Usability Veracity Attestation

September 14, 2017

Afoundria, LLC
ChartPath Version 1.27

Charles Owen, MD
5114 Balcones Woods Drive
Ste 307-348
Austin, TX 78759

For public release:

Afoundria, LLC attests that the usability standard/process and usability report submitted for the certification of ChartPath Version 1.27 is accurate and complete per the requirements of the ONC criterion 170.315(g)(3).

Charles B. "Buddy" Owen, MD
Chief Medical Information Officer and Product Manager of ChartPath
Signed September 14, 2017

Attestation: User-Centered Design Process

September 14, 2017

Afoundria, LLC
ChartPath Version 1.27

Charles Owen, MD
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Austin, TX 78759

For public release:

Afoundria, LLC used the following usability design industry standard / process in developing and designing their health IT module, Afoundria's ChartPath Version 1.27:

IS 9241-11 Guidance on Usability
https://www.iso.org/standard/16883.html

Charles B."Buddy" Owen, MD
Chief Medical Information Officer and Product Manager of ChartPath
Signed September 14, 2017

EHR Usability Test Report of ChartPath Version 1.26

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

Product Tested:	ChartPath Version 1.27
Date of Usability Test:	Testing: between March 15, 2017 and September 12, 2017
Date of Report:	Final Report Date: September 14, 2017
Report Prepared By:	Charles B. Owen, M.D. Chief Medical Information Officer and Product Manager Afoundria, L.L.C. 3901 Spicewood Springs Road Austin, TX 78759

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EXECUTIVE SUMMARY

A usability test of **ChartPath Version 1.27** was conducted between March 15 and September 12, 2017 by Afoundria, L.L.C.. The purpose of this test was to test and validate the usability of the current user interface, and provide evidence of usability in the EHR Under Test (EHRUT). During the usability test, 10 – 12 current and prospective users of the EHRUT matching the target demographic criteria served as participants and used the EHRUT in simulated, but representative tasks.

This study collected performance data on the following functions, which require testing for an EHR seeking CEHRT Certification:

a.5	Demographics
a.6	Problem List
a.8	Medication Allergy List
a.7	Medication List
a.2	CPOE Labs
a.9	Clinical Decision Support
a.14	Implantable Device List
b.2	Clinical Information Reconciliation and Incorporation

Each one-on-one usability test was conducted over 45 to 90 minutes. Some participants had prior experience with the EHR.

- Each participant was greeted by the administrator.
- They were instructed that they could withdraw at any time.
- 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 recorded user interactions (screen capture) in order to measure user performance.
- The administrator did not give the participant assistance in how to complete the task.

Participant screens, head shots and audio were recorded for subsequent analysis.

The following types of data were collected for each participant:

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

All participant data was de-identified – no correspondence could be made from the identity of the participant to the data collected. Following the conclusion of the testing, participants were asked to complete a post-test questionnaire. Test subjects were not compensated in any fashion. 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.

Particpant Summary

Participant Identifier	Participant Gender	Participant Age	Participant Education	Participant Occupation/Role	Participant Professional Experience	Participant Computer Experience	Participant Product Experience	Participant Assistive Technology Needs
001	Female	40-49	Master's Degree	Client Services	0	180	30	No
002	Male	60-69	Doctorate degree (e.g., MD, DNP, DMD, PhD)	CMIO, Product Manager, BCCI	420	400	46	No
003	Male	30-39	Some college credit, no degree	Customer Support	0	240	36	No
004	Female	30-39	Bachelor's degree	Scribe	0	220	0	No
005	Female	50-59	Bachelor's degree	Executive Assistant	0	240	0	No
006	Male	50-59	Bachelor's degree	Software Developer	0	240	0	No
007	Male	30-39	Bachelor's degree	Videographer	0	220	0	No
008	Female	20-29	Bachelor's degree	ED Nurse	33	60	2	No
009	Male	50-59	Bachelor's degree	ED Nurse	69	122	2	No
010	Female	30-39	Bachelor's degree	ED Nurse	98	116	0	No
011	Female	40-49	Master's Degree	ED/PAC Nurse	133	145	1	No
012	Male	60-69	Bachelor's degree	ED/PAC Nurse	150	150	0	No

The results from the System Usability Scale scored the subjective satisfaction with the system based on performance with these tasks to be quite high, with the exception of items where the level of detail exceeded what the clinical participants deemed to be appropriate with respect to clinical import. This observation was not made by non-clinical test subject but they did object to excessive details and were frustrated by the lack of clinical context.

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

Major findings:

- Clinical test subjects were anxious to develop workflow that assured them of having the detailed clinical data immediately at hand when faced with the task requiring specific details. This was particularly true with testing of functions such as Medications (with details of dose, frequency, start and stop date) and Problem list (active or not, start date, resolved date)
- Test Subjects asked for reducing the need to transfer from keyboard to mouse frequently. Experienced users particularly preferred the ability to do entry with the keyboard only.
- All test subjects experienced some frustration with “screen jumps” – a phenomena where the visual display makes a sudden move to reorient the cursor to the middle of the page, leaving the test subject disoriented as to the cursor position.
- Many test subjects commented in the later portions of testing that they now understood something that was confusing before. For example how to create a new note and begin to edit that note. It may be useful to provide more consistent pre-test training, or simply to measure a users familarity and experience with the EHR as part of the testing. We don’t want to lose the value of having “naïve” users provide their input but at the same time, our goal is to optimize primarily for use by experienced users.

