

EHR Usability Test Report

Product: ECLIPSE

Version: v1 Spectrum

The following study was developed using the NISTIR 7742 template as a guide for reporting our findings.

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

ECLIPSE v1 Spectrum

Dates of Usability Testing: December 8th, 15th & 18th 2017 & January 9th 12th 15th 17th & 2018

Date of Report: January 18, 2018

Report Prepared By: Galactek Corporation
John Waskowitz, Senior Vice-President
800.966.1462
johnw@galactek.com
15215 Technology Drive
Brooksville, FL 34604

Table of Contents

1 EXECUTIVE SUMMARY	2
2 INTRODUCTION	5
3 METHOD	6
3.1 PARTICIPANTS	6
3.2 STUDY DESIGN	7
3.3 TASKS	7
3.4 PROCEDURE	8
3.5 TEST LOCATION	8
3.6 TEST ENVIRONMENT	8
3.7 TEST FORMS AND TOOLS	9
3.8 PARTICIPANT INSTRUCTIONS	10
3.9 USABILITY METRICS	10
4 RESULTS	12
4.1 DATA ANALYSIS AND REPORTING	12
4.2 DISCUSSION OF THE FINDINGS	19
5 APPENDICES	20
5.1 APPENDIX 1: SAMPLE RECRUITING SCREENER	20
5.2 APPENDIX 2: PARTICIPANT DEMOGRAPHICS	22
5.3 APPENDIX 3: NON-DISCLOSURE AGREEMENT AND INFORMED CONSENT FORM	23
5.4 APPENDIX 4: EXAMPLE MODERATOR'S GUIDE	25
5.5 APPENDIX 5: SYSTEM USABILITY SCALE QUESTIONNAIRE	54
5.6 APPENDIX 6: INCENTIVE RECEIPT AND ACKNOWLEDGMENT FORM	55
5.7 APPENDIX 7: KEY PARTICIPANTS DEMOGRAPHICS	36

EXECUTIVE SUMMARY

Usability testing of ECLIPSE v1 Spectrum was conducted on December 8th, 15th, 18th 2017 & January 9th 12th 15th 17th 2018 at the following address: 15215 Technology Drive, Brooksville Florida by Galactek Corporation. 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, 2 healthcare providers and/or other intended users matching the target demographic criteria served as participants and used the EHRUT in simulated, but representative tasks.

This study collected performance data on 26 tasks typically conducted on an EHR:

- o § 170.315 (a)(1) Computerized provider order entry – medications
- o § 170.315 (a)(2) Computerized provider order entry – laboratory
- o § 170.315 (a)(3) Computerized provider order entry – diagnostic imaging
- o § 170.315 (a)(5) Demographics
- o § 170.315 (a)(6) Problem list
- o § 170.315 (a)(7) Medication list
- o § 170.315 (a)(8) Medication allergy list
- o § 170.315 (a)(9) Clinical decision support
- o § 170.315 (a)(14) Implantable device list
- o § 170.315 (b)(2) Clinical information reconciliation and incorporation

During the 60 minute one-on-one usability test, each participant was greeted by the administrator and asked to review and sign an informed consent/release form (included in Appendix 3); they were instructed that they could withdraw at any time. Participants had prior experience with the EHR. The administrator introduced the test, and instructed participants to complete a series of tasks (given one at a time) using the EHRUT. During the testing, the administrator timed the test and, along with the data logger recorded user performance data on paper and electronically. The administrator did not give the participant assistance in how to complete the task.

Participant screens and audio were recorded for subsequent analysis. 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 questionnaire and were not compensated for their time. Various recommended metrics, in accordance with the examples set forth in the *NIST Guide to the Processes Approach for Improving the Usability of Electronic Health Records*, were used to evaluate the usability of the EHRUT. Following is a summary of the performance and rating data collected on the EHRUT.

Measure/Task	Participants	Task Success	Path Deviation	Task Time	Errors	Task Rating 1= Very Easy
	#	Mean (SD)	Deviations (Observed / Optimal)	Mean (SD) & Deviations (Observed / Optimal)	Mean (SD)	Mean (SD)
CPOE – Medications (record)	10	100	0.0	140.1 sec.	0	1
CPOE – Medications (change)	10	100	0.0	73.0 sec.	0	1
CPOE – Medications (access)	10	100	0.0	20.3 sec.	0	1
CPOE Laboratory Orders (record)	10	100	0.0	112.0 sec.	0	1
CPOE Laboratory Orders (change)	10	100	0.0	62.5 sec.	0	1
CPOE Laboratory Orders (access)	10	100	0.0	15.9 sec.	0	1
CPOE Diagnostic Imaging (record)	10	100	0.0	102.6 sec.	0	1
CPOE Diagnostic Imaging (change)	10	100	0.0	50.5 sec.	0	1
CPOE Diagnostic Imaging (access)	10	100	0.0	14.5 sec.	0	1
Demographics (record)	10	100	0.0	149.7 sec.	0	1.1
Demographics (change)	10	100	0.0	115.0 sec.	0	1

Demographics (access)	10	100	0.0	19.5 sec.	0	1
Problem List (record)	10	100	0.0	98.0 sec.	0	1.1
Problem List (change)	10	100	0.0	31.6 sec.	0	1
Problem List (access)	10	100	0.0	13.7 sec.	0	1
Medication List (record)	10	100	0.0	132.6 sec.	0	1
Medication List (change)	10	100	0.0	62.8 sec.	0	1
Medication List (access)	10	100	0.0	18.5 sec.	0	1
Medication Allergy List (record)	10	100	0.0	88.3 sec.	0	1
Medication Allergy List (change)	10	100	0.0	30.8 sec.	0	1
Medication Allergy List (access)	10	100	0.0	16.2 sec.	0	1
Clinical Decision Support	10	100	0.0	16.9 sec.	0	1
Implantable Device List (record)	10	100	0.0	71.5 sec.	0	1
Implantable Device List (change)	10	100	0.0	40.3 sec.	0	1
Implantable Device List (access)	10	100	0.0	18.3 sec.	0	1
Clinical Information Reconciliation	10	100	0.0	49.8 sec.	0	1

The results from the SUS (System Usability Scale) scored the subjective satisfaction with the system based on performance with these tasks to be: 98.00.

