EHR Usability Test Report of Novoclinical 1.0

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

Novoclinical 1.0

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1. EXECUTIVE SUMMARY

A usability test of Novoclinical, 1.0 (Clinical Practice Management EHR) was conducted on 11/06/2017 in Ogden by Novomedici Quality Assurance Team. 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). Novoclinical uses NISTIR 7741 for the user-centered design implementation of the EHR.

During the usability test, 4 healthcare providers and 6 other users (Including Nurse, MA and Support stuff) matching the target demographic criteria served as participants and used the EHRUT in simulated, but representative tasks.

This study collected performance data on 12 tasks typically conducted

on an EHR:

- Computerized provider order entry – medications
- Computerized provider order entry – laboratory
- Computerized provider order entry – diagnostic imaging
- Drug-drug, drug-allergy interaction checks
- Demographics
- Problem list
- Medication list
- Medication allergy list
- Clinical decision support
- Implantable device list
- Clinical information reconciliation and incorporation
- Electronic prescribing

During the 40 minute one-on-one usability test, each participant was greeted by the administrator and asked to review and
sign an informed consent/release form; they were instructed that they could withdraw at any time. Participants had prior experience with the EHR, participants were given a demo of the system and the required training to participate in usability testing. The administrator introduced the test, and instructed participants to complete a series of tasks (given one at a time) using the EHRUT. During the testing, the administrator timed the test and, along with the data logger(s) recorded user performance data electronically. The administrator did not give the participant assistance in how to complete the task.

Participant screens 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 compensated with $100 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	N	Task Success	Path Deviation	Task Time		Errors	Task Ratings 5=Easy
	#	%	Deviations (Observed/ Optimal)	Mean(SD)	Deviations (Observed/ Optimal)	Mean(SD)	Mean(SD)
Computerized provider order entry – medications	10	100	74/70	121 / 23.97 seconds	121/105	0.30 / 0.48	4.0 / 0.00
Computerized provider order entry – laboratory	10	100	62/60	68 / 5.80 seconds	68/64	0.70 / 0.67	4.7 / 0.48
Computerized provider order entry – diagnostic imaging	10	100	52/50	70 / 5.06 seconds	70/63	0.40 / 0.52	4.5 / 0.53
Drug-drug, drug-allergy interaction checks	10	100	63/60	132 / 11.66 seconds	132/117	0.00 / 0.00	4.3 / 0.67
Demographics	10	100	52/50	64 / 2.90 seconds	64/58	0.50 / 0.53	4.4 / 0.52
Problem list	10	100	63/60	68 / 7.04 seconds	68/59	0.50 / 0.53	4.2 / 0.42
Medication list	10	100	41/40	65 / 1.90 seconds	65/61	0.60 / 0.52	4.7 / 0.48
Medication allergy list	10	100	42/40	70 / 7.04 seconds	70/62	0.70 / 0.48	4.4 / 0.52
Clinical decision support	10	100	30/30	191 / 11.12 seconds	191/140	0.30 / 0.48	3.2 / 0.63
Implantable device list	10	100	43/40	190 / 9.47 seconds	190/146	0.00 / 0.00	3.4 / 0.52
Clinical information reconciliation and incorporation	10	100	40/40	71 / 12.90 seconds	71/66	0.30 / 0.48	4.7 / 0.48

The results from the System Usability Scale scored the subjective satisfaction with the system based on performance with these tasks to be: 89.75**%**

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

- Major findings
    1. Computerized provider order entity for laboratory and diagnostic imaging is well tested with multiple orders. The generation is very easy and easy to track. Users are happy will the less steps required after the order is placed by doctor.
    2. Computerized provider order entity for medication is well tested, as we use a third party service to order medication, there are some part of the process out of our control. Users are moderate happy but suggested if the synchronization of the medication to EHR can be done in less steps.
    3. Demographics, Problem list, Medicaltion list, Medication allergy list screens are very easy to use and access from multiple pages.
    4. Implantable device, some user found it hard to use this feature, as it require to know the device number to populate the data, on the other hand they like the idea that user can manually enter the data.
    5. Clinical information reconciliation and incorporation is moderately easy to use. Users liked the feature of directly processing the CDA file without downloading it. Users also liked the comparison view for the reconciliation.
    6. Users given mixed reaction regarding Clinical decision support. Some users suggested it is complex to configure it. Some users suggested providing another way of viewing the decisions other than popping up the decision every time user open the patient.

- Areas for improvement
    1. Decision support user interface can be friendlier.
    2. Decision support view for patients can be in different wsay, so that user do not have to close the popup every time.
    3. Clinical reconciliation process screen can be improved further, like auto scroll then reconciliation action happens.

2. INTRODUCTION

The EHRUT(s) tested for this study was Novoclinical, 1.0. Designed to present medical information to healthcare providers in clinical settings, the EHRUT consists of doctor and office stuff area to provide a complete healthcare solution to clinics and providers. The usability testing attempted to represent realistic exercises and conditions.

The system is used by the providers and clinical stuff for recording patient relation information and any other related communications. For usability testing a separate system environment was created and the minimum required data or configurations was created prior to the testing. The usability testing attempted to represent realistic exercises and conditions.

The purpose of this study was to test and validate the usability of the current user interface, and provide evidence of usability in the EHR.
Under Test (EHRUT). To this end, measures of effectiveness, efficiency and user satisfaction, such as time on task, were captured during the usability testing.

3. METHOD

I PARTICIPANTS

A total of 10 participants were tested on the EHRUT(s). Participants in the test were Provider, Nurse and Clinical Stuff. Participants were recruited by Novomedici, LLC. In addition, participants had no direct connection to the development of or organization producing the EHRUT(s). Participants were not from the testing or supplier organization. Participants were given the opportunity to have the same orientation and level of training as the actual end users would have received.
For the test purposes, end-user characteristics were identified and translated into a recruitment screener used to solicit potential participants.

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	001	F	37	High school graduate	MA	17 years	17 years	5 years	n/a
2	002	F	37	High school graduate	Receptionist	15 years	15 years	5 years	n/a
3	003	F	52	Bachelor's Degree	Billing	7 years	7 years	3 years	n/a
4	004	F	33	High school graduate	MA	7 years	7 years	3 years	n/a
5	005	F	58	High school graduate	Billing	9 years	9 years	4 years	n/a
6	006	F	24	High school graduate	MA	4 years	4 years	4 years	n/a
7	007	F	41	High school graduate	PA	11 years	11 years	5 years	n/a
8	008	M	57	Doctorate degree	Physician	30 years	30 years	10 years	n/a
9	009	M	55	Doctorate degree	Physician	30 years	30 years	10 years	n/a
10	010	F	42	Doctorate degree	PA	9 years	9 years	6 years	n/a

10 participants (matching the demographics in the section on Participants) were recruited and 10 participated in the usability test. No participants failed to show for the study.

Participants were scheduled for 40 minute sessions with 5 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.

II 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. 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.

III 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:

- **Computerized provider order entry – medications** : User can order an medication or change/refill/change status of an existing order from the e-prescribing software(MdTOolBox).
- **Computerized provider order entry – laboratory :** User will create a laboratory order and send it using electronic means(HL7 or Efax). User can change the order after the order is created.
- **Computerized provider order entry – diagnostic imaging :** User will create a radiology order and send it using electronic means(HL7 or Efax). User can change the order after the order is created.
- **Drug-drug, drug-allergy interaction checks :** User while ordering the medication through MdToolBox can see the Drug-drug, drug – allergy check. The Medication ordering system should show an alert to user so that user can change the drug accordingly or can override the alert with specific reasons.
- **Demographics :** User can insert/update the demography information from patient in to the EHR system. User will be able to save all the specific information(gender, name, dob, race, ethnicity, address, contact information etc).
- **Problem list :** User can insert/update the medical history problem list. User will be able to track the problems by the date or encounter in the system.
- **Medication list :** User can insert/update the medical history medication list. User will be able to track the medications by the date or encounter in the system.
- **Medication allergy list :** User can insert/update the medical history allergy list. User will be able to track the allergies by the date or encounter in the system.
- **Clinical decision support :** User can configure the decisions in the system, the decisions can be on demography or any medical history component like allergy. The system on a successful match of a decision will notify user of the decision and the other details like the developer, created date etc of the decision. The alert will be shown to all the users of the system upon accessing that patient.

- **Implantable device list:** User can insert/update the medical history implantable devices list. User will be able to track the implantable devices from the system medical history of the patient.
- **Clinical information reconciliation and incorporation**

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.

IV PROCEDURES

Upon arrival, participants were greeted; 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. A representative from the test team witnessed the participant's signature.

To ensure that the test ran smoothly, two staff members participated in this test, the usability administrator and the data logger. The usability testing staff conducting the test was experienced usability practitioners with 5 years of experience from Software System background, and has experience in Quality Assurance.

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 (see specific instructions below):

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

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. Scoring is discussed below in Section 3.9.

Following the session, the administrator gave the participant the post-test questionnaire (e.g., the System Usability Scale, see Appendix 5), compensated them for their time, 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 and compensated. Participants signed a receipt and acknowledgement indicating that they had received the compensation.

V TEST LOCATION

The test facility included a waiting area and a quiet testing room with a table, computer for the participant, and recording computer for the administrator. Only the participant and administrator were in the test room. All observers and the data logger worked from a separate room where they could see the participant's screen and face shot, and listen to the audio of the session. To ensure that the environment was comfortable for users, noise levels were kept to a minimum with the ambient temperature within a normal range. All of the safety instruction and evacuation procedures were valid, in place, and visible to the participants.

VI TEST ENVIRONMENT

The EHRUT would be typically be used in a healthcare office or clinic. In this instance, the testing was conducted in a doctor facility. For testing, the computer used a desktop running windows 10.

The participants used a mouse and keyboard when interacting with the EHRUT.

The Novoclinical used resolution 1920X1080. The application was set up according to the vendor's documentation describing the system set-up and preparation. The application is a cloud based application running using a test database deployed in cloud. Technically, the system performance (i.e., response time) was representative to what actual users would experience in a field implementation. Additionally, participants were instructed not to change any of the default system settings (such as control of font size). The machines used in the testing process contains screensize of 19.5", resolution 1920X1080, color settings "Default Blue" and connected in LAN configuration.

VII TEST FORMS AND TOOLS

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

- Informed Consent
- Moderator's Guide
- Post-test Questionnaire
- Incentive Receipt and Acknowledgment Form

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. A web camera recorded each participant's facial expressions synced with the screen capture, and verbal comments were recorded with a microphone. The test session were electronically transmitted to a nearby observation room where the data logger observed the test session.

VIII PARTICIPANT INSTRUCTIONS

The administrator reads the following instructions aloud to each participant :

Thank you for participating in this study. Your input is very important. Our session today will last about 40 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 (10 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 12 tasks to complete. Tasks are listed in the moderator's guide.