INTRODUCTION

The EHRUT(s) tested for this study was ChartPath Version 1.27. ChartPath is designed to present medical information to healthcare providers in the post-acute and long term care (PALTC) setting. 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 were captured during the usability testing.

METHOD

PARTICIPANTS

A total of 12 participants were tested on the EHRUT(s). Participants in the test were clinicians and lay users, including individuals that might act as scribes or EHR administrators. Participants were recruited by Afoundria, LLC and were not compensated for their time. In addition, participants had no direct connection to the development of or organization producing the EHRUT(s). Participants were not from the testing or supplier organization. Participants were given the opportunity to have the same orientation and level of training as the actual end users would receive. Test Subject characteristics were identified and recorded.

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

Testing sessions of 45 to 90 minutes were conducted. A spreadsheet was used to keep track of the participant schedule, and included each participant's demographic characteristics. 12

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 solely with the tested version of the software, ChartPath 1.27. The location of the testing was dependent on the needs of the test subject. Some sessions were remote and other in person. All Test Subjects were given the same instructions (see Appendix 4 – Moderater's Guide). 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 the section on Usability Metrics.

TASKS

A number of tasks were constructed that would be realistic and representative of the kinds of activities a user might do with this EHR. All tasks ("Steps") are listed in the accompanying Moderater's Guide (Appendix 4).

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.

TEST LOCATION AND ENVIRONENT

Usability and Safety Enhanced Design testing was performed in both face-to-face and web-based sessions. In both circumstances the testing was recorded. Remote Test Subjects were asked to find a location that was quiet, comfortable and free from distractions for the duration of the testing. Test Subjects that were in a face-to-face setting were provided with the same environment.

The screen capture software recorded both user activity (continuous screen capture) and web-cam video of the test subject. Additionally, the screen capture software displayed a timer with precision to the tenth of a second. This setup allowed the Moderater to concentrate on simple, clear, and concise instructions.

PROCEDURES

Appendix 4 provides the Moderater's Guide. The Moderators Guide includes a written Script that was followed in order to establish consistency in the instructions to Test Subjects. The Script includes Steps that correspond to the User Interactions that are the focus of SED / Usability testing. These Steps were subjected to formal evaluation according to ONC requirements. In addition to these Steps, the Test Scenarios include some contextual information that is important to the flow of the ChartPath application.

The following instructional and training videos were created for purposes of providing consistent context for test subjects.

Orientation Videos:

- ☐ Patient Census
- ☐ Patient Registration
- ☐ Chart Creation: First Chart
- ☐ Chart Creation: Pull Forward

Training Videos:

- ☐ Patient Census
- ☐ Patient Registration
- ☐ Create a Note – New
- ☐ Create a Note – Pull Forward

Test Subjects were instructed to perform the Steps:

- 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.
- Test Subjects were encouraged to talk about their experiences and this feedback was recorded.

Test scenario data was provided to Test Subject in both written and electronic form consistent with the anticipated format that "real" data might be available for use. Some Test Steps specified the format to be used and other Steps allowed the Test Subject to choose how they would input Scenario data.

Following the session, the administrator gave the participant the post-test questionnaire (e.g., the System Usability Scale and thanked each individual for their participation. Participants' demographic information was recorded.

Results of testing were gathered from the recorded sessions after completion of the test session. All data specified by the SED Testing requirements including task success rate, time on task, errors, deviations, and verbal feedback was gathered and entered into a spreadsheet supplied by the Authorized Testing Body. Post-test questionnaires were recorded into a spreadsheet.

TEST ENVIRONMENT

The EHRUT would be typically be used in a Post-Acute and Long Term Care facility. In this instance, the testing was conducted in person, in an office environment. For testing, the computer used was a laptop, running windows and Chrome. . The participants used a mouse and keyboard when interacting with the EHRUT.

The EHRUT used a browser running at 1280x1024 resolution. The application was set up by the the Afoundria proctor according to the vendor's normal setup and run over a VPN and WAN connection. Technically, the system performance (i.e., response time) was representative of 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).

TEST FORMS AND TOOLS

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

1. Informed Consent
2. Moderator's Guide
3. Incentive Receipt and Acknowledgment Form

Examples of these documents can be found in Appendices. The Moderator's Guide was devised so as to be able to prompt test subjects in a repeatable fashion and to ensure the ability 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 cam was running and a headset was used to capture verbal feedback. Recordings of the sessions were used to capture the data.

PARTICIPANT INSTRUCTIONS

A comprehensive script for the Test Proctor is provided in an Appendix.

Tasks are listed in the moderator's guide in Appendix [B4].

USABILITY METRICS

According to the NIST Guide to the Processes Approach for Improving the Usability of Electronic Health Records, EHRs should support a process that provides a high level of usability for all users. The goal is for users to interact with the system effectively, efficiently, and with an acceptable level of satisfaction. To this end, metrics for effectiveness, efficiency and user satisfaction were captured during the usability testing.