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

- Major findings: Outstanding design provided users with easy work flow and navigation of the application.
- Areas for improvement: None

INTRODUCTION

The EHRUT tested for this study was ECLIPSE v1 Spectrum. This system is designed to represent a complete and comprehensive digital version of a patient's paper chart with real-time, patient-centered records. This system complies with all 2014 NIST certification criteria and is being submitted for verification of compliance with 2015 NIST certification criteria. The usability testing was conducted with every effort to represent realistic exercises and conditions.

The purpose of this study was to test and validate the usability of the current user interface, and provide evidence of usability in the EHR Under Test (EHRUT). To this end, measures of effectiveness, efficiency and user satisfaction, such as time to perform tasks; total number of deviations; total number of errors; etc., were captured during the usability testing.

METHOD

PARTICIPANTS

A total of 10 participants were tested on the EHRUT(s). Participants in the test were 2 Doctors of Chiropractic, 5 Office Managers, 1 Office Administrator, 1 Chiropractic Assistant, and 1 IT Administrator. Participants were recruited by Galactek Corp and were not compensated for their time. In addition, participants had no direct connection to the development of or organization producing the EHRUT(s). Participants were not from the testing or supplier organization. Participants were given the opportunity to have the same orientation and level of training as other end users would have received.

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

	Part ID	Gender	Age	Education	Occupation/ Role	Professional Experience	Computer Experience	Product Experience	Assistive Technology Needs
1.	A	F		High School	Office Manager	10 yrs	10 yrs	10 yrs	No
2.	B	F	60	Associates	Office Manager	20+ yrs	15 yrs	15 yrs	No
3.	C	F	47	Bachelors	Office Administrator	20 yrs	10 yrs	10 yrs	No
4.	D	F	50	Bachelors	Office Manager	20+ yrs	20+ yrs	20+ yrs	No
5.	E	M	61	Doctoral	Chiropractor	36 yrs	28 yrs	28 yrs	No
6.	F	F	59	Associates	Chiropractic Assistant	26 yrs	10 yrs	10 yrs	No
7.	G	M	47	High School	Office Manager	10 yrs	10 yrs	10 yrs	No
8.	H	F	58	Doctoral	Chiropractor	36 yrs	36 yrs	30+ yrs	No
9.	I	F	55	Bachelors	Office Manager	20 yrs	20 yrs	20 yrs	No
10.	J	M	55	Bachelors	IT Administrator	20+ yrs	20+ yrs	20 yrs	No

Ten participants (matching the demographics in the section on Participants) were recruited and ten participated in the usability test. Zero participants failed to show for the study.

Participants were scheduled for one 60 minute session with a minimum of more than 60 minutes in between each session for debrief by the administrator(s) and data logger(s), and to reset systems to proper test conditions. A spreadsheet was used to keep track of the participant schedule, and included each participant's demographic characteristics.

STUDY DESIGN

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

During the usability test, participants interacted with 1 EHR(s). Each participant used the system in the same location, and was provided with the same instructions. The system was evaluated for effectiveness, efficiency and satisfaction as defined by measures collected and analyzed for each participant:

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

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

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. CPOE for Medications 170.315(a)(1)
2. CPOE for Laboratory Orders 170.315(a)(2)
3. CPOE for Radiology Orders 170.315(a)(3)
4. Demographics 170.315(a)(5)
5. Problem List 170.315(a)(6)
6. Medication List 170.315(a)(7)
7. Medication Allergy List 170.315(a)(8)
8. Clinical Decision Support 170.315(a)(9)
9. Implantable Device List 170.315(a)(14)
10. Clinical Information Reconciliation 170.315(b)(2)

Tasks were selected based on their frequency of use, criticality of function, and those that may be most troublesome for users. Tasks should always be constructed in light of the study objectives.

PROCEDURES

Upon commencement of the test, participants were greeted, remotely logged in, and their identity was verified and matched with a name on the participant schedule. Participants were then assigned a participant ID. Each participant reviewed and signed an informed consent and release form prior to testing.

To ensure that the test ran smoothly, two staff members participated in this test, the usability administrator and the data logger. The administrator moderated the session including administering instructions and tasks. The administrator also monitored task times, obtained post-task rating data, and took notes on participant comments. A second person served as the data logger and took notes on task success, path deviations, number and type of errors, and comments.

Participants were instructed to perform the tasks:

- 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.

For each task, the participants were given a written copy of the task. Task timing began once the administrator finished reading the question. The task time was stopped once the participant indicated they had successfully completed the task.

Following the session, the administrator gave the participant the post-test questionnaire (e.g., the System Usability Scale), and thanked each individual for their participation.

Participants' demographic information, task success rate, time on task, errors, deviations, verbal responses, and post-test questionnaire were recorded into a spreadsheet. Participants were thanked for their time.

TEST LOCATION

The tests were performed in the conference room of the Galactek Corp office building located @ 15215 Technology Drive, Brooksville Florida 34604. The test was administered in a remote setting where participants were isolated from other participants in the study. Only the test administrator and logger were on the call with the participants while the study was being administered.

TEST ENVIRONMENT

The computers used for the testing were PCs running on Windows 7. Users also used a mouse and keyboard while interacting with the EHR. The ECLIPSE application is a primarily client-server solution with some web components; and all computers were running on high speed internet connections. All participants indicated that system performance during the test was what they were used to seeing during their typical work day.

TEST FORMS AND TOOLS

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

1. Informed Consent
2. Moderator's Guide
3. Post-test Questionnaire
4. Incentive Receipt and Acknowledgment Form

Examples of these documents can be found in Appendices 3-6 respectively. The Moderator's Guide was devised so as to be able to capture required data.