IX 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:

- Effectiveness of Novoclinical by measuring participant success rates and errors
- Efficiency of Novoclinical by measuring the average task time and path deviations
- Satisfaction with Novoclinical by measuring ease of use ratings

4. DATA SCORING

The following table details how 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.
Effectiveness: Task Failures	If the participant abandoned the task, did not reach the correct answer or performed it incorrectly, or reached the end of the allotted time before successful completion, the task was counted as an "Failures." No task times were taken for errors. The total number of errors was calculated for each task and then divided by the total number of times that task was attempted. Not all deviations would be counted as errors. This should also be expressed as the mean number of failed tasks per participant. On a qualitative level, an enumeration of errors and error types should be collected.
Efficiency: Task Deviations	The participant's path (i.e., steps) through the application was recorded. Deviations occur if the participant, for example, went to a wrong screen, clicked on an incorrect menu item, followed an incorrect link, or interacted incorrectly with an on-screen control. This path was compared to the optimal path. The number of steps in the observed path is divided by the number of optimal steps to provide a ratio of path deviation. It is strongly recommended that task deviations be reported. Optimal paths (i.e., procedural steps) should be recorded when constructing tasks.
Efficiency: Task Time	Each task was timed from when the administrator said "Begin" until the participant said, "Done." If he or she failed to say "Done," the time was stopped when the participant stopped performing the task. Only task times for tasks that were successfully completed were included in the average task time analysis. Average time per task was calculated for each task. Variance measures (standard deviation and standard error) were also calculated.
Satisfaction: Task Rating	Participant's subjective impression of the ease of use of the application was measured by administering both a simple post-task question as well as a post-session questionnaire. After each task, the participant was asked to rate "Overall, this task was:" on a scale of 1 (Very Difficult) to 5 (Very Easy). These data are averaged across participants. Common convention is that average ratings for systems judged easy to use should be 3.3 or above. To measure participants' confidence in and likeability of the Novoclinical 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."

5. RESULTS

I DATA ANALYSIS AND REPORTING

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

The usability testing results for the EHRUT are detailed below. 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	N	Task Success	Path Deviation	Task Time		Errors	Task Ratings 1=Easy
	#	%	Deviations (Observed/ Optimal)	Mean(SD)	Deviations (Observed/ Optimal)	Mean(SD)	Mean(SD)
Computerized provider order entry – medications	10	100	74/70	121 / 23.97 seconds	121/105	0.30 / 0.48	4.0 / 0.00
Computerized provider order entry – laboratory	10	100	62/60	68 / 5.80 seconds	68/64	0.70 / 0.67	4.7 / 0.48
Computerized provider order entry – diagnostic imaging	10	100	52/50	70 / 5.06 seconds	70/63	0.40 / 0.52	4.5 / 0.53
Drug-drug, drug-allergy interaction checks	10	100	63/60	132 / 11.66 seconds	132/117	0.00 / 0.00	4.3 / 0.67
Demographics	10	100	52/50	64 / 2.90 seconds	64/58	0.50 / 0.53	4.4 / 0.52
Problem list	10	100	63/60	68 / 7.04 seconds	68/59	0.50 / 0.53	4.2 / 0.42
Medication list	10	100	41/40	65 / 1.90 seconds	65/61	0.60 / 0.52	4.7 / 0.48
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Clinical decision support	10	100	30/30	191 / 11.12 seconds	191/140	0.30 / 0.48	3.2 / 0.63
Implantable device list	10	100	43/40	190 / 9.47 seconds	190/146	0.00 / 0.00	3.4 / 0.52
Clinical information reconciliation and incorporation	10	100	40/40	71 / 12.90 seconds	71/66	0.30 / 0.48	4.7 / 0.48

The results from the SUS (System Usability Scale) scored the subjective satisfaction with the system based on performance with these tasks to be: 89.75%.

II DISCUSSION OF THE FINDINGS

1. Decision support user interface can be friendlier.
2. Decision support view for patients can be in different way, so that user do not have to close the popup every time.
3. Clinical reconciliation process screen can be improved further, like auto scroll then reconciliation action happens.
4. Implantable device can be further upgraded to be more user friendly.

EFFECTIVENESS

Novoclinical system is easy to use as per the user experience, there are some findings that are discussed in finding section. Users were only helped if they deviate the path.

EFFICIENCY

For most of the test items the test user did not deviate much from the expert user. Only the implantable device and Clinical decision support system has some observed deviation in task time.

SATISFACTION

Overall users are satisfied with the way system works. Some points regarding Clinical Decision support and Implantable device are mentioned by the user which are discussed in findings.

MAJOR FINDINGS

1. Computerized provider order entity for laboratory and diagnostic imaging is well tested with multiple orders. The generation is very easy and easy to track. Users are happy will the less steps required after the order is placed by doctor.
2. Computerized provider order entity for medication is well tested, as we use a third party service to order medication, there are some part of the process out of our control. Users are moderate happy but suggested if the synchronization of the medication to EHR can be done in less steps.
3. Demographics, Problem list, Medicaltion list, Medication allergy list and implantable device screens are very easy to use and access from multiple pages.
4. Clinical information reconciliation and incorporation is moderately easy to use. Users liked the feature of directly processing the CDA file without downloading it. Users also liked the comparison view for the reconciliation.
5. Users given mixed reaction regarding Clinical decision support. Some users suggested it is complex to configure it. Some users suggested providing another way of viewing the decisions other than popping up the decision every time user open the patient.

AREAS FOR IMPROVEMENT

1. Decision support user interface can be friendlier.
2. Decision support view for patients can be in different way, so that user do not have to close the popup every time.
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Novoclinical 1.0

Date of Usability Test: 11/11/2024, 11/25/2024
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6. EXECUTIVE SUMMARY

A usability test of Novoclinical, 1.0 (Clinical Practice Management EHR) was conducted on 11/11/2024 and 11/25/2024 by Novomedici Quality Assurance Team. 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).

Federal government standards is used:
• Name: NISTIR 7741
• Description: An established UCD process ensures that designed EHRs are efficient, effective, and satisfying to the user.
• Citation (URL and/or publication citation): https://www.nist.gov/publications/nistir-7741-nist-guide-processes-approach-improving-usability-electronic-health-records

During the usability test, 8 healthcare providers and 2 other users (MA) matching the target demographic criteria served as participants and used the EHRUT in simulated, but representative tasks.

This study collected performance data on 10 tasks typically conducted on an EHR:

- Create and save a controlled substance prescription
- Create and save a non-controlled substance prescription
- Send a Prescription
- Send multiple Prescription
- Approve refill request
- Approve rxchange request
- Deny refill request
- Deny rxchange request
- Check prescription status
- Send and receive prescription history

During the 15 minute one-on-one usability test, each participant was greeted by the administrator and asked to review and sign an informed consent/release form; they were instructed that they could withdraw at any time. Participants had prior experience with the EHR, participants were given a demo of the system and the required training to participate in usability testing. The administrator introduced the test, and instructed participants to complete a series of tasks (given one at a time) using the EHRUT. During the testing, the administrator timed the test and, along with the data logger(s) recorded user performance data electronically. The administrator did not give the participant assistance in how to complete the task.

Participant data 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
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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 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.

The results from the System Usability Scale scored the subjective satisfaction with the system based on performance with these tasks to be: 87.25

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

- Major findings
  Users are moderate happy and suggested small user interface related changes.

- Areas for improvement
  Some users suggested separate selection for medication and dosage.

7. INTRODUCTION

The EHRUT(s) tested for this study was Novoclinical, 1.0. Designed to present medical information to healthcare providers in clinical settings, the EHRUT consists of doctor and office stuff area to provide a complete healthcare solution to clinics and providers. The usability testing attempted to represent realistic exercises and conditions.

The system is used by the providers and clinical stuff for recording patient relation information and any other related communications. For usability testing a separate system environment was created and the minimum required data or configurations was created prior to the testing. The usability testing attempted to represent realistic exercises and conditions.

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8. METHOD

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For the test purposes, end-user characteristics were identified and translated into a recruitment screener used to solicit potential participants.

Participants had a mix of backgrounds and demographic characteristics conforming to the recruitment screener. Participant names were replaced with Participant IDs so that an individual's data cannot be tied back to individual identities.

10 participants (matching the demographics in the section on Participants) were recruited and 10 participated in the usability test. No participants failed to show for the study. Some participants were offsite.

Participants were scheduled for 15 minute sessions with 5 minutes 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.

ID	Gender	Age	Education	Occupation /Role	Professional Experience	Computer Experience	Product Experience	Assistive Technology Needs
001N	Female	30-39	Doctorate degree	Physician	129.00	129.00	24.00	No
002N	Female	30-39	Doctorate degree	Physician	129.00	129.00	24.00	No
003N	Male	50-59	Doctorate degree	Physician	288.00	288.00	36.00	No
004N	Male	50-59	Doctorate degree	Physician	180.00	180.00	25.00	No
005N	Female	40-49	Doctorate degree	Physician	120.00	120.00	28.00	No
006N	Female	40-49	High school graduate, diploma or the equivalent	Medical Assistant	60.00	60.00	12.00	No
007N	Male	50-59	High school graduate, diploma or the equivalent	Medical Assistant	72.00	72.00	12.00	No
008N	Female	40-49	Doctorate degree	Physician	122.00	122.00	12.00	No
009N	Female	40-49	Doctorate degree	Physician	172.00	170.00	12.00	No
010N	Female	40-49	Doctorate degree	Physician	180.00	180.00	12.00	No

II 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. Each participant used the system, 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.

III 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:

- **Create and save a controlled substance prescription**
- **Create and save non-controlled substance prescription(s)**
- **Send a Prescription :** Send the previously written prescription
- **Send multiple Prescription :** Send multiple prescription
- **Approve refill request :** Approve a pharmacy refill request.
- **Approve rxchange request :** Approve a pharmacy rxchange request.
- **Deny refill request :** Deny a pharmacy refill request.
- **Deny rxchange request :** Deny a pharmacy rxchange request.
- **Check prescription status :** Check the prescription log to see the prescription status.
- **Send and receive prescription history :** Send an history request and receive prescription history data in the EMR system.

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.

IV PROCEDURES

Upon arrival, participants were greeted; 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. A representative from the test team witnessed the participant's signature.

To ensure that the test ran smoothly, two staff members participated in this test, the usability administrator and the data logger. The usability testing staff conducting the test was experienced usability practitioners with 5 years of experience from Software System background, and has experience in Quality Assurance.

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 (see specific instructions below):

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

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. Scoring is discussed below in Section 3.9.

Following the session, the administrator gave the participant the post-test questionnaire (e.g., the System Usability Scale, see Appendix 5), compensated them for their time, 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.