The goals of the test were to assess:

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

DATA SCORING

The following table (Table [x]) details how tasks were scored, errors evaluated, and the time data analyzed.1

Measures	Rationale and Scoring
Effectiveness: Task Success	A task was counted as a "Success" if the participant was able to achieve the correct outcome. The total number of successes were calculated for each task and then divided by the total number of times that task was attempted. The results are provided as a percentage. Task times were recorded for successes. Observed task times divided by the optimal time for each task is a measure of optimal efficiency. Optimal task performance time was generated by timing the Tasks / Steps as performed by expert users under conditions identical to those experienced by the test subjects..
Effectiveness: Task Failures	Final output was captured and compared with the Expert-generated data. Each variance from the Expert chart was considered an error. Not all deviations would be counted as errors. When errors were encountered they were classified by type (ommision, erroneous data, typographical errors, etc.) and summarized.
Efficiency: Task Deviations	Optimal Paths to complete the tested functions were determined by examining the path taken by at least two Expert Users. When the path taken by Experts were different, these Experts got together and reconciled the differences to arrive at an Optimal Path. 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.
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. [12] To measure participants' confidence in and likeability of the EHRUT overall, the testing team asked a series of post-test questions. The questions are included in the Test Moderator script.

RESULTS

DATA ANALYSIS AND REPORTING

The results of the usability test were calculated according to the methods specified in the Usability Metrics section above. Participants who failed to follow session and task instructions had their data excluded from the analyses.

The usability testing results for the EHRUT are summarized below. Detailed data tables accompany this report.

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.

Component	Effectiveness (Success)	Efficiency (Time & Path)	Satisfaction
Demographics	Characterized by high levels of success with few errors.	Rapid completion of tasks and self-correction of errors demonstrated.	High level of user satisfaction, although some frustration with "extraneous" data.
Problem List	Variable levels of success. Desire to increase use of "pseudonyms" or aliases.	Very rapid learning and adoption of "most efficient" path. Tendency for speed to increase during testing with subsequent entries.	High satisfaction with use, but with desire for expanding the "vocabulary" of the application.
Medication Allergy List	High level of success	Highly variable time to complete tasks and several alternative pathways.	Moderate frustration with multiple paths to the same result.
Medication List	Highly variable success depending on the method of information entry.	Highly variable efficiency, similarly dependent on the method of data entry.	Poor satisfaction with detailed data collection "from scratch". Universal appeal of copying from existing electronic format.
CPOE Labs	Quick and simple entry with few errors. Lack of standardization of the lexicon somewhat bothersome.	Overall very quick and simple with consistent use by test subjects.	High satisfaction with task.
Clinical Decision Support	Users quickly come to understand the function and anticipate its utility.	n/a – Users are mostly "passive" recipients of this information that is generated automatically by the application.	Test subjects see a great deal of utility to this functionality and are anxious to implement this feature.
Implantable Device List	High level of success with task.	Quick and efficient. Low learning curve.	Test subjects largely fail to see the "value" of the data except in very limited clinical circumstances. (Pacemakers, heart valves, etc.)
Clinical Information Reconciliation and Incorporation	Very challenging task and highly variable success rates. Heavily dependent on users clinical experience.	Speed and reproducibility accelerates with subsequent use.	Users frustrated when data is more extensive and detailed. More satisfaction with less detailed data.

The results from the Likert Usability / Satisfaction measure scored the subjective satisfaction with the system based on performance with these tasks to be quite high. Broadly interpreted, scores under 3 represent systems with poor usability; scores over 3 would be considered above average.

DISCUSSION OF THE FINDINGS

a.5 Demographics

Efficiency

- High efficiency with rapid learning curve

Effectiveness

- High effectiveness given the “pick from list” nature of most of the data entry.
- Need for improved error checking and duplicate entry resolution

Satisfaction

- High level of satisfaction but with request to limit amount of details required.

a.6 Problem List

Efficiency

- High level of efficiency once aliases, synonyms, and short cuts introduced.

Effectiveness

- High effectiveness except with complex conditions and high levels of specificity. e.g. diabetes and orthopedic problems. Reflects the complexity of ICD-10 coding.

Satisfaction

- Desire for assistance with entry of complex clinical problems.
- Request for some aids to detailed problem definition needed.

a.8 Medication Allergy List

Efficiency

- High efficiency. No problems or issues.

Effectiveness

- Highly effective.

Satisfaction

- Clinical coding issues frequenty problematic. e.g. how to code a patient’s expression of an allergy to “mycins”. This problem is primarily clinical, but results in frustrations with the computer requirement for definitive coding.

a.7 Medication List

Efficiency

- Simple med lists extremely efficient.
- The more details of the medicaiton that are required, the more time is required. (Refected in User Satisfaction ratings as well.)

Effectiveness

- Effectiveness seems to drop off as more medications are entered. Probably reflects user frustration with the time to enter detailed data AND the feeling that most of the data is for purposed of “feeding the computer” and not providing clinically relevant and important data.

Satisfaction

- Satisfaction drops off significantly as the volume of required data increases.

a.2 CPOE Labs

Efficiency

- Higly efficient

Effectiveness

- Few mistakes, and those typically generated by list items that are unfamiliar to the users. Reflects a lack of a definitive terminology or lexicon for lab test items.

Satisfaction

- High level of satisfaction among users.

a.9 Clinical Decision Support

Efficiency

- There is a sharp learning curve. Users were initially anxious and frustrated with the interface, but most experienced an “ahah!” moment, after which interactions were much more effiicient (and satisfying).

Effectiveness

- Difficult to judge in a testing environment, but most users expressed a desire to use this capability in practice.

Satisfaction

- High sense of anticipation – looking forward to practical use.

a.14 Implantable Device List

Efficiency

- Very efficient.

Effectiveness

- No errors in the admittedly artificial test environment.

Satisfaction

- Good satisfaction with the application, but a very limited view of the applicability of the function.

b.2 Clinical Information Reconciliation and Incorporation

Efficiency

- Very steep learning curve.
- Many test scenarios necessary in order to give users familiary with how to reconcile data.