The participant's interaction with the EHRUT was captured and recorded digitally with screen capture software running on the test machine. Camtasia recording software was used to record each participant's steps and verbal comments while performing the requested functions.

PARTICIPANT INSTRUCTIONS

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

Thank you for participating in this study. Your input is very important. Our session today will last about 60 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. I did not have any involvement in its creation, so please be honest with your opinions. All of the information that you provide will be kept confidential and your name will not be associated with your comments at any time. Should you feel it necessary you are able to withdraw at any time during the testing.

Following the procedural instructions, participants were shown the EHR and as their first task, were given time 2 minutes to explore the system and make comments. Once this task was complete, the administrator gave the following instructions:

For each task, I will read the description to you and say "Begin." At that point, please perform the task and say "Done" once you believe you have successfully completed the task. I would like to request that you not talk aloud or verbalize while you are doing the tasks. I will ask you your impressions about the task once you are done

Participants were then given 26 tasks to complete.

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

DATA SCORING

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

Measures	Rationale and Scoring
<p>Effectiveness:</p> <p>Task Success</p>	<p>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.</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. Observed task times divided by the optimal time for each task is a measure of optimal efficiency.</p>
<p>Effectiveness:</p> <p>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 an “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. Not all deviations would be counted as errors. This should also be expressed as the mean number of failed tasks per participant. On a qualitative level, an enumeration of errors and error types should be collected.</p>
<p>Efficiency:</p> <p>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. 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</p>
<p>Efficiency:</p> <p>Task Time</p>	<p>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.</p>
<p>Satisfaction:</p> <p>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. ¹²</p> <p>Common convention is that average ratings for systems judged easy to use should be 3.3 or above.</p> <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.”</p>

RESULTS

DATA ANALYSIS AND REPORTING

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

The usability testing results for the EHRUT are detailed below. The results should be seen in light of the objectives and goals outlined in Section 3.2 Study Design. The data should yield actionable results that, if corrected, yield material, positive impact on user performance.

Measure/Task	Participants	Task Success	Path Deviation	Task Time	Errors	Task Rating 1= Very Easy
	#	Mean (SD)	Deviations (Observed / Optimal)	Mean (SD) & Deviations (Observed / Optimal)	Mean (SD)	Mean (SD)
CPOE – Medications (record)	10	100	0.0	140.1 sec.	0	1
CPOE – Medications (change)	10	100	0.0	73.0 sec.	0	1
CPOE – Medications (access)	10	100	0.0	20.3 sec.	0	1
CPOE Laboratory Orders (record)	10	100	0.0	112.0 sec.	0	1
CPOE Laboratory Orders (change)	10	100	0.0	62.5 sec.	0	1
CPOE Laboratory Orders (access)	10	100	0.0	15.9 sec.	0	1
CPOE Diagnostic Imaging (record)	10	100	0.0	102.6 sec.	0	1
CPOE Diagnostic Imaging (change)	10	100	0.0	50.5 sec.	0	1
CPOE Diagnostic Imaging (access)	10	100	0.0	14.5 sec.	0	1
Demographics (record)	10	100	0.0	149.7 sec.	0	1.1

Demographics (change)	10	100	0.0	115.0 sec.	0	1
Demographics (access)	10	100	0.0	19.5 sec.	0	1
Problem List (record)	10	100	0.0	98.0 sec.	0	1.1
Problem List (change)	10	100	0.0	31.6 sec.	0	1
Problem List (access)	10	100	0.0	13.7 sec.	0	1
Medication List (record)	10	100	0.0	132.6 sec.	0	1
Medication List (change)	10	100	0.0	62.8 sec.	0	1
Medication List (access)	10	100	0.0	18.5 sec.	0	1
Medication Allergy List (record)	10	100	0.0	88.3 sec.	0	1
Medication Allergy List (change)	10	100	0.0	30.8 sec.	0	1
Medication Allergy List (access)	10	100	0.0	16.2 sec.	0	1
Clinical Decision Support	10	100	0.0	16.9 sec.	0	1
Implantable Device List (record)	10	100	0.0	71.5 sec.	0	1
Implantable Device List (change)	10	100	0.0	40.3 sec.	0	1
Implantable Device List (access)	10	100	0.0	18.3 sec.	0	1
Clinical Information Reconciliation	10	100	0.0	49.8 sec.	0	1

The results from the SUS (System Usability Scale) scored the subjective satisfaction with the system based on performance with these tasks to be: 98.00. Broadly interpreted, scores under 60 represent systems with poor usability; scores over 80 would be considered above average.

Effectiveness

Participants in the study experienced no errors or path deviations in the execution of the tasks

Measure/Task	Participants	Success	Success %	Failures	Failure %	Failed Tasks per Participant
CPOE – Medications (record)	10	10	100	0	0	0
CPOE – Medications (change)	10	10	100	0	0	0
CPOE – Medications (access)	10	10	100	0	0	0
CPOE Laboratory Orders (record)	10	10	100	0	0	0
CPOE Laboratory Orders (change)	10	10	100	0	0	0
CPOE Laboratory Orders (access)	10	10	100	0	0	0
CPOE Diagnostic Imaging (record)	10	10	100	0	0	0
CPOE Diagnostic Imaging (change)	10	10	100	0	0	0
CPOE Diagnostic Imaging (access)	10	10	100	0	0	0
Demographics (record)	10	10	100	0	0	0
Demographics (change)	10	10	100	0	0	0
Demographics (access)	10	10	100	0	0	0
Problem List (record)	10	10	100	0	0	0
Problem List (change)	10	10	100	0	0	0

Problem List (access)	10	10	100	0	0	0
Medication List (record)	10	10	100	0	0	0
Medication List (change)	10	10	100	0	0	0
Medication List (access)	10	10	100	0	0	0
Medication Allergy List (record)	10	10	100	0	0	0
Medication Allergy List (change)	10	10	100	0	0	0
Medication Allergy List (access)	10	10	100	0	0	0
Clinical Decision Support	10	10	100	0	0	0
Implantable Device List (record)	10	10	100	0	0	0
Implantable Device List (change)	10	10	100	0	0	0
Implantable Device List (access)	10	10	100	0	0	0
Clinical Information Reconciliation	10	10	100	0	0	0