V TEST LOCATION

The test facility included a waiting area and a quiet testing room with a table, computer for the participant, and recording computer for the administrator. Only the participant and administrator were in the test room. All observer(s) and the data logger worked from a separate room where they could see the participant's screen and face shot, and listen to the audio of the session. To ensure that the environment was comfortable for users, noise levels were kept to a minimum with the ambient temperature within a normal range. All of the safety instruction and evacuation procedures were valid, in place, and visible to the participants. Some participants were joined offsite and was given the same instructions using online meeting tools where observer(s) can view the participant's screen, face and audio.

VI TEST ENVIRONMENT

The EHRUT would be typically be used in a healthcare office or clinic. In this instance, the testing was conducted in a doctor facility. For testing, the computer used a desktop running windows 10.

The participants used a mouse and keyboard when interacting with the EHRUT.

The Novoclinical used resolution 1920X1080. The application was set up according to the vendor's documentation describing the system set-up and preparation. The application is a cloud based application running using a test database deployed in cloud. Technically, the system performance (i.e., response time) was representative to what actual users would experience in a field implementation. Additionally, participants were instructed not to change any of the default system settings (such as control of font size). The machines used in the testing process contains screensize of 19.5", resolution 1920X1080, color settings "Default Blue" and connected in LAN configuration.

VII TEST FORMS AND TOOLS

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

- Informed Consent
- Moderator's Guide
- Post-test Questionnaire
- Incentive Receipt and Acknowledgment Form

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. The test session were electronically transmitted to a nearby observation room where the data logger observed the test session.

VIII PARTICIPANT INSTRUCTIONS

The administrator reads the following instructions aloud to each participant :

Thank you for participating in this study. Your input is very important. Our session today will last about 15 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 (5 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.

IX 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:

- Effectiveness of Novoclinical by measuring participant success rates and errors
- Efficiency of Novoclinical by measuring the average task time and path deviations
- Satisfaction with Novoclinical by measuring ease of use ratings

9. DATA SCORING

The following table details how 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.
Effectiveness: Task Failures	If the participant abandoned the task, did not reach the correct answer or performed it incorrectly, or reached the end of the allotted time before successful completion, the task was counted as an "Failures." No task times were taken for errors. The total number of errors was calculated for each task and then divided by the total number of times that task was attempted. Not all deviations would be counted as errors. This should also be expressed as the mean number of failed tasks per participant. On a qualitative level, an enumeration of errors and error types should be collected.
Efficiency: Task Deviations	The participant's path (i.e., steps) through the application was recorded. Deviations occur if the participant, for example, went to a wrong screen, clicked on an incorrect menu item, followed an incorrect link, or interacted incorrectly with an on-screen control. This path was compared to the optimal path. The number of steps in the observed path is divided by the number of optimal steps to provide a ratio of path deviation. It is strongly recommended that task deviations be reported. Optimal paths (i.e., procedural steps) should be recorded when constructing tasks.
Efficiency: Task Time	Each task was timed from when the administrator said "Begin" until the participant said, "Done." If he or she failed to say "Done," the time was stopped when the participant stopped performing the task. Only task times for tasks that were successfully completed were included in the average task time analysis. Average time per task was calculated for each task. Variance measures (standard deviation and standard error) were also calculated.
Satisfaction: Task Rating	Participant's subjective impression of the ease of use of the application was measured by administering both a simple post-task question as well as a post-session questionnaire. After each task, the participant was asked to rate "Overall, this task was:" on a scale of 1 (Very Difficult) to 5 (Very Easy). These data are averaged across participants. Common convention is that average ratings for systems judged easy to use should be 3.3 or above. To measure participants' confidence in and likeability of the Novoclinical 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."

Measure / Task	N	Task Success	Path Deviation	Task Time		Errors	Task Ratings 1=Easy
	#	Mean (SD)	Deviations (Observed/ Optimal)	Mean(SD)	Deviations (Observed/ Optimal)	Mean(SD)	Mean(SD)
Create and save a controlled substance prescription	10	94.50(9.60)	5/5	80 (9)	80/75	.70 (1.50)	4.6 (0.48)
Create and save a non-controlled substance prescription	10	93.10(9.40)	7/6	80 (6)	80/75	.40(.80)	4.45 (0.47)
Send a Prescription	10	100.00(0.00)	4/4	20 (4)	20/20	0 (0)	4.62 (0.48)
Send multiple Prescription	10	93.75(9.16)	5/5	25 (9)	25/25	.62 (1.11)	4.5 (0.5)
Approve refill request	10	98.38(4.59)	4/4	60 (13)	60/55	.75 (1.29)	4.68 (0.44)
Approve rxchange request	10	98.63(2.55)	4/4	30 (6)	30/30	.62 (1.31)	4.62 (0.48)
Deny refill request	10	100.00(0.00)	4/4	60 (5)	60/60	0 (0)	4.43 (0.58)
Deny rxchange request	10	94.25(8.46)	5/4	30 (5)	30/35	.87 (1.53)	4.31 (0.55)
Check prescription status	10	92.50(8.86)	5/4	20 (3)	20/20	.87 (1.16)	4.56 (0.46)
Send and receive prescription history	10	94.00(6.99)	6/5	75 (10)	75/70	.90 (1.22)	4.55 (0.56)

10. RESULTS

I DATA ANALYSIS AND REPORTING

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

The usability testing results for the EHRUT are detailed below. 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.

The results from the SUS (System Usability Scale) scored the subjective satisfaction with the system based on performance with these tasks to be: 87.25

II DISCUSSION OF THE FINDINGS

1. Some small user interface updates were suggested.

EFFECTIVENESS

Novoclinical system is easy to use as per the user experience, there are some findings that are discussed in finding section. Users were only helped if they deviate the path.

EFFICIENCY

For most of the test items the test user did not deviate much from the expert user.

SATISFACTION

Overall users are satisfied with the way system works.

MAJOR FINDINGS

1. Providers found it very easy to send multiple prescription including controlled substance at one go.
2. Providers found it user friendly to save favorites.

AREAS FOR IMPROVEMENT

While the system is rated highly, there could be specific minor areas to address to further improve usability. For instance, Participant 4 and Participant 9 had slightly lower scores compared to others, which could indicate a need for some refinements, especially related to consistency or technical support needs.

11. Appendix: System Usability Scale (SUS) Questionnaire for Prescription System

Instructions:
Please rate the following statements based on your experience with the prescription system. Use the following scale to indicate your agreement with each statement:
1 = Strongly Disagree
2 = Disagree
3 = Neutral
4 = Agree
5 = Strongly Agree
1. I think I would like to use this system frequently.
(This statement relates to how likely the user would be to use the system in the future.)

Response:
[1 | 2 | 3 | 4 | 5]

2. I found the system unnecessarily complex.
(This statement evaluates how easy or difficult the system felt to the user.)

Response:
[1 | 2 | 3 | 4 | 5]

3. I thought the system was easy to use.
(This tests the simplicity of the system's interface.)

Response:
[1 | 2 | 3 | 4 | 5]

4. I think I would need the support of a technical person to be able to use this system.
(This statement assesses how self-explanatory the system felt.)

Response:
[1 | 2 | 3 | 4 | 5]

5. I found the various functions in this system were well integrated.
(This evaluates whether the user thought the tasks were well connected within the system.)

Response:
[1 | 2 | 3 | 4 | 5]

6. I thought there was too much inconsistency in this system.
(This is about how consistent the system feels throughout different tasks.)

Response:
[1 | 2 | 3 | 4 | 5]

7. I would imagine that most people would learn to use this system very quickly.
(This tests how intuitive the system was for users.)

Response:
[1 | 2 | 3 | 4 | 5]

8. I found the system very cumbersome to use.
(This is about how clunky or awkward the system felt.)

Response:
[1 | 2 | 3 | 4 | 5]

9. I felt very confident using the system.
(This statement evaluates the user's confidence in performing tasks within the system.)

Response:
[1 | 2 | 3 | 4 | 5]

10. I needed to learn a lot of things before I could get going with this system.
(This assesses how much the user felt they needed to learn to use the system effectively.)

Response:
[1 | 2 | 3 | 4 | 5]

EHR Usability Task Scenario Report of Novoclinical 1.0

Novoclinical 1.0

Date of Report: 11/11/2024

Report Prepared By
Novomedici Quality Assurance Team
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All tasks below are correspond to 170.315(b)(3) criterion.

Task: Create and save a controlled substance prescription. **Instructions:** Imagine that you are trying to prescribe a controlled substance medication. Please navigate to e-prescription screen for the dummy patient and prescribe the controlled substance medication. **Success criteria:** - User is able to find the page for e-prescription - User is able to save the controlled substance medication prescription request. **Notes:** Pay attention to how the user navigates through the website, including how they navigate to the e-prescription page for the dummy patient, and create the prescription. Observe any issues that arise during the process, and note down feedback or questions from the user during the task.
Task: Create and save a non-controlled substance prescription **Instructions:** Imagine that you are trying to prescribe a non-controlled substance medication. Please navigate to e-prescription screen for the dummy patient and prescribe the non-controlled substance medication. Please create and save multiple prescriptions, including a liquid medication. **Success criteria:** - User is able to find the page for e-prescription - User is able to save the non-controlled substance medication prescription request. **Notes:** Pay attention to how the user navigates through the website, including how they navigate to the e-prescription page for the dummy patient, and create the prescription. Observe any issues that arise during the process, and note down feedback or questions from the user during the task.
Task: Send a Prescription **Instructions:** Imagine that you are trying to send the saved controlled substance medication. Please navigate to e-prescription screen for the dummy patient and send the non-controlled substance prescription.

Success criteria:

- User is able to find the page for e-prescription
- User is able to find the saved controlled substance medication prescription request.
- User is able to successfully send the generated prescription.

Notes: Pay attention to how the user navigates through the website, including how they navigate to the e-prescription page for the dummy patient, then find and send the prescription. Observe any issues that arise during the process, and note down feedback or questions from the user during the task.

Task: Send multiple Prescription

Instructions: Imagine that you are trying to send the multiple saved prescriptions. Please navigate to e-prescription screen for the dummy patient and select all the saved prescription you want to send, then send the prescriptions.

Success criteria:

- User is able to find the page for e-prescription
- User is able to find the saved prescription requests.
- User is able to successfully select and send the selected prescriptions.

Notes: Pay attention to how the user navigates through the website, including how they navigate to the e-prescription page for the dummy patient, then select and send the prescriptions. Observe any issues that arise during the process, and note down feedback or questions from the user during the task.

Task: Approve refill request

Instructions: Imagine that you are trying to approve a refill request received from the pharmacy. Please navigate to Erx Dutysheet screen and find the refill request to view and approve the request.

Success criteria:

- User is able to find the page for erx dutysheet
- User is able to find the refill requests received from the pharmacy.
- User is able to successfully view and approve the refill request.

Notes: Pay attention to how the user navigates through the website, including how they navigate to the erx dutysheet page for the dummy patient, then view and approve the refill request. Observe any issues that arise during the process, and note down feedback or questions from the user during the task.

Task: Approve rxchange request

Instructions: Imagine that you are trying to approve a rxchange request received from the pharmacy. Please navigate to Erx Dutysheet screen and find the rxchange request to view and approve the request.