Effectiveness

- Difficulty in easily viewing a “summary” level of changes and reconciliation frustrates the ultimate effectiveness.
- Highly prone to errors as the data is complex and the interface necessarily difficult to train on.

Satisfaction

- Lowest level of satisfaction among all functions, but optimism as to ultimate utility “in the field”.

MAJOR FINDINGS

- There is a significant difference in usability based on clinical experience. This has an impact on the quality, consistency, and accuracy of the data recorded.
- User training needs to be more rigorous with defined metrics and a formal curriculum, as well as proficiency testing.
- Some attention needs to be given to differences in use and usability between different devices and input (pads, versus laptops, versus desktop.)

AREAS FOR IMPROVEMENT

- Reduce movement from keyboard to mouse and back.
- Improve the “refresh” of the display to avoid disorienting the user
- improve “search” and enter capabilities.
- Revise and refine the reconciliation process to provide more context for before and after data.

APPENDICES

The following appendices include supplemental data for this usability test report. Following is a list of the appendices provided:

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: Participant Solicitation

Recruiting Solicitation Letter

Greetings from Dr. Charles Owen, CMIO and Product Manager of Afoundria.

As you are likely aware, Afoundria is working to certify ChartPath as 2015 Certified EHR Technology, or CEHRT. Doing so is a requisite step in optimizing ChartPath for the Merit-Based Incentive Pay System, or MIPS. We intend to certify ChartPath this summer AND configure it to assist our customers in achieving the highest possible MIPS scores, thereby increasing their practice revenues while improving the efficiency and efficacy of your clinical practice.

We are recruiting individuals to participate in Usability Testing of ChartPath. This Usability Testing, mandated under §170.315(g)(3) of the ONC Certification process, requires that user-centered design (UCD) processes are applied to specific functional components of each EHR seeking certification. For those who are interested, I have attached a list of those ONC criteria that are subject to Usability Testing.

I would like to ask you to consider helping us and future users of the product by participating as a Usability Tester. You have been identified by Donovan or Brenda as an ideal candidate by virtue of your previous work with ChartPath. The testing criteria are fairly detailed and rigorous, but we have made the Usability Testing simple, quick, and, we hope, even fun. Here is what we are asking of you if you agree to be a Usability Tester:

- Respond to a simple online survey that identifies you as a user, or potential user of ChartPath AND solicits some simple demographic information so we can assure a broad and diverse group of testers. (See the attached Usability Tester Survey Questions.)
- Schedule a time between now and May 15 to join one of our Testers (most likely me, Donovan, or Brenda) in a 60 to 90 minute recorded online webinar. Our schedule is flexible. We will be happy to do nights, weekends, early mornings – whatever works for you!
- The Testing Session will be fairly “scripted”. After a brief orientation, we will talk you through several patient encounters and record your use of ChartPath to document the information specified in the ONC Usability Testing Criteria.

That all there is to it! We will be analyzing your use of ChartPath as well as you verbal and non-verbal reactions to using the software. Your feedback will be reviewed and will be part of the reporting to the Authorized Testing Laboratory that will be working with us to achieve certification.

We plan on making this type of Usability Testing a regular and recurring facet of our development process. We value your assistance in making sure that ChartPath charting remains simple, intuitive, and fast, even as we all experience the increasing data requirements of MIPS and other Value-Based Payment initiatives.

I sincerely hope you will help us with this important component of certification. Your participation can help make this process but substantive and meaningful.

Sincerely,

Charles B. Owen, M.D.

charles@afoundria.com
(512) 589-5965
Chief Medical Information Officer & Product Manager
Afoundria, LLC

ONC Usability Testing Criteria:

§ 170.315 (a)(2) CPOE – laboratory

§ 170.315 (a)(5) Demographics

§ 170.315 (a)(6) Problem List

§ 170.315 (a)(7) Medication List

§ 170.315 (a)(8) Medication Allergy List

§ 170.315 (a)(9) Clinical Decision Support

§ 170.315 (a)(14) Implantable Device List

§ 170.315 (b)(2) Clinical Information Reconciliation and Incorporation

Usability Tester Survey Questions:

Contact Information

- Name of participant:
- Address:
- City, State, Zip:
- Daytime phone number:
- Evening phone number:
- Alternate [cell] phone number:
- Email address:

Demographics

1. Sex [M/F/U]
2. Have you participated in a focus group or usability test in the past 12 months? [Y/N]
3. Do you work in marketing research, usability research, web design, or other related field? [Y/N]
4. Do you have a commercial or research interest in an electronic health record software or consulting company? [Y/N]
5. Which of the following best describes your age? [23 to 39; 40 to 59; 60 - to 74; 75 and older]
6. Which of the following best describes your race or ethnic group? [e.g., Caucasian, Asian, Black/African-American, Latino/a or Hispanic]
7. Do you require any assistive technologies to use a computer? [Y/N]

Professional Demographics

8. What is your current position and title?
    - Nurse: Certification and Specialization
    - Physician: Specialty
    - Scribe / Other Physician Extender
    - Administrative Staff
    - Other (Specify)
9. How long have you held this position?
10. Describe your work location (or affiliation) and environment?
11. Which of the following describes your highest level of education?