Efficiency

Measure/Task	Participants	Optimal Task Time (sec)	Target Task Time	Avg.Task Time	Standard Deviation	Standard Error	Observed Task Time / Optimal Task Time
CPOE – Medications (record)	10	90 sec	135 sec	140.1 sec.	33.15	10.48	1.56
CPOE – Medications (change)	10	60 sec	75 sec	73.0 sec.	15.81	5.0	1.22
CPOE – Medications (access)	10	10 sec	15 sec	20.3 sec.	11.88	3.76	2.03
CPOE Laboratory Orders (record)	10	79 sec	119 sec	112.0 sec.	24.50	7.75	1.42
CPOE Laboratory Orders (change)	10	45 sec	68 sec	62.5 sec.	20.96	6.63	1.39
CPOE Laboratory Orders (access)	10	9 sec	14 sec	15.9 sec.	5.17	1.64	1.76
CPOE Diagnostic Imaging (record)	10	74 sec	111 sec	102.6 sec.	17.99	5.38	1.39
CPOE Diagnostic Imaging (change)	10	34 sec	51 sec	50.5 sec.	18.44	5.83	1.48
CPOE Diagnostic Imaging (access)	10	10 sec	15 sec	14.5 sec.	3.40	1.08	1.45
Demographics (record)	10	97 sec	146 sec	149.7 sec.	38.87	12.29	1.54
Demographics (change)	10	92 sec	138 sec	115.0 sec.	32.96	10.42	1.25

Demographics (access)	10	14 sec	21 sec	19.5 sec.	3.75	1.19	1.39
Problem List (record)	10	66 sec	99 sec	98.0 sec.	30.14	9.53	1.48
Problem List (change)	10	20 sec	30 sec	31.6 sec.	9.19	2.91	1.58
Problem List (access)	10	10 sec	15 sec	13.7 sec.	2.45	0.78	1.37
Medication List (record)	10	95 sec	143 sec	132.6 sec.	29.79	9.42	1.40
Medication List (change)	10	46 sec	69 sec	62.8 sec.	15.26	4.83	1.37
Medication List (access)	10	13 sec	20 sec	18.5 sec.	7.70	1.49	1.42
Medication Allergy List (record)	10	60 sec	90 sec	88.3 sec.	23.05	7.29	1.47
Medication Allergy List (change)	10	22 sec	33 sec	30.8 sec.	6.63	2.09	1.40
Medication Allergy List (access)	10	11 sec	17 sec	16.2 sec.	3.74	1.81	1.47
Clinical Decision Support	10	11 sec	17 sec	16.9 sec.	3.84	1.22	1.54
Implantable Device List (record)	10	46 sec	69 sec	71.5 sec.	20.91	6.61	1.55
Implantable Device List (change)	10	26 sec	39 sec	40.3 sec.	18.60	5.88	1.55
Implantable Device List (access)	10	15 sec	23 sec	18.3 sec.	3.23	1.02	1.22
Clinical Information Reconciliation	10	22 sec	33 sec	49.8 sec.	20.08	7.92	2.26

Participants in the study followed the optimal paths to complete the assigned tasks.

Satisfaction

Measure/Task	Participants	Average Satisfaction Rating on 1-5 Scale (1=Very Easy)
CPOE – Medications (record)	10	1
CPOE – Medications (change)	10	1
CPOE – Medications (access)	10	1
Laboratory Orders (record)	10	1
CPOE Laboratory Orders (change)	10	1
CPOE Laboratory Orders (access)	10	1
CPOE Diagnostic Imaging (record)	10	1
CPOE Diagnostic Imaging (change)	10	1
CPOE Diagnostic Imaging (access)	10	1
Demographics (record)	10	1.1
Demographics (change)	10	1
Demographics (access)	10	1
Problem List (record)	10	1.1
Problem List (change)	10	1

Problem List (access)	10	1
Medication List (record)	10	1
Medication List (change)	10	1
Medication List (access)	10	1
Medication Allergy List (record)	10	1
Medication Allergy List (change)	10	1
Medication Allergy List (access)	10	1
Clinical Decision Support	10	1
Implantable Device List (record)	10	1
Implantable Device List (change)	10	1
Implantable Device List (access)	10	1
Clinical Information Reconciliation	10	1

10 out of 10 users expressed they were “Very Satisfied” with ECLIPSE.

Major Findings

The study showed no major findings. Overall, the participants are very satisfied with the system. Their use of the system has not decreased over time; and all participants feel the functionality allows them to execute their job functions without requiring them to perform additional unnecessary tasks.

Areas for Improvement

The study showed no areas for improvement. Overall, the participants are very satisfied with the system

APPENDIX:

RECRUITING SCREENER

The purpose of a screener to ensure that the participants selected represent the target user population as closely as possible. (Portions of this sample screener are taken from www.usability.gov/templates/index.html#Usability and adapted for use.)

Recruiting Script for Recruiting Firm

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

Customize this by dropping or adding questions so that it reflects your EHR's primary audience

1. [If not obvious] Are you male or female? [Recruit a mix of participants]
2. Have you participated in a focus group or usability test in the past xx months? [If yes, Terminate]
3. Do you, or does anyone in your home, work in marketing research, usability research, web design [...etc.]? [If yes, Terminate]
4. Do you, or does anyone in your home, have a commercial or research interest in an electronic health record software or consulting company? [If yes, Terminate]
5. Which of the following best describes your age? [23 to 39; 40 to 59; 60 - to 74; 75 and older] [Recruit Mix]
6. Which of the following best describes your race or ethnic group? [e.g., Caucasian, Asian, Black/African-American, Latino/a or Hispanic, etc.]
7. Do you require any assistive technologies to use a computer? [if so, please describe]

Professional Demographics

8. What is your current position and title? (Must be healthcare provider)

- RN: Specialty _____
- Physician: Specialty _____
- Resident: Specialty _____
- Administrative Staff
- Other [Terminate]

9. How long have you held this position?

10. Describe your work location (or affiliation) and environment? (Recruit according to the intended users of the application) [e.g., private practice, health system, government clinic, etc.]