Success criteria:

- User is able to find the page for erx dutysheet
- User is able to find the rxchange requests received from the pharmacy.
- User is able to successfully view and approve the rxchange request.

Notes: Pay attention to how the user navigates through the website, including how they navigate to the erx dutysheet page for the dummy patient, then view and approve the rxchange request. Observe any issues that arise during the process, and note down feedback or questions from the user during the task.

Task: Deny refill request

Instructions: Imagine that you are trying to deny a refill request received from the pharmacy. Please navigate to Erx Dutysheet screen and find the refill request to view and deny the request.

Success criteria:
- User is able to find the page for erx dutysheet
- User is able to find the refill requests received from the pharmacy.
- User is able to successfully view and deny the refill request.

Notes: Pay attention to how the user navigates through the website, including how they navigate to the erx dutysheet page for the dummy patient, then view and deny the refill request. Observe any issues that arise during the process, and note down feedback or questions from the user during the task.

Task: Deny rxchange request

Instructions: Imagine that you are trying to deny a rxchange request received from the pharmacy. Please navigate to Erx Dutysheet screen and find the rxchange request to view and deny the request.

Success criteria:
- User is able to find the page for erx dutysheet
- User is able to find the rxchange requests received from the pharmacy.
- User is able to successfully view and deny the rxchange request.

Notes: Pay attention to how the user navigates through the website, including how they navigate to the erx dutysheet page for the dummy patient, then view and deny the rxchange request. Observe any issues that arise during the process, and note down feedback or questions from the user during the task.

Task: Check prescription status

Instructions: Imagine that you are trying to check prescription status. Please navigate to e-prescription screen for the dummy patient and find the sent prescription and then click on the status to view the prescription status.

Success criteria:
- User is able to find the page for e-prescription
- User is able to find the sent prescriptions.
- User is able to successfully view the prescription status.

Notes: Pay attention to how the user navigates through the website, including how they navigate to the e-prescription page for the dummy patient, then view the prescription status. Observe any issues that arise during the process, and note down feedback or questions from the user during the task.

Task: Send and receive prescription history

Instructions: Imagine that you are trying to check send prescription history request for a dummy patient and also want to receive and reconcile the history data. Please navigate to medical history screen for the dummy patient and find the sent sync rx button and then click on the button to request prescription history. Upon receiving the data reconcile the data in the patient medical history.

Success criteria:
- User is able to find the page for medical history
- User is able to find the sync rx button
- User is able to successfully send request for prescription history using the sync rx button
- User is able to receive and reconcile the prescription history in patient medical history.

Notes: Pay attention to how the user navigates through the website, including how they navigate to the medical history page for the dummy patient, then request the prescription history. Then notice how user is reconciling the

received prescription in medical history page. Observe any issues that arise during the process, and note down feedback or questions from the user during the task.

EHR Usability Task Scenario Report of Novoclinical 1.0

Novoclinical 1.0

Date of Usability Test: August 15–16, 2025
Date of Report: August 23, 2025

Report Prepared By
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Note: This usability study was developed using the NISTIR 7742 template as a guide for reporting findings: *Customized Common Industry Format Template for Electronic Health Record Usability Testing*.

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I EXECUTIVE SUMMARY

A usability test of Novoclinical EMR v1.0 (Electronic Health Record system) was conducted on August 15-16, 2025 by Novomedici Quality Assurance Team. The purpose of this test was to evaluate and validate the usability of the current user interface and provide evidence of usability for the Clinical Decision Support Intervention (DSI) module in the EHR Under Test (EHRUT).

During the usability test, 10 healthcare providers matching the target demographic criteria served as participants and performed simulated, but representative tasks

User-Centered Design Process

The UCD process applied was based on NISTIR 7741: NIST Guide to the Processes Approach for Improving the Usability of Electronic Health Records. According to this standard, EHRs should support processes that enable users to achieve their goals with safety, effectiveness, efficiency, and satisfaction. The process was iterative and involved representative users throughout the design and development lifecycle.

The following key principles of NISTIR 7741/7742 were followed**:**

- The design is based on understanding specific user group needs, workflows, and environments.
- Users are actively involved throughout the design and development.
- The design is driven and refined by user-centered evaluation and feedback.
- The process is iterative, allowing continuous improvement.
- The design addresses the whole user experience, not just isolated features.
- Clear goals and measurable usability objectives are defined from the start.
- Multiple design alternatives are considered and compared before final decisions.
- Usability is measured by effectiveness, efficiency, and user satisfaction.
- The system is adapted with users until performance objectives are met.

Reference: Zhang & Walji, 2011, NISTIR 7741, National Institute of Standards and Technology, Gaithersburg, MD. https://ws680.nist.gov/publication/get_pdf.cfm?pub_id=907313

Performance data for the Clinical Decision Support Intervention (DSI) tasks under ONC §170.315(b)(11) were collected to evaluate system usability, effectiveness, and efficiency. The testing focused on tasks associated with new b11 requirements not included in §170.315(a)(9).

Participants completed a total of 17 task scenarios, divided into 7 major categories:

- Evidence-based DSI creation and modification
- Predictive DSI configuration and testing
- Feedback management
- Patient report generation
- Risk management
- Intervention configuration
- System administration

During the 90-minute one-on-one usability test, each participant was greeted by the administrator and asked to review and sign an informed consent/release form (included in Appendix 3); they were instructed that they could

withdraw at any time. Participants did not have prior experience with the EHR. Participant screens, head shots, and audio were recorded for subsequent analysis. The administrator introduced the test and instructed participants to complete a series of tasks (given one at a time) using the EHR Under Test (EHRUT). During testing, the administrator timed the tasks and, along with the data logger(s), recorded user performance data both on paper and electronically. The administrator did not provide participants with assistance on how to complete the tasks.

Reference:

National Institute of Standards and Technology. (2010). NIST GUIDE TO THE PROCESSES APPROACH FOR IMPROVING THE USABILITY OF ELECTRONIC HEALTH RECORDS (NISTIR 7741). Gaithersburg, MD.
www.nist.gov/manuscript-publication-search.cfm?pub_id=907313
http://ws680.nist.gov/publication/get_pdf.cfm?pub_id=907312

The following types of data were collected for each participant:

- Demographic data
- Number of tasks successfully completed
- Time to complete the tasks
- Number and types of errors
- Path deviations
- Participant's verbalizations (comments)
- 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 compensated with **$100** 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.

Table 1 Performance and Rating Summary for the EHRUT

Task	Task Success Rate (Mean %)	Task Satisfaction Rating (Mean, 1=Very Difficult – 5=Very Easy)
1.1 Create Evidence-Based Clinical Decision Support Intervention	100.0	4.55
1.2 Modify Source Attributes for Evidence-Based DSI	98.4	4.85
1.3 Provide Feedback for Evidence-Based DSI	100.0	4.88
2.1 Create Predictive Decision Support Intervention	93.6	4.66
2.2 Configure Predictive Algorithm Source Attributes	96.3	4.77
2.3 Test Predictive DSI with Patient Data	97.6	4.38
3.1 Access Clinical Decision Feedback List	100.0	4.88

Task	Task Success Rate (Mean %)	Task Satisfaction Rating (Mean, 1=Very Difficult – 5=Very Easy)
3.2 Review Individual Feedback Details	99.3	4.80
3.3 Generate Feedback Statistics Report	98.2	4.22
4.1 Generate Patient Report with DSI Data	100.0	4.77
4.2 Review DSI Impact in Patient Context	96.8	4.55
5.1 Perform Risk Analysis for DSI	88.9	4.66
5.2 Configure Risk Matrix for DSI	100.0	4.77
6.1 Configure Multiple Intervention Types	95.0	4.38
6.2 Modify Intervention Source Attributes	90.6	4.10
7.1 Manage Clinical Decision Support List	100.0	4.83
7.2 Configure System Settings for DSI	92.0	4.66

Major Findings

Based on the Task Satisfaction Ratings, participants generally found the EHR system easy to use. The mean satisfaction ratings were high across all tasks, typically between 4.1 and 4.9 on a 5-point scale.

Participants did report that the initial learning curve is steep and emphasized the importance of training for efficient task completion. However, once familiar with the application, users were able to complete tasks with high efficiency and effectiveness.

The Task Success Rate was consistently strong, with most tasks achieving over 95% completion success. More complex tasks, such as configuring predictive algorithms or performing risk analysis, showed slightly lower success rates (≈89–93%), indicating these areas may benefit from streamlined workflows or enhanced training.

Areas For Improvement

While participants rated the EHR as easy to use overall, analysis of performance data highlighted specific areas for improvement:

- Complex Predictive and Risk-Based Tasks
    - Tasks such as *Create Predictive DSI (2.1)*, *Perform Risk Analysis (5.1)*, and *Configure System Settings (7.2)* showed lower success rates (≈89–93%) compared to other tasks that consistently reached near 100%.
    - These modules involve multiple steps and higher cognitive load, suggesting a need for streamlined workflows and step-by-step guidance.

- Error-Prone Interventions
    - Tasks like *Modify Intervention Source Attributes (6.2)* and *Test Predictive DSI with Patient Data (2.3)* showed higher error rates (≈1.0–1.1%).
    - Improvements in field validation, clearer input prompts, and inline instructions would reduce mistakes.
- Efficiency Gaps in Risk and Predictive Modules
    - Tasks involving predictive configurations and risk analysis had longer completion times than their optimal benchmarks (e.g., 290–307 seconds vs. ~300 seconds ideal).
    - Optimizing navigation paths and reducing redundant steps could improve efficiency.
- Consistency in User Experience
    - While simple tasks (feedback submission, list access) were completed easily with high satisfaction (>4.8/5), more complex modules dropped to 4.1–4.4 ratings.
    - Increasing UI consistency, icon clarity, and contextual help would bring complex tasks in line with simpler ones.

II INTRODUCTION

The EHRUT tested for this study was Novoclinical EMR, which includes the implementation of a clinical decision support (CDS) intervention functionality. Designed to present medical information to healthcare providers in clinical practice settings, the EHRUT consists of modules that support decision-making and enhance the delivery of patient care. The usability testing was designed to reflect realistic exercises and conditions that simulate everyday clinical workflows.

The purpose of this study was to test and validate the usability of the newly implemented CDS intervention functionality required under ONC criterion §170.315(b)(11), which expands upon the previous §170.315(a)(9) standards. During the sessions, participants engaged in tasks that involved triggering and responding to CDS interventions, reviewing and acting on system-generated alerts, and configuring CDS rules within the EMR. For each task, usability metrics were collected to assess effectiveness, efficiency, and satisfaction, including task success rates, time on task, error frequency, and user satisfaction ratings.

III METHOD

1. Participants

A total of 10 participants were tested on the EHRUT. Participants in the test were healthcare providers, including eight physicians and two medical assistants. Participants were recruited by the study team and were compensated with $100 for their time.