Computer Expertise

12. Besides reading email, what professional activities do you do on the computer? [e.g., access EHR, research; reading news; shopping/banking; digital pictures; programming/word processing, etc.]
13. About how many hours per week do you spend on the computer? [0 to 10, 11 to 25, 26+ hours per week]
14. What computer platform do you usually use? [e.g., Mac, Windows, etc.]
15. What Internet browser(s) do you usually use? [e.g., Firefox, IE, AOL, etc.]
16. In the last month, how often have you used an electronic health record?
17. How many years have you used an electronic health record?
18. How many EHRs do you use or are you familiar with?
19. How does your work environment patient records? [Recruit according to the demographics of the intended users]
    - On paper
    - Some paper, some electronic
    - All electronic

Appendix 2: PARTICIPANT DEMOGRAPHICS

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

Gender

Men	6
Women	6
Total (participants)	12

Occupation/Role

RN/BSN	5
Physician	1
Admin Staff and Scribes	6
Total (participants)	12

ID	Role	Job	Computer Experience	Clinical Experience	ChartPath Experience	a5 demographics	a6 problem list	a8 allergies	a7 meds list	a2 order labs	a9 CDS	a14 devices	b2 reconcile
001	CPSupport	Af Operations	5	3	5	X	X	X	X		X	X	
002	CPSupport	Af Product	5	5	4	X	X	X	X	X	X	X	X
003	CPSupport	CP Support	5	3	5	X	X	X	X	X	X	X	X
004	Scribe	Fitness / Physical	4	3	1	X	X	X	X			X	
005	Other	Executive Assistant	3	0	1	X	X	X	X	X	X	X	X
006	Dev	Developer (non-Af)	5	0	0	X	X	X	X	X	X	X	X
007	Scribe	Videographer	5	2	2	X	X	X	X	X	X	X	X
008	Extender	ED Nurse	4	4	0	X	X	X	X	X	X	X	X
009	Extender	ED Nurse	4	4	0	X	X	X	X	X	X	X	X
010	Extender	ED Nurse	4	4	0	X	X	X	X	X	X	X	X
011	Extender	PAC Nurse	4	5	4	X	X	X	X	X	X	X	X
012	Extender	PAC/ED Nurse Alpine	5	5	2	X	X	X	X	X	X	X	X

Appendix 3: NON-DISCLOSURE AGREEMENT AND INFORMED CONSENT FORM

Not Applicable

Appendix 4: MODERATOR'S GUIDE

Credentials for eRx: Login: lcalrissian; Password: Be2light88*; pconn.afoundria.com

List of Tested CEHRT Criteria

§ 170.315 (a)(5) Demographics

§ 170.315 (a)(6) Problem List

§ 170.315 (a)(8) Medication Allergy List

§ 170.315 (a)(9) Clinical Decision Support

§ 170.315 (a)(14) Implantable Device List

§ 170.315 (b)(2) Clinical Information Reconciliation and Incorporation

§ 170.315 (a)(7) Medication List

§ 170.315 (a)(1) Computerized Provider Order Entry (CPOE) – medications

§ 170.315 (a)(4) Drug-drug, Drug-allergy Interaction Checks for CPOE & § 170.315 (b)(3) Electronic Prescribing

Key to the Moderater's Guide

[Instruction]

[Question?]

Prior to Testing

What is your job title / appointment?

How long have you been working in this role?

What are some of your main responsibilities?

Tell me about your experience with electronic health records.

Introduction, Overview and Orientation

Thank you for participating in this review and testing of some of a soon-to-be-released version of ChartPath. The features you will be testing are components that require Usability Testing in order to be certified as CEHRT by the Office of the National Coordinator, or ONC.

We expect the session today will last between 60 and 90 minutes, depending on your familiarity and previous experience or training on ChartPath. If you are not experienced with ChartPath and when the functionality is new to ChartPath we will provide you with a video overview of the feature or function.

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.

I will ask you to complete a few tasks using this system. 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. Following each section, you will be asked a series of questions and your responses will be recorded. 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 are not expected to do anything more than asked. If you get lost or have difficulty I cannot answer 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.

Do you have any questions before we start?

Conditional: Test Subjects that are not familiar with post-acute and long term care will need the following contextual information:

Key information for test subjects that are not familiar with ChartPath and perhaps not familiar with post-acute and long term care:

- ChartPath is an electronic health record system for physicians and physician extenders (nurse practitioners and physician assistants) that work in the post-acute and long term care (PALTC) setting. This includes patients that reside in skilled nursing facilities, nursing homes, inpatient rehabilitation facilities, long-term acute care hospitals, assisted living facilities, continuous care retirement communities, and patients in hospice care.
- Post-acute and long term care (PALTC) practices range from solo practitioners to organizations with scores or even hundreds of providers. Large provider organizations may cover scores of geographically and clinically diverse facilities. The larger an organization becomes the more they are likely to be organized into “teams” of providers with responsibility for groups of patients and collections of facilities.
- A longitudinal patient record is created that is meant to follow patients as they transition from one setting to another. Ultimately the patients care is meant to be handed off to a primary care provider and an electronic health record is provided to the primary care provider, assuming there is one.
- ChartPath is used by providers that have little or no “front office” and “back-office” support; thus the clinical providers are responsible for more information capture than is typical in an inpatient or office setting.
- ChartPath is a browser-based application; i.e. all user interactions are done in a web-browser. Information is stored automatically as it is entered so long as there is an internet connection.
- Users of ChartPath access the system by a login/password combination and their access to the different features and functions is dependent on their role; i.e. physician, nurse practitioner, scribe, administrator, etc. For purposes of this testing all users will have access as if they are a physician provider.