11. Which of the following describes your highest level of education? [e.g., high school graduate/GED, some college, college graduate (RN, BSN), postgraduate (MD/PhD), other (explain)]

Computer Expertise *Customize this to reflect what you know about your EHR's audience*

12. Besides reading email, what professional activities do you do on the computer? [e.g., access EHR, research; reading news; shopping/banking; digital pictures; programming/word processing, etc.] [If no computer use at all, Terminate]

13. About how many hours per week do you spend on the computer? [Recruit according to the demographics of the intended users, e.g., 0 to 10, 11 to 25, 26+ hours per week]

14. What computer platform do you usually use? [e.g., Mac, Windows, etc.]

15. What Internet browser(s) do you usually use? [e.g., Firefox, IE, AOL, etc.]

16. In the last month, how often have you used an electronic health record?

17. How many years have you used an electronic health record?

18. How many EHRs do you use or are you familiar with?

19. How does your work environment patient records? [Recruit according to the demographics of the intended users]

On paper

Some paper, some electronic

All electronic

Contact Information

If the person matches your qualifications, ask

Those are all the questions I have for you. Your background matches the people we're looking for.

Would you be able to participate on [date, time]? [If so collect contact information]

May I get your contact information?

Name of participant:

Address:

City, State, Zip:

Daytime phone number:

Evening phone number:

Alternate [cell] phone number:

Email address:

Before your session starts, we will ask you to sign a release form allowing us to videotape your session. The videotape will only be used internally for further study if needed. Will you consent to be videotaped?

This study will take place through an on-line meeting. I will confirm your appointment a couple of days before your session. What time is the best time to reach you?

PARTICIPANT DEMOGRAPHICS

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

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

Gender

Men	[X]
Women	[X]
Total (participants)	[X]

Occupation/Role

Physician	[X]
Admin Staff	[X]
Total (participants)	[X]

Years Experience

Years experience	[X]
Facility Use of EHR	
All Paper	[X]
Some paper, some electronic	[X]
All electronic	[X]

As an appendix to the report, the full participant breakdown (de-identified) is included.

The full participant breakdown (de-identified) can be found in Section 5.7 KEY PARTICIPANTS DEMOGRAPHICS

Non-Disclosure Agreement

THIS AGREEMENT is entered into as of December , 2017 , between _____ (“the Participant”) and the testing organization *Galactek Corp* located at 15215 Technology Drive, Brooksville FL 34604

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

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

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

Participant’s printed name: _____

Signature: _____ **Date:** _____

Informed Consent

Galactek Corp. would like to thank you for participating in this study. The purpose of this study is to evaluate an electronic health records system. If you decide to participate, you will be asked to perform several tasks using the prototype and give your feedback. The study will last about 60 minutes.

Agreement

I understand and agree that as a voluntary participant in the present study conducted by *Galactek Corp.* I am free to withdraw consent or discontinue participation at any time. I understand and agree to participate in the study conducted and videotaped by the *Galactek Corp.*

I understand and consent to the use and release of the videotape by *Galactek Corp.* 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 *Galactek Corp.* 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 outside of *Galactek Corp.* and *Galactek Corp.* client. I understand and agree that data confidentiality is assured, because only de-identified data – i.e., identification numbers not names – will be used in analysis and reporting of the results.

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

Please check one of the following:

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

Signature: _____ **Date:** _____

EXAMPLE MODERATOR'S GUIDE

***EHRUT* Usability Test**

Moderator's Guide

Administrator John Waskowitz

Data Logger Matt Leach

Date _____ **Time** _____

Participant # _____

Location _____

Prior to testing

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

Prior to each participant:

- Reset application
- Start session recordings with *tool*

Prior to each task:

- Reset application to starting point for next task

After each participant:

- End session recordings with *tool*

After all testing

- Back up all video and data files

Orientation (5 minutes)

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

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

I did not have any involvement in its creation, so please be honest with your opinions.

The product you will be using today is *ECLIPSE v1 Spectrum*. Some of the data may not make sense as it is placeholder data.

We are recording the audio and screenshots of our session today. All of the information that you provide will be kept confidential and your name will not be associated with your comments at any time.

Do you have any questions or concerns?

Preliminary Questions (90 seconds)

What is your job title / appointment?

How long have you been working in this role?

What are some of your main responsibilities?

Tell me about your experience with electronic health records.

Task 1: First Impressions (90 Seconds)

This is the application you will be working with. Have you heard of it? ____ Yes ____ No
If so, tell me what you know about it.

- Show test participant the EHRUT.*
- Please don't click on anything just yet. What do you notice? What are you able to do here? Please be specific.

Add Notes / Comments:

Task 2: Add a Medication Order (180 Seconds)

Take the participant to the starting point for the task.

The *Patient* presented a newly prescribed medication for Coumadin. Record this medication.

Success:

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

Comments:

Task Time: _____ Seconds

Optimal Path:

- 1) From the rolodex open a patient record
- 2) Click on the **EHR Tab**
- 3) Click the sub-tab of **Orders**
- 4) Click **New** to create a new Rx
- 5) Click RxNorm Lookup
- 6) Enter medication
- 7) Enter any additional Rx information
- 8) Click OK

- 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 Easy” (1) to “Very Difficult” (5)

1	2	3	4	5
---	---	---	---	---

Administrator / Notetaker Comments:

Task 3: Change a Medication Order (120 Seconds)

Take the participant to the starting point for the task.

The patients' previous medication order for Coumadin needs to be modified. Please change strength, quantity, and refills.