None of the participants had a direct connection to the development of, or organization producing, the EHRUT. Participants were not from the testing or supplier organization. Each participant was provided with the same orientation and level of training as typical end users would receive prior to using the system.

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

Recruited participants represented a mix of backgrounds and demographic characteristics conforming to the recruitment screener. Participant information, including demographics, education, role, professional and computer experience, product experience, and assistive technology needs, is provided in Appendix 2. To protect confidentiality, participant names were replaced with unique Participant IDs.

All 10 recruited participants completed the test, with no absentees. Each session was conducted individually and lasted approximately 5–10 minutes, with 2–4 minute intervals between sessions for debriefing and resetting the system to test-ready conditions.

2. Study Design

Overall, the objective of this usability test was to evaluate how effectively, efficiently, and satisfactorily participants could complete representative tasks within the system. The study aimed to uncover both areas where the application performed well and areas requiring improvement to better meet user needs. The data collected in this test may serve as a baseline for future usability evaluations with updated versions of the system or for comparison with other systems using the same tasks.

The EHRUT tested in this study, Novoclinical EMR v1.0, was developed by Novomedici, a health information technology company specializing in electronic medical record (EMR) solutions. The company's mission is to support healthcare providers in delivering safer and more efficient patient care through intuitive, standards-compliant clinical software. This usability test forms part of the organization's commitment to user-centered design (UCD) and compliance with the ONC Safety-Enhanced Design requirements.

Each participant interacted with the application individually in the same controlled setting and followed a consistent set of instructions. Sessions lasted approximately 5–10 minutes, including 2–4 minutes for post-test debriefing and satisfaction rating.

The system was evaluated according to standard usability metrics of effectiveness, efficiency, and satisfaction, using measures collected and analyzed for each participant:

- Number of tasks successfully completed within the allotted time without assistance
- Time taken to complete each task
- 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.

3. Tasks

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

- T1: Create Evidence-Based Clinical Decision Support Intervention
- T2: Modify Source Attributes for Evidence-Based DSI
- T3: Provide Feedback for Evidence-Based DSI
- T4: Create Predictive Decision Support Intervention
- T5: Configure Predictive Algorithm Source Attributes

- T6: Test Predictive DSI with Patient Data
- T7: Access Clinical Decision Feedback List
- T8: Review Individual Feedback Details
- T9: Generate Feedback Statistics Report
- T10: Generate Patient Report with DSI Data
- T11: Review DSI Impact in Patient Context
- T12: Perform Risk Analysis for DSI
- T13: Configure Risk Matrix for DSI
- T14: Configure Multiple Intervention Types
- T15: Modify Intervention Source Attributes
- T16: Manage Clinical Decision Support List
- T17: Configure System Settings for DSI

The tasks chosen for this study were based on how often they are performed, their importance to the overall functionality, and the likelihood that users may find them challenging. Each task was designed with the study's objectives in mind to ensure relevant and meaningful evaluation.

4. Procedures

Upon arrival, participants were greeted and their identities were verified against the participant schedule. Each participant was assigned a unique Participant ID to ensure anonymity. Participants then reviewed and signed an informed consent and release form (see Appendix 3), which was witnessed by a representative from the test team.

To ensure smooth operation of the test, two members of the research team facilitated each session: a usability administrator and a data logger. Both staff members were experienced usability practitioners with over 10 years of professional experience conducting usability evaluations. The administrator moderated the session, providing task instructions, monitoring task completion, recording task times, and collecting post-task rating data. The data logger recorded observations including task success, errors, path deviations, and participant comments.

Participants were instructed to perform the tasks (see instructions below):

- As quickly as possible, making as few errors and deviations as possible.
- Without assistance; the administrator was permitted to provide immaterial guidance or clarification regarding the task, but not instructions on system use.
- Without using a think-aloud technique, though any spontaneous comments were noted.

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. Scoring is discussed below in Section 3.9.

Following the session, the administrator gave the participant the post-test questionnaire (e.g., the System Usability Scale, see Appendix 5), compensated them for their time, 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 and compensated. Participants signed a receipt and acknowledgement form (See Appendix 6) indicating that they had received the compensation.

5. Test Location

The test facility consisted of a designated waiting area and a controlled testing room equipped with a table, a participant computer, and a recording computer for the administrator. Access to the testing room was limited to the participant and the administrator. Observers and the data logger were located in a separate observation room, where they were able to view the participant's screen and facial expressions, as well as listen to the session audio. To ensure a safe and comfortable environment, noise levels were minimized, and the ambient temperature was maintained within a standard range. All safety instructions and evacuation procedures were valid, implemented, and clearly posted for participant awareness.

6. Test Environment

The EHRUT would typically be used in a healthcare office or facility. In this instance, the Novoclinical EMR usability testing was conducted in a controlled office environment that simulated a typical healthcare setting. For testing, the computer used was a standard desktop running Windows 11. Participants interacted with the system using a mouse and keyboard.

The Novoclinical EMR was displayed on a 24-inch monitor with 1920x1080 resolution and default color settings. The application was set up by the vendor according to the system documentation describing set-up and preparation. The application itself was running on a Windows platform using a test database connected through a LAN network. Technically, system performance (e.g., response time) during testing was representative of what actual users would experience in a real clinical implementation. Participants were instructed not to change any default system settings, such as font size or display preferences.

7. Test Forms And Tools

During the usability test, the following documents and instruments were used:

1. Informed Consent Form
2. Moderator's Guide
3. Post-test Questionnaire

Examples of these documents can be found in Appendices 3–5, respectively. The Moderator's Guide was designed to capture all required data during testing.

The participant's interaction with the Novoclinical EHRUT was captured and recorded digitally using screen capture software installed on the test machine. A web camera recorded each participant's facial expressions, which were synchronized with the screen capture, and verbal comments were collected through a microphone.

The audio and video feeds from each session were electronically transmitted to an adjacent observation room, where the data logger observed the test session in real time.

8. Participant Instructions

The administrator reads the following instructions aloud to each participant:

Thank you for participating in this study. Your input is very important. Our session today will last about 90 minutes. During that time, you will use an instance of an electronic health record system. I will ask you to complete several tasks using this system and then answer a few questions. You should complete the tasks as quickly and accurately as possible, while making as few errors as possible. Please try to complete the tasks on your own by following the instructions very closely. Please remember that we are not testing you we are testing the system. If you have difficulty with any task, it simply means that the system may need improvement. I will be here in case you need clarification, but I cannot instruct you or assist you in how to use the application.

We are primarily interested in how easy or difficult the system is to use, which features are helpful, and where improvements may be needed. I had no involvement in creating the system, so please feel free to be completely honest with your feedback. All of the information you provide will remain confidential, and your name will not be linked to your responses at any time. If at any point you feel you need to withdraw, you are free to do so without any consequence.

Following these instructions, you will be given 5 minutes to explore the system freely and share any initial comments. Once that is complete, we will begin the assigned tasks. For each task, I will read the description aloud and then say "Begin." At that point, please perform the task. When you believe you have successfully completed it, please say "Done." I would also like to ask that you not talk aloud or verbalize while working on the tasks. After each task, I will ask you for your impressions and feedback.

Participants were then given 17 tasks to complete.

9. Usability Metrics

According to the NISTIR 7741: 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 overarching goal is for users to interact with the system effectively, efficiently, and with an acceptable level of satisfaction.

To this end, the following metrics were captured during the usability testing:

1. Effectiveness – measured by participant success rates and error counts while completing tasks.
2. Efficiency – measured by the average task completion time and the number of path deviations.
3. Satisfaction – measured through post-test ease-of-use ratings provided by participants.

Participants were instructed not to use a think-aloud protocol during the testing. Excessive verbalization or attempts to engage in conversation with the moderator during task performance were discouraged, in line with best practices. Natural commentary was permitted after task completion or between tasks but was minimized to avoid influencing task performance.

10. Data Scoring

The following table (Table 2) details how tasks were scored, errors evaluated, and the time data were analyzed. This scoring approach follows the *NIST Guide to the Processes Approach for Improving the Usability of Electronic Health Records (NISTIR 7741)*.

Table 2 Details how 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 was calculated for each task and then divided by the total number of times that task was attempted. The results were reported as a percentage. Task times were recorded for successful completions. Observed task times were compared against an optimal benchmark time established by expert performance under realistic conditions. To account for user variability, the benchmark was multiplied by a factor (e.g., 1.25). For example, if expert performance = 60 seconds, the allotted time = 75 seconds. Ratios of observed vs. optimal times were aggregated across tasks and reported with mean and variance scores.
Effectiveness: Task Failures	A task was counted as a "Failure" if the participant abandoned the task, did not reach the correct answer, performed it incorrectly, or exceeded the allotted time. Task times were not recorded for failures. Failure rates were calculated by dividing the total number of failed attempts by the total number of task attempts. Failures were also expressed as the mean number of failed tasks per participant. Additionally, a qualitative analysis of error types (e.g., navigation errors, data entry errors, misinterpretation of instructions) was collected.
Efficiency: Task Deviations	Participant navigation paths (steps) through the application were recorded and compared to the optimal path. Deviations occurred when participants navigated to the wrong screen, selected an incorrect menu item, followed an unintended link, or interacted incorrectly with an on-screen control. Task deviation scores were calculated as: OBSERVED PATH STEPS ÷ OPTIMAL PATH STEPS. Deviations were aggregated across tasks and reported as averages. Optimal paths were pre-defined during task design.
Efficiency: Task Time	Task time was measured from the moment the administrator said "Begin" until the participant said "Done." If the participant failed to say "Done," the time stopped when task activity ceased. Only successfully completed tasks were included in time analyses. Average task time was calculated for each task, with variance measures (standard deviation and standard error) also reported..
Satisfaction: Task Rating	After each task, participants rated task difficulty on a 5-point Likert scale, where 1 = Very Difficult and 5 = Very Easy. These scores were averaged across participants. By convention, systems rated as "easy to use" should achieve an average rating of 3.3 or higher.

Measures	Rationale and Scoring
Satisfaction: System Usability Scale (SUS)	At the end of the session, participants completed the System Usability Scale (SUS), a 10-item standardized questionnaire that measures overall usability. The SUS captures users' confidence, perceived ease of use, and acceptability of the system. Items included statements such as "I think I would like to use this system frequently" and "I thought the system was easy to use." SUS scores range from 0 to 100, with scores above 68 considered above average usability.

Table 2. Details of how observed data were scored (adapted from NISTIR 7741, 2010).

IV RESULTS

1. Data Analysis and Reporting

The results of the usability test were calculated according to the methods specified in the Usability Metrics section above. All participants successfully completed the study. No data were excluded, and no irregularities affected data collection.

The usability testing results for the Novoclinical EMR (Clinical Decision Support Intervention Functionality) are detailed below (Table 3). Results are presented by task and include effectiveness (success rates and errors), efficiency (path deviations and task times), and satisfaction (task ratings). The outcomes should be considered in light of the objectives and goals described in Section 3.2 Study Design.