Open Browser, Navigate to Website, Logon to System

Prompt	Instruction	Data: Patient A	Data: Patient B	Data: Patient C
Orientation				
We will now start ChartPath.				
Start Chrome				
Open the chrome browser				
Start the application and login to icehrt				
Type https://icehrt.afoundria.com in the address window.				
Login using the login: And the password:				
Summary				
Orientation:				
What you see on the screen and what you think it means?.				
Spend a few minutes clicking around the interface but don't click the "Add a Patient" button yet. Describe what you see and experience.				
Anticipation:				
What do you think is the next step in charting on a patient.				
Experience:				
What do you find helpful and intuitive about the user experience?				
What do you find confusing or difficult about the user experience?				
Conditional: If the test subject is not familiar with ChartPath, play the Logon and Patient Census Orientation video, then ask if they have any questions before proceeding				
Orientation:				
What questions do you have about what you have seen?				
Anticipation:				
What do you think is the next step in charting on a patient.				
Experience:				
What do you find helpful and intuitive about the user experience?				
What do you find confusing or difficult about the user experience?				
Conditional: If the Test Subject is not familiar with ChartPath, share with them the following contextual information:				
Discuss the concept of Visits, Stays, Notes, Charts. the Longitudinal Patient Health Record, and Patient Census.				
Important points: • Patient's typically will reside in a post-acute setting for several days up to several months or even years. The time from admit to discharge or other transition in the post-acute space is referred to as a **Stay**. • During their Stay in a post-acute setting patients will be visited by clinician providers every few days, or in long term care at least once a month. Each of these **Visits** is chronicled in a **Note**. • There are different types of Visits and thus different Note types. Examples include Pre-admit, Admission History and Physical, Consult Note, Progress Note, Discharge Note, Home Health Certification Note, etc. • Visits that will be charged to the patient or insurer must be documented to a detailed set of specifications. When documented to those specifications these Notes can be referred to as a **Chart**. Serial visits and the notes that are recorded chronicling those Visits constitute the Longitudinal Patient Health Record. The capture, storage, retrieval and iterative updating of this Longitudinal Patient Health Record is the core function of the ChartPath EHR. • The group of patients that are, at any given point in time, being cared for by a Provider Group is referred to as the **Patient Census**.				

§ 170.315 (a)(5) Demographics

Register a Patient

Prompt	Action	Data: Patient A	Data: Patient B	Data: Patient C
Orientation				
The first step in the creation of a patient record is registering a patient. This involves the capture of what is termed “demographic information”.				
Click the “Add a Patient” button.				
Step 1: Enter Initial Patient Information				
Enter the following information, then click “Next”.				
First name:		Randall	Margaret	Fred
Middle name:		A.	B.	C
Last Name:		Daggs	Morton	Slaughter
Suffix:		Null/None	Null/None	Null/None
Preferred Name:		Randy	Null/None	Null/None
Maiden Name:		Null/None	Curtis	Null/None
Birth Sex		Male	Female	Male
Birthdate:		01/01/1950	April 4, 1956	7 September, 1948
Advanced Directives:		Full Code	Null/None	Null/None
Step 2: Enter Stay Information				
Enter the following information, then click “Next”.				
Admit Date:		[today]	3 days ago	[today]
Facility		Golden Years Nursing Care	Golden Years Nursing Care	Golden Years Nursing Care
Room		B200	Null/None	Null/None
POS		31 – Skilled Nursing Facility	32 - Nursing Facility	32 - Nursing Facility
Facility MRN		1234567	8765432	Null/None
Supervising		Charles Owen	Charles Owen	Charles Owen
PCP		Smith	Jon Jameson	Null/None
Referring Facility		Rampart General Hospital	Null/None	Null/None
Referral Source		Taglia	Null/None	Null/None
Hospice		No	No	No
Unit:		Sunlight	Null/None	Null/None
Step 3: Enter Additional Patient Information				
Enter the following information, then click “Next”.				
Emergency Contact				
First Name		Rhonda	Null/None	Null/None
Last Name		Remmy	Null/None	Null/None
Relationship		Spouse	Null/None	Null/None
Phone		(555) 555-1212	Null/None	Null/None

Prompt	Action	Data: Patient A	Data: Patient B	Data: Patient C
Referral Source				
Name		Primary Care Practitioner	Unknown	Null/None
Contact Information				
Address 1		1010 N. Main	Null/None	Null/None
Address 2				
City		Austin	Null/None	Null/None
State		TX	Null/None	Null/None
ZIP		78787	Null/None	Null/None
Home Phone		(555) 555-1211	Null/None	Null/None
Mobile Phone		(555) 555-1213	Null/None	Null/None
Email		Remmy@Remmy.me	Null/None	Null/None
Additional Demographic Information				
Preferred Language		English	Spanish, Castillian	Thai
Race		Black of African American & French	Alaska Indian	White
Ethnicity		Not Hispanic or Latino	Cuban	Dominican
Sexual Orientation		Straight or heterosexual	Choose not to disclose	Lesbian, gay, or homosexual
Sexual Orientation (other)		Null/None	Null/None	Null/None
Gender Identify		Male	Female	Male
Gender Identity (other)		Null/None	Null/None	Null/None
Click “Create Patient”				
Summary				
Orientation:				
What you see on the screen and what you think it means?.				
Spend a few minutes clicking around the interface but don’t click the “Add a Patient” button yet. Describe what you see and experience.				
Anticipation:				
What do you think is the next step in charting on a patient.				
Experience:				
What do you find helpful and intuitive about the Register a Patient (Demographics) user experience?				
What do you find confusing or difficult about the Register a Patient (Demographics) user experience?				
Rate the usability of this feature as Very Easy, Easy, Routine, Difficult, or Very Difficult.				
Conditional: If a Duplicate Patient alert is generated?				
Something				
sdfsdf				
Optional				
Something				
sfsdaf				