Success:

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

Comments:

Task Time: _____ Seconds

Optimal Path:

- 1) From the rolodex open a patient record
- 2) Click on the **EHR Tab**
- 3) Click the sub-tab of **Orders**
- 4) Right click on the Rx order and select Edit
- 5) Click **RxNorm Lookup**
- 6) Enter medication
- 7) Enter any additional Rx information
- 8) Click OK

- 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 Easy” (1) to “Very Difficult” (5)

1	2	3	4	5
---	---	---	---	---

Administrator / Notetaker Comments:

Task 4: View a Medication Order (45 Seconds)

View a patients medication orders

Success:

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

Comments:

Task Time: _____ Seconds

Optimal Path:

- 1) From the rolodex open a patient record
- 2) Click on the **EHR Tab**
- 3) Click the sub-tab of **Orders**

- 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 Easy” (1)

to

“Very Difficult” (5)

1	2	3	4	5
---	---	---	---	---

Administrator / Notetaker Comments:

Task 5: Add a Laboratory Order (180 Seconds)

Take the participant to the starting point for the task.

Enter a new Laboratory Order into the patient's record for a CBC.

Success:

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

Comments:

Task Time: _____ Seconds

Optimal Path:

- 1) From the rolodex open a patient record
- 2) Click on the **EHR Tab**
- 3) Click the sub-tab of **Orders**
- 4) Click **New** to create a new Lab Order
- 5) Click LOINC Test Lookup
- 6) Enter CBC
- 7) Enter any additional order information
- 8) Click OK

- 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 Easy” (1) to “Very Difficult” (5)

1	2	3	4	5
---	---	---	---	---

Administrator / Notetaker Comments:

Task 6: Change a Laboratory Order (120Seconds)

Take the participant to the starting point for the task.

A laboratory order previously entered for a CBC must be changed. Modify the priority, fasting, and current status.

Success:

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

Comments:

Task Time: _____ Seconds

Optimal Path:

- 1) From the rolodex open a patient record
- 2) Click on the **EHR Tab**
- 3) Click the sub-tab of **Orders**
- 4) Right click on the laboratory order and select Edit
- 5) Modify the laboratory order
- 6) Click OK

- 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 Easy” (1) to “Very Difficult” (5)

1	2	3	4	5
---	---	---	---	---

Administrator / Notetaker Comments:

Task 7: View a Laboratory Order (45 Seconds)

Take the participant to the starting point for the task.

View a patients laboratory orders

Success:

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

Comments:

Task Time: _____ Seconds

Optimal Path:

- 1) From the rolodex open a patient record
- 2) Click on the **EHR Tab**
- 3) Click the sub-tab of **Orders**

- 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 Easy” (1) to “Very Difficult” (5)

1	2	3	4	5
---	---	---	---	---

Administrator / Notetaker Comments:

Task 8: Add a Diagnostic Order (180 Seconds)

Take the participant to the starting point for the task.

Enter a new Diagnostic Order into a patient's record. Order the patient an X-ray Cervical 2 view.

Success:

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

Comments:

Task Time: _____ Seconds

Optimal Path:

- 1) From the rolodex open a patient record
- 2) Click on the **EHR Tab**
- 3) Click the sub-tab of **Orders**
- 4) Click **New** to create a new Radiology Order
- 5) Enter the order information
- 6) Enter the reason for order
- 7) Click OK

- 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 Easy” (1) to “Very Difficult” (5)

1	2	3	4	5
---	---	---	---	---

Administrator / Notetaker Comments:

Task 9: Change a Diagnostic Order (120 Seconds)

Take the participant to the starting point for the task.

A laboratory order previously entered for an x-ray cervical 2 view must be changed. Modify the priority and fasting.

Success:

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

Comments:

Task Time: _____ Seconds

Optimal Path:

- 1) From the rolodex open a patient record
- 2) Click on the **EHR Tab**
- 3) Click the sub-tab of **Orders**
- 4) Right click on the diagnostic order and select Edit
- 5) Modify the diagnostic order
- 6) Click OK

- 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 Easy” (1) to “Very Difficult” (5)

1	2	3	4	5
---	---	---	---	---

Administrator / Notetaker Comments:

Task 10: View a Diagnostic Order (45 Seconds)

Take the participant to the starting point for the task.

View the Diagnostic Order in a patient's record.

Success:

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

Comments:

Task Time: _____ Seconds

Optimal Path:

- 1) From the rolodex open a patient record
- 2) Click on the **EHR Tab**
- 3) Click the sub-tab of **Orders**

- 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 Easy” (1) to “Very Difficult” (5)

1	2	3	4	5
---	---	---	---	---

Administrator / Notetaker Comments:

Task 11: Record Demographics (240 Seconds)

Take the participant to the starting point for the task.

Record patient demographics in an established patient record. Please include gender, language, race, ethnicity, date of birth, sexual orientation, and gender identity.

Success:

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

Comments:

Task Time: _____ Seconds

Optimal Path:

- 1) From the rolodex open a patient record
- 2) From Personal tab add Gender, Language, Race, Ethnicity, & Date of Birth
- 3) Go to EHR tab, History tab, Social History tab
- 4) Click New
- 5) Select Sexual Orientation & Gender Identity
- 6) Save Changes
- 7) Exit the record and save changes

- 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 Easy” (1) to “Very Difficult” (5)

1	2	3	4	5
---	---	---	---	---

Administrator / Notetaker Comments:

Task 12: Change Demographics (240 Seconds)

Take the participant to the starting point for the task.

Change patient demographics in an established patient record. Update gender, language, race, ethnicity, date of birth, sexual orientation, and gender identity.

Success:

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

Comments:

Task Time: _____ Seconds

Optimal Path:

- 1) From the rolodex open a patient record
- 2) From Personal tab change Gender, Language, Race, Ethnicity, & Date of Birth
- 3) Go to EHR tab, History tab, Social History tab
- 4) Change Sexual Orientation & Gender Identity
- 5) Save Changes
- 6) Exit the record and save changes

- 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 Easy” (1) to “Very Difficult” (5)

1	2	3	4	5
---	---	---	---	---

Administrator / Notetaker Comments:

Task 13: View Demographics (45 Seconds)

Take the participant to the starting point for the task.