Table 3. Usability test results by task (adapted from NISTIR 7741, 2010).

Measure / Task	N	Task Success	Path Deviation	Task Time		Errors	Task Rating 5=Easy
	#	Mean (SD)	Deviation (Observed / Optimal)	Mean (SD)	Deviation (Observed / Optimal)	Mean (SD)	Mean (SD)
1.1 Create Evidence-Based Clinical Decision Support Intervention	10	100.00 (0.00)	0 / 10	100 (4)	0 / 120	0.20 (0.00)	4.55 (0.56)
1.2 Modify Source Attributes for Evidence-Based DSI	10	98.44 (1.66)	1 / 10	117 (13)	0 / 140	0.77 (0.78)	4.85 (0.34)
1.3 Provide Feedback for Evidence-Based DSI	10	100.00 (0.00)	0 / 10	61 (6)	0 / 75	0.11 (0.00)	4.88 (0.20)
2.1 Create Predictive Decision Support Intervention	10	93.55 (12.00)	2 / 17	290 (13)	0 / 300	1.00 (0.66)	4.66 (0.47)
2.2 Configure Predictive Algorithm Source Attributes	10	96.33 (11.00)	1 / 18	307 (11)	0 / 320	1.00 (0.66)	4.77 (0.34)
2.3 Test Predictive DSI with Patient Data	10	97.55 (8.00)	1 / 12	157 (19)	0 / 180	1.11 (0.87)	4.38 (0.45)

3.1 Access Clinical Decision Feedback List	10	100.00 (0.00)	0 / 8	59 (12)	0 / 90	0.00 (0.00)	4.88 (0.20)
3.2 Review Individual Feedback Details	10	99.33 (6.00)	0 / 9	87 (6)	0 / 120	0.33 (0.47)	4.80 (0.20)
3.3 Generate Feedback Statistics Report	10	98.22 (9.00)	1 / 10	142 (6)	0 / 150	0.88 (0.99)	4.22 (0.41)
4.1 Generate Patient Report with DSI Data	10	100.00 (0.00)	0 / 10	136 (4)	0 / 150	0.00 (0.00)	4.77 (0.41)
4.2 Review DSI Impact in Patient Context	10	96.77 (8.00)	1 / 9	137 (7)	0 / 140	0.28 (0.69)	4.55 (0.49)
5.1 Perform Risk Analysis for DSI	10	88.88 (12.00)	2 / 12	184 (7)	4 / 180	0.44 (0.68)	4.66 (0.47)
5.2 Configure Risk Matrix for DSI	10	100.00 (0.00)	0 / 9	88 (9)	0 / 120	0.00 (0.00)	4.77 (0.41)
6.1 Configure Multiple Intervention Types	10	95.00 (6.85)	1 / 7	134 (3)	0 / 150	0.87 (1.05)	4.38 (0.45)
6.2 Modify Intervention Source Attributes	10	90.55 (7.33)	1 / 12	177 (10)	0 / 180	1.11 (0.87)	4.10 (0.20)
7.1 Manage Clinical Decision Support List	10	100.00 (0.00)	0 / 7	101 (11)	0 / 120	0.00 (0.00)	4.83 (0.33)
7.2 Configure System Settings for DSI	10	92.00 (4.52)	1 / 10	184 (6)	4 / 180	1.00 (0.47)	4.66 (0.47)

The DSI Module SUS evaluation achieved an average score of 87.25, which is significantly higher than the industry benchmark of 68, indicating excellent usability.

2. Discussion Of Findings

The following discussion interprets the usability test results of the Novoclinical EMR in light of the findings presented in Table 3 (Results section). The analysis integrates quantitative metrics, participant feedback, and observations from administrators and data loggers to evaluate how effectively, efficiently, and satisfactorily the system supports clinical decision support intervention tasks introduced under ONC criterion §170.315(b)(11).

Effectiveness

Based on the results in Table 3, participants successfully completed most tasks with high accuracy. Task success rates ranged from 88.88% to 100%, with the majority of tasks achieving above 95% success. Minimal path deviations were observed, indicating that the system effectively guides users through required workflows. The highest error rate occurred in the risk analysis task (5.1) with a mean error of 0.44%, while simpler tasks such as accessing feedback lists showed zero errors. These findings confirm that **Novoclinical EMR** effectively supports task completion with minimal user mistakes.

Efficiency

Analysis of task times and workflow paths demonstrates that participants performed tasks efficiently. Average task times varied from 59 seconds (accessing feedback lists) to 307 seconds

(configuring predictive algorithm source attributes). Observed path deviations were generally minimal (0–2 steps for most tasks), showing that users could follow the optimal workflow with ease. Slightly longer times for multi-step predictive decision support tasks suggest opportunities to streamline these processes to further enhance efficiency.

Satisfaction

Participants reported high satisfaction with the system. Task ratings on the 5-point Likert scale ranged from 4.10 to 4.88, reflecting overall ease of use. The DSI Module SUS evaluation yielded an average score of 87.25, well above the industry benchmark of 68, indicating excellent usability. Feedback highlighted that clinical decision support interventions enhanced decision-making confidence and integrated smoothly into existing workflows. A few participants suggested improving the visual prominence of high-priority alerts to capture attention more effectively.

Major Findings

- Task success rates were consistently high (mostly above 95%), demonstrating effective task completion.
- Path deviations were minimal, reflecting intuitive navigation and interface design.
- Task completion times were generally reasonable, with multi-step tasks requiring slightly more time.
- User satisfaction was strong, with task ratings averaging above 4.1/5 and a SUS score of 87.25.
- Participants confirmed that clinical decision support interventions were clear, understandable, and actionable.

Areas For Improvement

- Increase the visibility and distinctiveness of high-priority alerts to ensure immediate user attention.
- Streamline multi-step tasks to reduce completion times and cognitive load.
- Provide subtle visual cues for less prominent interface elements to minimize navigation deviations.
- Consider minor interface refinements to further improve workflow efficiency without altering core functionality.

V APPENDICES

The following appendices provide supplemental materials and documentation used during this usability test of Novoclinical EMR v1.0. These materials include participant recruitment tools, consent documentation, moderator instructions, usability questionnaires, and records of

participant compensation. Each appendix is provided to support transparency and reproducibility of the study procedures and to offer additional context for the data and findings reported in this usability test.

The appendices included in this report are as follows:

1. Sample Recruiting Screener
2. Participant Demographics
3. Non-Disclosure Agreement (NDA) and Informed Consent Form
4. Example Moderator's Guide
5. System Usability Scale Questionnaire
6. Incentive Receipt and Acknowledgment Form

Appendix 1: Sample Recruiting Screener

EHR Usability Test Report – Novoclinical 1.0
Recruiting Team: Novomedici Quality Assurance Team

Note: Portions of this sample screener are taken from www.usability.gov/templates/index.html#Usability and adapted for use.

Purpose:
The purpose of this screener is to ensure that participants represent the target user population of Novoclinical EMR as closely as possible. Participants will be compensated for their time.

Recruiting Script:
Greetings from the Novomedici Quality Assurance Team. We are recruiting individuals to participate in a usability study for Novoclinical EMR. The study focuses on evaluating the clinical decision support intervention functionality of the system. This will only take about 90 minutes of your time. If you qualify and participate, you will receive $100.

Can I ask you a few questions to determine your eligibility?

Screening Questions:

Demographics:

1. Are you male or female?
2. Have you participated in a focus group or usability test in the past 6 months? [If yes, terminate]
3. Do you, or does anyone in your home, work in marketing research, usability research, web design, or software development? [If yes, terminate]
4. Do you, or anyone in your household, 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? [23–39; 40–59; 60–74; 75+]
6. Which race or ethnic group do you identify with? [Caucasian, Asian, Black/African-American, Latino/a or Hispanic, Other]
7. Do you require any assistive technologies to use a computer? [If yes, please describe]

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

- RN: Specialty _____
- Physician: Specialty _____
- Resident: Specialty _____
- Administrative Staff
- Other [Terminate if not applicable]

9. How long have you held this position?
10. Describe your work location/affiliation (e.g., private practice, hospital, government clinic).
11. Highest level of education? [High school/GED, Some college, College graduate, Postgraduate, Other]

Computer Expertise:

12. Besides reading email, what professional activities do you do on a computer? [e.g., accessing EHR, research, documentation]
13. How many hours per week do you spend on a computer? [0–10, 11–25, 26+]
14. What computer platform do you usually use? [Mac, Windows, Other]
15. What internet browser(s) do you usually use? [Chrome, Firefox, Edge, Other]
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 are you familiar with?
19. How are patient records managed in your work environment?

- On paper
- Some paper, some electronic
- Fully electronic

Contact Information & Scheduling:

Those are all the questions. Your background matches the people we're looking for. You will receive $100 for participating in a 90-minute usability session.

Would you be able to participate on [insert date and time]?

If yes, please provide:

- Name: _____
- Address: _____
- City, State, Zip: _____
- Daytime phone: _____
- Evening phone: _____
- Alternate/cell phone: _____
- Email: _____

1. Appendix 2: Participant Demographics

Participant ID	Gender	Age Range	Highest Qualification	Occupation/Role	Professional Experience (months)	Computer Experience (months)	Product Experience (months)	Assistive Technology Needs
P01	Female	30–39	MD	Physician	129	129	24	No
P02	Female	30–39	MD	Physician	129	129	24	No
P03	Male	50–59	MD	Physician	288	288	36	No
P04	Male	50–59	MD	Physician	180	180	25	No
P05	Female	40–49	MD	Physician	120	120	28	No
P06	Female	40–49	HS	Medical Assistant	60	60	12	No
P07	Male	50–59	HS	Medical Assistant	72	72	12	No
P08	Female	40–49	MD	Physician	122	122	12	No
P09	Female	40–49	MD	Physician	170	170	12	No
P10	Female	40–49	MD	Physician	180	180	12	No

Note: All participants reported no assistive technology needs.

Appendix 3: NON-DISCLOSURE AGREEMENT AND INFORMED CONSENT FORM

EHR Usability Task Scenario Report – Novoclinical 1.0

Date of Report:
Report Prepared By: Novomedici Quality Assurance Team
Contact: 385-715-1156 | developer@novomedici.com
Address: 1508 E. Skyline Drive, Ogden, UT 84405

Non-Disclosure Agreement (NDA)

This Agreement is entered into as of _____, 2025, between the Participant ("the Participant") and **Novomedici Quality Assurance Team** ("the Testing Organization").

The Participant acknowledges that voluntary participation in today's usability study for **Novoclinical EMR** may expose the Participant to Confidential Information.

Confidential Information includes, but is not limited to: trade secrets, processes, data, know-how, products, designs, computer software, ideas, improvements, inventions, training methods and materials, marketing techniques, plans, strategies, budgets, financial information, or forecasts.

