments:
Task Time: _____ Seconds
Optimal Path: Customization Area → Clinic/Staff Tab → CDS Section → Add Rule → Save
☐ Correct
☐ Minor Deviations - Describe below
☐ Major Deviations - Describe below
Comments:
Observed Errors and Verbalizations:
Comments:
Rating:

Overall, this task was: _____ “Very Easy” (1) to “Very Difficult” (5)

Task 32: Reconcile Patient’s Active Medication List with another Source

Patient has presented a CCDA from previous provider that contains medications he has been using. Reconcile the EMR’s master medication list with the medications on the presented CCDA

Success:

☐ Successful without assistance
☐ Completed with difficulty or help - Describe below
☐ Not completed

Comments:

Task Time: _____ Seconds

Optimal Path: History Form → Master Medication List Block → Reconciliation Window

☐ Correct
☐ Minor Deviations - Describe below
☐ Major Deviations - Describe below

Comments:

Observed Errors and Verbalizations:

Comments:

Rating:

Overall, this task was: _____ “Very Easy” (1) to “Very Difficult” (5)

Task 33: Reconcile Patient’s Active Problem List with another Source

Patient has presented a CCDA from previous provider that contains problems for whom he was receiving treatment. Reconcile the EMR’s master problem list with the problems on the presented CCDA

Success:

☐ Successful without assistance
☐ Completed with difficulty or help - Describe below
☐ Not completed

Comments:

Task Time: _____ Seconds

Optimal Path: History Form → Master Problem List Block → Reconciliation Window

☐ Correct
☐ Minor Deviations - Describe below
☐ Major Deviations - Describe below

Comments:

Observed Errors and Verbalizations:

Comments:

Rating:

Overall, this task was: _____ “Very Easy” (1) to “Very Difficult” (5)

Task 34: Reconcile Patient's Active Medication Allergy List with another Source
Patient has presented a CCDA from previous provider that contains a list of active medication allergies. Reconcile the EMR's allergy list with the allergies on the presented CCDA
Success:
☐ Successful without assistance
☐ Completed with difficulty or help - Describe below
☐ Not completed
Comments:
Task Time: _____ Seconds
Optimal Path: History Form → Known Allergies Block → Reconciliation Window
☐ Correct
☐ Minor Deviations - Describe below
☐ Major Deviations - Describe below
Comments:
Observed Errors and Verbalizations:
Comments:
Rating:
Overall, this task was: _____ "Very Easy" (1) to "Very Difficult" (5)

Task 35: Record Implanted Device List
Patient has an implanted cardiac resynchronization pacemaker with UDI (01)00643169007222(17)160128(21)BLC200461H. Enter this information.
Success:
☐ Successful without assistance
☐ Completed with difficulty or help - Describe below
☐ Not completed
Comments:
Task Time: _____ Seconds
Optimal Path: History Form → Implantable Devices List → Select
☐ Correct
☐ Minor Deviations - Describe below
☐ Major Deviations - Describe below
Comments:
Observed Errors and Verbalizations:
Comments:
Rating:
Overall, this task was: _____ "Very Easy" (1) to "Very Difficult" (5)

Task 36: Change Implanted Device List

Later it was found that the UDI assigning authority was FDA. Update this information

Success:

☐ Successful without assistance
☐ Completed with difficulty or help - Describe below
☐ Not completed

Comments:

Task Time: _____ Seconds

Optimal Path: History Form → Implantable Devices List → Select → Select

☐ Correct
☐ Minor Deviations - Describe below
☐ Major Deviations - Describe below

Comments:

Observed Errors and Verbalizations:

Comments:

Rating:

Overall, this task was: _____ "Very Easy" (1) to "Very Difficult" (5)

Task 37: Access Implanted Device List

Access the patient's implanted device list within the chart.

Success:

☐ Successful without assistance
☐ Completed with difficulty or help - Describe below
☐ Not completed

Comments:

Task Time: _____ Seconds

Optimal Path: History Form → Master Medication List

☐ Correct
☐ Minor Deviations - Describe below
☐ Major Deviations - Describe below

Comments:

Observed Errors and Verbalizations:

Comments:

Rating:

Overall, this task was: _____ "Very Easy" (1) to "Very Difficult" (5)

Task 38: Create Prescriptions

Transmit the prescription of Metolazone 30 mg capsules.

Success:

☐ Successful without assistance
☐ Completed with difficulty or help - Describe below
☐ Not completed

Comments:
Task Time: _____ Seconds
Optimal Path: Encounter Form → Print Window → Prescription Section → ERx Button
☐ Correct
☐ Minor Deviations - Describe below
☐ Major Deviations - Describe below
Comments:
Observed Errors and Verbalizations:
Comments:
Rating:
Overall, this task was: _____ "Very Easy" (1) to "Very Difficult" (5)

5.3 APPENDIX C
SYSTEM USABILITY SCALE QUESTIONNAIRE

Rate 1-5: Strongly Agree to Strongly Disagree

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

DISCLAIMER

Every effort has been made to make this report as complete and comprehensive as possible. If you still have questions or need further clarification on any aspect of the system or conducted tests, you can always contact us at support@unicharts.com and submit your queries. The usual response time is within 8 hours.

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