View patient demographics in an established patient record.

Success:

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

Comments:

Task Time: _____ Seconds

Optimal Path:

- 1) From the rolodex open a patient record
- 2) Personal tab view Gender, Language, Race, Ethnicity, & Date of Birth
- 3) Go to EHR tab, History tab, Social History tab
- 4) View Sexual Orientation & Gender Identity

- 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 Easy” (1) to “Very Difficult” (5)

1	2	3	4	5
---	---	---	---	---

Administrator / Notetaker Comments:

Task 14: Record Problem List (180 Seconds)

Take the participant to the starting point for the task.

Record hypertension in an established patient record.

Success:

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

Comments:

Task Time: _____ Seconds

Optimal Path:

- 1) From the rolodex open a patient record
- 2) Go to EHR tab, History tab, Problem tab
- 3) Click New
- 4) Enter Problem information
- 5) Click SNOMED to select SNOMED code
- 6) Save Changes

- 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 Easy” (1)

to

“Very Difficult” (5)

1	2	3	4	5
---	---	---	---	---

Administrator / Notetaker Comments:

Task 15: Change Problem List (60 Seconds)

Take the participant to the starting point for the task.

Modify the Hypertension onset date in an established patient record.

Success:

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

Comments:

Task Time: _____ Seconds

Optimal Path:

- 1) From the rolodex open a patient record
- 2) Go to EHR tab, History tab, Problem tab
- 3) Change Onset Date
- 4) Save Changes

- 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 Easy” (1) to “Very Difficult” (5)

1	2	3	4	5
---	---	---	---	---

Administrator / Notetaker Comments:

Task 16: View Problem List (45 Seconds)

Take the participant to the starting point for the task.

View the problem list in an established patient record.

Success:

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

Comments:

Task Time: _____ Seconds

Optimal Path:

- 1) From the rolodex open a patient record
- 2) Go to EHR tab
- 3) History tab
- 4) Problem tab

- 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 Easy” (1)

to

“Very Difficult” (5)

1	2	3	4	5
---	---	---	---	---

Administrator / Notetaker Comments:

Task 17: Record Medication (240 Seconds)

Take the participant to the starting point for the task.

The patient presented a new medication for Coumadin. Enter this medication.

Success:

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

Comments:

Task Time: _____ Seconds

Optimal Path:

- 1) From the rolodex open a patient record
- 2) Click on the **EHR Tab**
- 3) Click the sub-tab of **History**
- 4) Click on the tab **Medications**
- 5) Click **New** at the bottom of the screen
- 6) Click RxNorm
- 7) Type in a Medication
- 8) Select Route, Frequency and Duration
- 9) Type Quality & Refills
- 10) Click Save Changes

- 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 Easy” (1) to “Very Difficult” (5)

1	2	3	4	5
---	---	---	---	---

Administrator / Notetaker Comments:

Task 18: Change Medication (120 Seconds)

Take the participant to the starting point for the task.

The patient presented a change to their prescribed medication. Add this information.

Success:

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

Comments:

Task Time: _____ Seconds

Optimal Path:

- 1) From the rolodex open a patient record
- 2) Click on the **EHR Tab**
- 3) Click the sub-tab of **History**
- 4) Click on the tab **Medications**
- 5) Change Duration, Quantity, and Refills
- 6) Click Save Changes

- 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 Easy” (1)

to

“Very Difficult” (5)

1	2	3	4	5
---	---	---	---	---

Administrator / Notetaker Comments:

Task 19: View Medication (45 Seconds)

Take the participant to the starting point for the task.

View currently prescribed medications for a patient.

Success:

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

Comments:

Task Time: _____ Seconds

Optimal Path:

- 1) From the rolodex open a patient record
- 2) Click on the **EHR Tab**
- 3) Click the sub-tab of **History**
- 4) Click on the tab **Medications**

- 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 Easy” (1) to “Very Difficult” (5)

1	2	3	4	5
---	---	---	---	---

Administrator / Notetaker Comments:

Task 20: Record Medication Allergy (180 Seconds)

Take the participant to the starting point for the task.

The patient presented a new medication allergy towards Penicillin. Add this information.

Success:

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

Comments:

Task Time: _____ Seconds

Optimal Path:

1. From the rolodex open a patient record
2. Click on the **EHR Tab**
3. Click the sub-tab of **History**
4. Click on the tab **Allergies**
5. Click **New** at the bottom of the screen
6. Select an Allergy
7. Type in a Reaction
8. Select a Severity
9. Enter an Adverse Event Date
10. Click Save Changes

- 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 Easy” (1)

to

“Very Difficult” (5)

1	2	3	4	5
---	---	---	---	---

Administrator / Notetaker Comments:

Task 21: Change Medication Allergy List (90 Seconds)

Take the participant to the starting point for the task.

The patient presents a change to their medication allergy for Penicillin. Update this information.

Success:

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

Comments:

Task Time: _____ Seconds

Optimal Path:

- 1) From the rolodex open a patient record
- 2) Click on the **EHR Tab**
- 3) Click the sub-tab of **History**
- 4) Click on the tab **Allergies**
- 5) Change the Severity from Mild to Moderate
- 6) Click Save Changes

- 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 Easy” (1) to “Very Difficult” (5)

1	2	3	4	5
---	---	---	---	---

Administrator / Notetaker Comments:

Task 22: Access Medication Allergy List (45 Seconds)

Take the participant to the starting point for the task.

Before going into the exam room and you want to review *Patient's medication allergy list*. Find this information.

Success:

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

Comments:

Task Time: _____ Seconds

Optimal Path:

- 1) From the rolodex open a patient record
- 2) Click on the **EHR Tab**
- 3) Click the sub-tab of **History**
- 4) Click on the tab **Allergies**

- 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 Easy” (1) to “Very Difficult” (5)

1	2	3	4	5
---	---	---	---	---

Administrator / Notetaker Comments:

Task 23: Clinical Decision Support (30 Seconds)

Take the participant to the starting point for the task.