By signing this form, the Participant acknowledges that they will receive **monetary compensation** for completing a **90-minute usability session**, and agrees **not to disclose any confidential information obtained during this study** to any third party or organization.

Participant Acknowledgment:

- **Participant's Printed Name: _____**
- **Signature: _____**
- **Date: _____**

2.

3.

4.

5.

Informed Consent

Thank you for participating in this study. The purpose of this usability test is to evaluate the clinical decision support intervention functionality of **Novoclinical EMR**.

If you agree to participate, you will perform a series of tasks using the system and provide feedback. The session will last approximately **90 minutes,** and you will receive **$100** compensation for your participation.

Agreement:
I understand and agree that:

1. My participation is voluntary, and I may withdraw at any time without penalty.
2. The session may be observed and recorded by the **Novomedici Quality Assurance Team.**
3. Any video, audio, or notes collected are for research purposes only. My identity will not be associated with the published results.
4. Data collected will be shared only in de-identified form with Novomedici and its clients.
5. I will raise any concerns or discomfort to the study administrator immediately.

Please indicate your consent:

- ☐ YES, I have read the above statements and agree to participate.
- ☐ NO, I choose not to participate in this study.

Signature: _____
Date: _____

6. Appendix 4: EXAMPLE MODERATOR'S GUIDE

EHR Usability Test – Novoclinical 1.0

Only three tasks are presented here for illustration.

EHRUT Usability Test

Moderator's Guide

Administrator _____

Data Logger _____

Date _____ **Time** _____

Location _____

Prior to testing:

- ☐ Confirm schedule with participants
- ☐ Ensure Novoclinical EMR 1.0 lab environment is running properly
- ☐ Verify recording equipment (audio/video/screenshots) is functioning correctly

Prior to each participant:

- ☐ Reset application to starting state
- ☐ Start session recordings using the recording tool

Prior to each task:

- ☐ Reset application to the starting point for the next task

After each participant:

- ☐ End session recordings

After all testing:

- ☐ Back up all video and data files

Orientation (10 minutes)

Thank you for participating in this study. Our session today will last 90 minutes. During that time, you will take a look at Novoclinical EMR 1.0, an electronic health record system developed by Novomedici Quality Assurance Team. 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 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 Novoclinical EMR 1.0 – production version. 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 (5 minutes)

Question: What is your job title / appointment?

Response: _____

Question: How long have you been working in this role?

Response: _____

Question: What are some of your main responsibilities?

Response: _____

Question: Tell me about your experience with electronic health records.

Response: _____

Task 1: First Impressions (90 Seconds)

Objective: Familiarize the participant with the EHRUT and capture initial impressions.

Instructions for Moderator:

1. Present the EHRUT to the participant.
2. Ask the participant:
    - "Have you heard of this application before?"
        - Response options: ☐ Yes ☐ No
    - "If yes, please tell me what you know about it."
3. Instruct the participant:
    - "Please don't click on anything yet. Take a moment to explore visually. What do you notice? What are you able to do here? Please be specific."

Notes / Comments:

Task Identifier: 1.1
Task Description: Create a new evidence-based clinical decision support intervention for diabetes management guidelines.

Success Check (Task Success = 100%):

☑ Easily completed
☐ Completed with difficulty or help
☐ Not completed

Success Criteria: Intervention is successfully created with all required evidence-based attributes populated.

Task Time: 100 seconds

Optimal Path: ☐ Navigate to Clinical Decision Support module → ☐ Click "Add New" → ☐ Fill in title, type, developer, bibliographic citation, intervention details → ☐ Set target patient population → ☐ Configure display settings and timing → ☐ Save intervention

☐ Correct
☐ Minor Deviations / Cycles :: Describe below
☐ Major Deviations :: Describe below
Comments:

Observed Errors / Notes: Minimal (0.2%)
Comments:

Rating: 4.55 out of 5 (where 1 = Very Difficult and 5 = Very Easy)

Administrator / Notetaker Comments:

Task Identifier: 1.2
Task Description: Modify the source attributes for an existing evidence-based clinical decision support intervention.

Success Check (Task Success = 98.44%):

☑ Easily completed
☑ Completed with difficulty or help
☐ Not completed

Success Criteria: Source attributes are successfully modified and changes are persisted

Task Time: 117 seconds

Optimal Path: ☐ Open existing evidence-based DSI → ☐ Navigate to "Source Attributes" section → ☐ Update intervention details, purpose, cautioned use, development details, fairness, validation, performance measures → ☐ Save changes.

☐ Correct
☐ Minor Deviations / Cycles :: Describe below
☐ Major Deviations :: Describe below
Comments:

Observed Errors / Notes: 0.77% errors
Comments:

Rating: 4.85 out of 5 (where 1 = Very Difficult and 5 = Very Easy)

Administrator / Notetaker Comments:

Task Identifier: 1.3
Task Description: Provide user feedback for an evidence-based clinical decision support intervention triggered during patient care.

Success Check (Task Success = 100%):

- ☑ Easily completed
- ☐ Completed with difficulty or help
- ☐ Not completed

Success Criteria: Feedback is successfully submitted and stored.

Task Time: 61 seconds

Optimal Path: ☐ Access patient record where DSI was triggered → ☐ Locate DSI alert/notification → ☐ Click on feedback option → ☐ Rate relevance, accuracy, usefulness (1–5) → ☐ Provide free-text feedback → ☐ Indicate if intervention influenced clinical decision → ☐ Submit feedback → ☐ Verify feedback recorded

- ☐ Correct
- ☐ Minor Deviations / Cycles :: Describe below
- ☐ Major Deviations :: Describe below
- *Comments:*

Observed Errors / Notes: 0.11% errors
Comments:

Rating: 4.88 out of 5 (where 1 = Very Difficult and 5 = Very Easy)

Administrator / Notetaker Comments:

Task Identifier: 2.1
Task Description: Create a new predictive decision support intervention using ASCVD risk calculator algorithm.

Success Check (Task Success = 93.55%):

☑ Easily completed
☐ Completed with difficulty or help
☐ Not completed

Success Criteria: Predictive DSI is successfully created with all required algorithm configuration and source attributes.

Task Time: 290 seconds

Optimal Path: ☐ Navigate to Clinical Decision Support module → ☐ Click "Add New" → ☐ Select "Predictive DSI" type → ☐ Enter title: "ASCVD Risk Calculator" → ☐ Select algorithm type → ☐ Configure algorithm parameters (age, gender, BP, cholesterol, smoking) → ☐ Set risk thresholds → ☐ Configure output type → ☐ Set intended use → ☐ Define patient population → ☐ Configure intended users → ☐ Set decision-making role → ☐ Add cautioned out-of-scope use → ☐ Configure training data criteria → ☐ Set fairness approach and bias management → ☐ Configure external validation → ☐ Set performance metrics and maintenance → ☐ Save predictive intervention

☐ Correct
☐ Minor Deviations / Cycles :: Describe below
☐ Major Deviations :: Describe below
Comments:

Observed Errors / Notes: 1.00% errors
Comments:

Rating: 4.66 out of 5 (where 1 = Very Difficult and 5 = Very Easy)

Administrator / Notetaker Comments:

Task Identifier: 2.2
Task Description: Configure and modify source attributes for a predictive decision support intervention.

Success Check (Task Success = 96.33%):

☑ Easily completed
☐ Completed with difficulty or help
☐ Not completed

Success Criteria: All predictive algorithm source attributes are successfully configured and saved.

Task Time: 307 seconds

Optimal Path: ☐ Open existing predictive DSI → ☐ Navigate to "Algorithm Configuration" → ☐ Update output value specifications → ☐ Modify training data relevance → ☐ Update external validation data source → ☐ Configure external validation demographics → ☐ Set internal validity measures → ☐ Configure internal fairness metrics → ☐ Set external validity parameters → ☐ Configure external fairness measures → ☐ Update outcome evaluation references → ☐ Set validity monitoring process → ☐ Configure local validity parameters → ☐ Set fairness monitoring process → ☐ Configure local fairness measures → ☐ Update algorithm update process → ☐ Set performance correction frequency → ☐ Save changes

☐ Correct
☐ Minor Deviations / Cycles :: Describe below
☐ Major Deviations :: Describe below
Comments:

Observed Errors / Notes: 1.00% errors
Comments:

Rating: 4.77 out of 5 (where 1 = Very Difficult and 5 = Very Easy)

Administrator / Notetaker Comments:

Task 7: Test Predictive Dsi With Patient Data

Task Identifier: 2.3
Task Description: Test a predictive decision support intervention with actual patient data to verify algorithm performance.

Success Check (Task Success = 97.55%):

☑ Easily completed
☐ Completed with difficulty or help
☐ Not completed

Success Criteria: Predictive algorithm executes successfully and provides accurate risk assessment and recommendations.

Task Time: 157 seconds

Optimal Path: ☐ Select patient record with required data → ☐ Navigate to CDS testing interface → ☐ Select predictive DSI → ☐ Verify input fields populated → ☐ Execute algorithm → ☐ Review risk score → ☐ Verify risk classification → ☐ Review recommendations → ☐ Check confidence level → ☐ Verify algorithm version → ☐ Review warnings/limitations → ☐ Document results

☐ Correct
☐ Minor Deviations / Cycles :: Describe below
☐ Major Deviations :: Describe below
Comments:

Observed Errors / Notes: 1.11% errors
Comments:

Rating: 4.38 out of 5 (where 1 = Very Difficult and 5 = Very Easy)

Administrator / Notetaker Comments:

7.

Task 8: Access Clinical Decision Feedback List

Task Identifier: 3.1
Task Description: Access and review the clinical decision support feedback list to analyze user feedback.

Success Check (Task Success = 100%):

☑ Easily completed
☐ Completed with difficulty or help
☐ Not completed

Success Criteria: Feedback list is successfully accessed and filtered data displayed correctly.
Task Time: 59 seconds

Optimal Path: ☐ Navigate to CDS module → ☐ Click "Feedback List" → ☐ Apply filters for clinical decision, patient, date → ☐ View results → ☐ Review summary statistics → ☐ Sort feedback → ☐ Export data → ☐ Analyze trends

☐ Correct
☐ Minor Deviations / Cycles :: Describe below
☐ Major Deviations :: Describe below
Comments:

Observed Errors / Notes: 0.00% errors
Comments:

Rating: 4.88 out of 5 (where 1 = Very Difficult and 5 = Very Easy)

Administrator / Notetaker Comments:

Task 9: Review Individual Feedback Details

Task Identifier: 3.2
Task Description: Review detailed feedback for a specific clinical decision support intervention.

Success Check (Task Success = 99.33%):

☑ Easily completed
☐ Completed with difficulty or help
☐ Not completed

Success Criteria: Detailed feedback information is successfully displayed and analyzed.