Prompt	Action	Data: Patient A	Data: Patient B	Data: Patient C

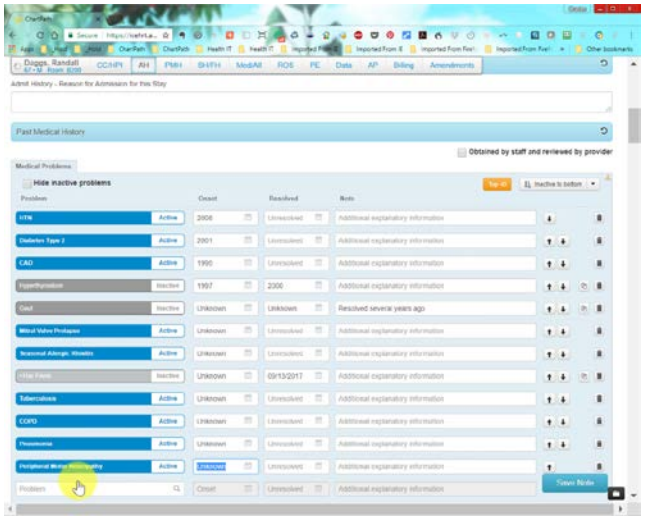
Create a Note

Prompt	Action	Data: Patient A	Data: Patient B	Data: Patient C
Orientation: Create a Note				
Select Note Type				
Select the Note Type specified in the instructions and click “Create New Note”				
Note Type:		CEHRT		
Summary				
Orientation:				
What you see on the screen and what you think it means?.				
Spend a few minutes clicking around the interface but don’t click the “Add a Patient” button yet. Describe what you see and experience.				
Anticipation:				
What do you think is the next step in charting on a patient.				
Experience:				
What do you find helpful and intuitive about the Create a Note user experience?				
What do you find confusing or difficult about the Create a Note user experience?				
How would you change the process of Create a Note?				
Conditional: Users who are not familiar with ChartPath				
Play the ChartPath Charting Orientation video				
The Usability Testing that you are participating in will cover only a few specific charting activities. You have already experienced the Patient Registration. The other specific functions that we are testing today include: • the creation of a Problem List; • documenting medication allergies; • interaction with Clinical Decision Support; • capture of information about Implantable Devices; • reconciliation of information from other sources regarding Medications, Medication Allergies, and Problem Lists; • creation of a historical Medication List; • ordering Medications; • checking drug/drug interactions and drug allergies, and • electronic prescribing.				
Optional				
Something				
sfsdaf				

§ 170.315 (a)(6) Problem List

Orientation: Generate a Problem List				
• CEHRT recording of the patient Problem list is meant to generate a list of problems codified to SNOMed CT. • Medical Problems are documented under the Past Medical History (PMH) tab. • ChartPath accepts documentation of Problems (codified or free-text), their status as Active or Resolved, Onset and Resolution dates, and free text notes. • Common Problems can be selected from the “Top 40” popup. Any Problem can be entered from the individual “Problem” row. • An existing list of Problems in electronic form can be pasted into a “Free Text List of Medical Problems section.				
Prompt	**Action**	**Data: Patient A**	**Data: Patient B**	**Data: Patient C**
Navigate to the PMH section and enter the following information in the Medical Problems section.				
Step 1: Enter the following list of Problems, with date of onset and resolution as appropriate. (Problem | Onset date | Resolved date_)				
Problem 1 | Onset | Resolution | Note		Hypertension | 2008 | null | Null		
Problem 2 | Onset | Resolution | Note		Diabetes Type 2 | 2001 | null | Null		
Problem 3 | Onset | Resolution | Note		CAD | 1995 | null | null		
Problem 4 | Onset | Resolution | Note		Hyperthyroidism | 1997 | 2000 | Null		
Problem 5 | Onset | Resolution | Note		Gout | | | Resolved several years ago		
Problem 6 | Onset | Resolution | Note		Mitral valve prolapse		
Problem 7 | Onset | Resolution | Note				
Problem 8 | Onset | Resolution | Note				
Step 2: Enter the following list of Problems using the Convert to List function. then codify them when possible.				
Enter a list of Free-Text medical Problems		seasonal allergies hayfever tuberculosis COPD pneumonia peripheral neuropathy		
Step 3: Codify the list when possible.				
Summary				
Orientation:				
What you see on the screen and what you think it means?.				
Anticipation:				
What do you think is the next step in charting on a patient.				
Experience:				
What do you find helpful and intuitive about this experience?				
What do you find confusing or difficult about it?				
How would you change ths process to make it easier, faster, or more intuitive?				
Rate the usability of this feature as Very Easy, Easy, Routine, Difficult, or Very Difficult.				
Conditional: BasedOn				
Instruction				
Rearrange Medical Problems				
Move problem # X to Y				
Optional				