How would you receive Clinical Decision Support from within a patient record?

Success:

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

Comments:

Task Time: _____ Seconds

Optimal Path:

- 1) From the rolodex open a patient record
- 2) Click on the **EHR Tab**

- 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 Easy” (1) to “Very Difficult” (5)

1	2	3	4	5
---	---	---	---	---

Administrator / Notetaker Comments:

Task 24: Implantable Device List (120 Seconds)

Take the participant to the starting point for the task.

The patient presented that they have an implantable device. Add this information.

Success:

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

Comments:

Task Time: _____ Seconds

Optimal Path:

- 1) From the rolodex open a patient record
- 2) Click on the **EHR Tab**
- 3) Click the sub-tab of **History**
- 4) Click on the tab **Implantable Devices**
- 5) Click **New** at the bottom of the screen
- 6) Enter UDI information
- 7) Click on **UDI Lookup**
- 8) Click **Close**
- 9) **Status** - change to **Active**
- 10) Click **Save Change**

- 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 Easy” (1) to “Very Difficult” (5)

1	2	3	4	5
---	---	---	---	---

Administrator / Notetaker Comments:

Task 25: Implantable Device List (90 Seconds)

Take the participant to the starting point for the task.

The patient presented a change to the implantable device. Update the status to inactive.

Success:

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

Comments:

Task Time: _____ Seconds

Optimal Path:

- 1) From the rolodex open a patient record
- 2) Click on the **EHR Tab**
- 3) Click the sub-tab of **History**
- 4) Click on the tab **Implantable Devices**
- 5) **Status** - change from Active to **Inactive**
- 6) Click **Save Changes**

- 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 Easy” (1) to “Very Difficult” (5)

1	2	3	4	5
---	---	---	---	---

Administrator / Notetaker Comments:

Task 26: Implantable Device List (30 Seconds)

Take the participant to the starting point for the task.

A provider wants to review a patient chart to see if the patient has an implantable device. View this information.

Success:

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

Comments:

Task Time: _____ Seconds

Optimal Path:

- 1) From the rolodex open a patient record
- 2) Click on the **EHR Tab**
- 3) Click the sub-tab of **History**
- 4) Click on the tab **Implantable Devices**

- 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 Easy” (1) to “Very Difficult” (5)

1	2	3	4	5
---	---	---	---	---

Administrator / Notetaker Comments:

Task 27: Clinical Information Reconciliation and Incorporation (120 Seconds)

Take the participant to the starting point for the task.

How would you perform a medication reconciliation inside a patient record?

Success:

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

Comments:

Task Time: _____ Seconds

Optimal Path:

- 1) From the rolodex open a patient record
- 2) Click on the **EHR Tab**
- 3) Click on the **History Tab**
- 4) Click on the **Medications Tab**
- 5) Right click on medication and select **Reconcile Selected Items**
- 6) Click **Yes** to reconcile selected items. Are you sure?
- 7) Click Save Changes

- 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 Easy” (1)

to

“Very Difficult” (5)

1	2	3	4	5
---	---	---	---	---

Administrator / Notetaker Comments:

Final Questions (*X Minutes*)

What was your overall impression of this system?

What aspects of the system did you like most?

What aspects of the system did you like least?

Were there any features that you were surprised to see?

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

Compare this system to other systems you have used.

Would you recommend this system to your colleagues?

Administer the SUS

SYSTEM USABILITY SCALE QUESTIONNAIRE

In 1996, Brooke published a “low-cost usability scale that can be used for global assessments of systems usability” known as the System Usability Scale or SUS. <http://www.usabilitynet.org/trump/documents/Suschapt.doc> or in Tullis and Albert (2008). Lewis and Sauro (2009) and others have elaborated on the SUS over the years. Computation of the SUS score can be found in Brooke’s paper, in at <http://usabilitynet.org/trump/documents/Suschapt.doc> or in Tullis and Albert (2008)

1. I think that I would like to use this system frequently

Strongly disagree

Strongly Agree

1	2	3	4	5
---	---	---	---	---

2. I found the system unnecessarily complex

1	2	3	4	5
---	---	---	---	---

3. I thought the system was easy to use

1	2	3	4	5
---	---	---	---	---

4. I think that I would need the support of a technical person to be able to use this system

1	2	3	4	5
---	---	---	---	---

5. I found the various functions in this system were well integrated

1	2	3	4	5
---	---	---	---	---

6. I thought there was too much inconsistency in this system

1	2	3	4	5
---	---	---	---	---

7. I would imagine that most people would learn to use this system very quickly

1	2	3	4	5
---	---	---	---	---

8. I found the system very cumbersome to use

1	2	3	4	5
---	---	---	---	---

9. I felt very confident using the system

1	2	3	4	5
---	---	---	---	---

10. I needed to learn a lot of things before I could get going with this system

1	2	3	4	5
---	---	---	---	---

Acknowledgement of Receipt

I hereby acknowledge receipt of \$ _____ for my participation in a research study run by *Galactek Corp.*

Printed Name: _____

Address: _____

Signature: _____ Date: _____

Usability Researcher: _____

Signature of Usability Researcher: _____

Date: _____

Witness: _____

Witness Signature: _____

Date: _____

PARTICIPANT DEMOGRAPHICS

The report should contain a breakdown of the key participant demographics.

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

Gender

Men	[3]
Women	[7]
Total (participants)	[10]

Occupation/Role

Physician	[2]
Office Manager	[6]
Admin Staff	[1]
IT Administrator	[1]
Total (participants)	[10]

Years of Experience

Years experience	[10,15,10,20+, 28,10, 30+,20, 20+]
------------------	------------------------------------

Facility Use of EHR

All Paper	[0]
Some paper, some electronic	[0]
All electronic	[10]
Total (participants)	[10]