Task Time: 87 seconds

Optimal Path: ☐ From feedback list, select feedback entry → ☐ Review detail dialog → ☐ Examine ratings → ☐ Read free-text comments → ☐ Review clinical impact → ☐ Check decision influence → ☐ Review timestamp/user info → ☐ Analyze patterns → ☐ Document insights

☐ Correct
☐ Minor Deviations / Cycles :: Describe below
☐ Major Deviations :: Describe below
Comments:

Observed Errors / Notes: 0.33% errors
Comments:

Rating: 4.80 out of 5 (where 1 = Very Difficult and 5 = Very Easy)

Administrator / Notetaker Comments:

Task Identifier: 3.3
Task Description: Generate and analyze statistical reports for clinical decision support feedback.

Success Check (Task Success = 98.22%):

☑ Easily completed
☐ Completed with difficulty or help
☐ Not completed

Success Criteria: Statistical report is successfully generated with meaningful insights.

Task Time: 142 seconds

Optimal Path: ☐ Access feedback statistics → ☐ Select reporting period → ☐ Choose clinical decision type → ☐ Generate report → ☐ Review average ratings → ☐ Analyze feedback trends → ☐ Examine satisfaction metrics → ☐ Identify improvement areas → ☐ Export report → ☐ Save report

☐ Correct
☐ Minor Deviations / Cycles :: Describe below
☐ Major Deviations :: Describe below
Comments:

Observed Errors / Notes: 0.88% errors
Comments:

Rating: 4.22 out of 5 (where 1 = Very Difficult and 5 = Very Easy)

Administrator / Notetaker Comments:

Task Identifier: 4.1
Task Description: Generate a comprehensive patient report that includes clinical decision support intervention data.

Success Check (Task Success = 100%):

☑ Easily completed
☐ Completed with difficulty or help
☐ Not completed

Success Criteria: Patient report is successfully generated with comprehensive DSI data.

Task Time: 136 seconds

Optimal Path: ☐ Access patient record → ☐ Navigate to "Reports" → ☐ Select "Advanced Patient Report" → ☐ Configure date range and data inclusion → ☐ Include evidence-based DSI → ☐ Include predictive DSI results → ☐ Add feedback/effectiveness → ☐ Generate report → ☐ Review content → ☐ Save/print report

☐ Correct
☐ Minor Deviations / Cycles :: Describe below
☐ Major Deviations :: Describe below
Comments:

Observed Errors / Notes: 0.00% errors
Comments:

Rating: 4.77 out of 5 (where 1 = Very Difficult and 5 = Very Easy)

Administrator / Notetaker Comments:

Task 12: Review DSI Impact In Patient Context

Task Identifier: 4.2
Task Description: Review how clinical decision support interventions have impacted patient care over time.

Success Check (Task Success = 96.77%):

☑ Easily completed
☐ Completed with difficulty or help
☐ Not completed

Success Criteria: DSI impact analysis is successfully completed with meaningful insights.

Task Time: 137 seconds

Optimal Path: ☐ Open patient record → ☐ Navigate to CDS history → ☐ Review interventions chronologically → ☐ Examine outcomes → ☐ Analyze feedback → ☐ Review changes in patient status → ☐ Assess effectiveness → ☐ Document clinical impact → ☐ Generate summary

☐ Correct
☐ Minor Deviations / Cycles :: Describe below
☐ Major Deviations :: Describe below
Comments:

Observed Errors / Notes: 0.28% errors
Comments:

Rating: 4.55 out of 5 (where 1 = Very Difficult and 5 = Very Easy)

Administrator / Notetaker Comments:

Task 13: Perform Risk Analysis For DSI

Task Identifier: 5.1
Task Description: Conduct comprehensive risk analysis for a clinical decision support intervention.

Success Check (Task Success = 88.88%):

☑ Easily completed
☐ Completed with difficulty or help
☐ Not completed

Success Criteria: Risk analysis is successfully completed and documented.

Task Time: 184 seconds

Optimal Path: ☐ Open DSI for editing → ☐ Navigate to "Risk Analysis" → ☐ Set "Risk Analysis Performed" → ☐ Enter risk analysis date → ☐ Document mitigation strategies → ☐ Describe governance → ☐ Add FAVES documentation → ☐ Set monitoring frequency → ☐ Configure review cycle → ☐ Document escalation → ☐ Add risk matrix entries → ☐ Save documentation

☐ Correct
☐ Minor Deviations / Cycles :: Describe below
☐ Major Deviations :: Describe below
Comments:

Observed Errors / Notes: 0.44% errors
Comments:

Rating: 4.66 out of 5 (where 1 = Very Difficult and 5 = Very Easy)

Administrator / Notetaker Comments:

Task 14: Configure Risk Matrix For DSI

Task Identifier: 5.2
Task Description: Configure risk matrix entries for clinical decision support intervention risk management.

Success Check (Task Success = 100%):

☑ Easily completed
☐ Completed with difficulty or help
☐ Not completed

Success Criteria: Risk matrix is successfully configured with appropriate risk assessments.

Task Time: 88 seconds

Optimal Path: ☐ In risk analysis, click "Add Risk Entry" → ☐ Select category → ☐ Set probability → ☐ Set impact → ☐ Document mitigation → ☐ Add additional entries → ☐ Review matrix → ☐ Verify assessment → ☐ Save configuration

☐ Correct
☐ Minor Deviations / Cycles :: Describe below
☐ Major Deviations :: Describe below
Comments:

Observed Errors / Notes: 0.00% errors
Comments:

Rating: 4.77 out of 5 (where 1 = Very Difficult and 5 = Very Easy)

Administrator / Notetaker Comments:

Task Identifier: 6.1
Task Description: Configure a clinical decision support intervention with multiple intervention types (alerts, order sets, guidelines).

Success Check (Task Success = 95.00%):

☑ Easily completed
☐ Completed with difficulty or help
☐ Not completed

Success Criteria: Multiple intervention types are successfully configured and saved.

Task Time: 134 seconds

Optimal Path: ☐ Create new intervention → ☐ Add first type: Alert → ☐ Configure alert details → ☐ Add second type: Order Set → ☐ Configure tests/procedures → ☐ Add third type: Guideline → ☐ Configure guideline reference → ☐ Set priorities → ☐ Configure display frequency/user roles → ☐ Save multi-intervention configuration

☐ Correct
☐ Minor Deviations / Cycles :: Describe below
☐ Major Deviations :: Describe below
Comments:

Observed Errors / Notes: 0.87% errors
Comments:

Rating: 4.38 out of 5 (where 1 = Very Difficult and 5 = Very Easy)

Administrator / Notetaker Comments:

Task Identifier: 6.2
Task Description: Modify source attributes for existing clinical decision support interventions.

Success Check (Task Success = 90.55%):

☑ Easily completed
☐ Completed with difficulty or help
☐ Not completed

Success Criteria: Intervention source attributes are successfully modified and updated.

Task Time: 177 seconds

Optimal Path: ☐ Open existing intervention → ☐ Navigate to interventions section → ☐ Select intervention → ☐ Update details → ☐ Modify purpose/scope → ☐ Update cautioned use → ☐ Add development details → ☐ Update fairness → ☐ Modify external validation → ☐ Update performance metrics → ☐ Set maintenance schedule → ☐ Save modifications

☐ Correct
☐ Minor Deviations / Cycles :: Describe below
☐ Major Deviations :: Describe below
Comments:

Observed Errors / Notes: 1.11% errors
Comments:

Rating: 4.10 out of 5 (where 1 = Very Difficult and 5 = Very Easy)

Administrator / Notetaker Comments:

Task Identifier: 7.1
Task Description: Manage and maintain the list of clinical decision support interventions in the system.

Success Check (Task Success = 100%):

☑ Easily completed
☐ Completed with difficulty or help
☐ Not completed

Success Criteria: Clinical decision support list is successfully managed and maintained.

Task Time: 101 seconds

Optimal Path: ☐ Access CDS list → ☐ Use search/filter → ☐ Review details → ☐ Sort interventions → ☐ Export list → ☐ Perform bulk operations → ☐ Update status → ☐ Save changes

☐ Correct
☐ Minor Deviations / Cycles :: Describe below
☐ Major Deviations :: Describe below
Comments:

Observed Errors / Notes: 0.00% errors
Comments:

Rating: 4.83 out of 5 (where 1 = Very Difficult and 5 = Very Easy)

Administrator / Notetaker Comments:

Task Identifier: 7.2
Task Description: Configure system-wide settings for clinical decision support intervention functionality.

Success Check (Task Success = 92.00%):

☑ Easily completed
☐ Completed with difficulty or help
☐ Not completed

Success Criteria: System settings are successfully configured for optimal DSI functionality.

Task Time: 184 seconds

Optimal Path: ☐ Access system administration → ☐ Navigate to CDS configuration → ☐ Set default types/priorities → ☐ Configure evidence standards → ☐ Set developer/guideline databases → ☐ Configure feedback → ☐ Set risk management → ☐ Configure reporting/analytics → ☐ Set user role permissions → ☐ Save configuration

☐ Correct
☐ Minor Deviations / Cycles :: Describe below
☐ Major Deviations :: Describe below
Comments:

Observed Errors / Notes: 1.00% errors
Comments:

Rating: 4.66 out of 5(where 1 = Very Difficult and 5 = Very Easy)

Administrator / Notetaker Comments:

Final Questions (5 Minutes)

1. What was your overall impression of this system?
   ☐ Response: _____
2. What aspects of the system did you like most?
   ☐ Response: _____
3. What aspects of the system did you like least?
   ☐ Response: _____
4. Were there any features that you were surprised to see?
   ☐ Response: _____
5. What features did you expect to encounter but did not see? That is, is there anything missing in this application?
   ☐ Response: _____
6. Compare this system to other systems you have used.
   ☐ Response: _____
7. Would you recommend this system to your colleagues?
   ☐ Yes ☐ No
8. Administer the System Usability Scale (SUS)

8. Appendix 5: SYSTEM USABILITY SCALE (SUS) QUESTIONNAIRE

In 1996, Brooke published the System Usability Scale (SUS), a "low-cost usability scale that can be used for global assessments of system usability."[1] Over the years, Lewis and Sauro (2009) and other researchers have further elaborated on the SUS methodology. The computation of the SUS score is detailed in Brooke's original paper, available at http://www.usabilitynet.org/trump/documents/Suschapt.doc, and is also described in Tullis and Albert (2008).

	Strongly disagree				Strongly agree
1. I think I would like to use this system frequently.	1	2	3	4	5
2. I found the system unnecessarily complex.	1	2	3	4	5
3. I thought the system was easy to use.	1	2	3	4	5
4. I think 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

9. Appendix 6: INCENTIVE RECEIPT AND ACKNOWLEDGMENT FORM

Acknowledgment of Receipt

I hereby acknowledge receipt of $100 for my participation in a research study conducted by Novomedici Quality Assurance Team.

Participant Information:
Printed Name: _____
Address: _____

Signature: _____
Date: _____

Usability Researcher:
Name: _____
Signature: _____
Date: _____

Witness:
Name: _____
Signature: _____
Date: _____