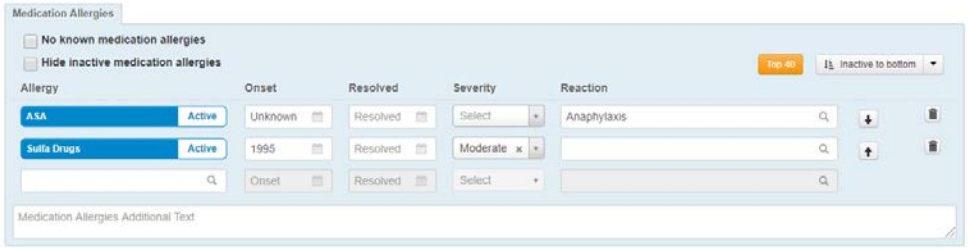
Move problem # Z to A				



§ 170.315 (a)(8) Medication Allergy List

Orientation: Create a Medication Allergy List				
ChartPath documents Medication Allergies based on information collected from the patient and from data that is incorporated by accepting an electronic record from outside sources. Details of the specific allergy may also be recorded when available; Onset: [Date] When the allergy was first noted; Resolved: [Date] The date that an allergy was noted to have been resolved, or no longer occures (if true, and when known.); Severity: A coded description of the severity of the allergy as judged by the clinician; and Reaction: A coded description of the nature of the reaction. It is important to note that the Allergy can be marked as “Inactive” by toggling the entry itself, or by adding a Resolved date..				
Prompt	**Action**	**Data: Patient A**	**Data: Patient B**	**Data: Patient C**
Step 1: Enter the following Medication Allergies, with Onset, Resolved, Severity and Reaction as noted.				
		Allergy: Penicillins Onset: Resolved: Severity: Reaction:		
		Allergy: Sulfa **Onset**: 1995 Resolved: **Severity**: Moderate Reaction:		
		Allergy: Aspirin Onset: Resolved: Severity: **Reaction**: Anaphylaxis		
Step 2: Modify the Allergy section as follows:				
		Allergy: Penicillins Onset: **Resolved**: 2010 Severity: Reaction:		
		Allergy: Sulfa Onset: 1995 Resolved: **Severity**: Severe Reaction:		
		Allergy: Aspirin Onset: Resolved: Severity: **Reaction**: Anaphylaxis		
		Move the Aspirin allergy to the top of the list.		
		Delete the Penicillin allergy		
Step 3:				
Problem 1		Penicillins		
Step 4:				
Problem 1		Penicillins		

Step 5:				
Problem 1		Penicillins		
Enter Medical Problems (Problem | Onset date | Resolved date_)				
Summary				
Orientation:				
What you see on the screen and what you think it means?.				
Anticipation:				
What do you think is the next step in charting on a patient.				
Experience:				
What do you find helpful and intuitive about this experience?				
What do you find confusing or difficult about it?				
How would you change ths process to make it easier, faster, or more intuitive?				
Rate the usability of this feature as Very Easy, Easy, Routine, Difficult, or Very Difficult.				
Conditional: BasedOn				
Instruction				
Rearrange Medical Problems				
Move problem # X to Y				
Optional				
Move problem # Z to A				



§ 170.315 (a)(7) Medication List

Orientation: Generate a list of Medications that the patient has been taking.				
The next usability test section deals with patients' medication lists. The quality of the data that is available at the time a patient's medications are recorded is highly variable. Lists may be incomplete. Details of dosing and frequency are frequently vague or not available. This Medication List testing will attempt to mock up this condition by having you make three passes through the Medicaiton list. The first will ask you to identify only the medication. Next you will be asked to add details of dose, route, and frequency.				
Prompt	**Action**	**Data: Patient A**	**Data: Patient B**	**Data: Patient C**
Step 1: Enter as many of the following medications as you can in 5 minutes. Record ONLY the medication and not the dose, form, frequency, or route.				
		Acetaminophen 650mg Q4 PRN PO		
		Maalox		
		Amiodarone HCL 200mg BID PO		
		Ascorbic Acid 500mg Daily PO		
		Aspirin 325mg Daily PO		
		Atorvastatin Calcium 40mg Bedtime PO		
		Bisacodyl 10mg Daily PRN Rectal		
		Carvedilol 12.5mg BID PO		
		Cyclobenzaprine HCL 10mg Bedtime PRN PO		
		Diphenhydramine HCL 50mg Q6 PRN		
Cut off here				
		Fluticasone Propionate 1Spray BID Nasal		
		Ferrous Sulfate		
		Furosemide 40mg Daily PO		
		Pantoprazole Sodium 40mg AC BK PO		
		Potassium Chloride 20meq Daily PO		
		Pseudoephedrine HCL 30mg BID PRN PO		
		Sertraline HCL 100mg Bedtime PO		
		Polyethylene Glycol 17Gm Daily PRN PO		
		sacubitril 24 MG / valsartan 26 MG [Entresto] 1Each BID PO		
		Lactobacillus Acidoph/Bulgaricus 2tab Daily PO		
		Isosorbide Mononitrate 60mg Daily PO		
		Iron/Liver/Vitamin B Complex 150mg Daily PO		
		Docusate Calcium 240mg Daily@0900		
Step 2: Cycle back through the Medication List and add the details as specified.				
Step 3: Enter Stop Dates for the following medications				
		Amiodarone HCL 200mg BID PO Date: Unknown		
		Ascorbic Acid 500mg Daily PO Date: Today		

		Atorvastatin Calcium 40mg Bedtime PO Date: Unknown		
		Carvedilol 12.5mg BID PO Date: Unknown		
		sacubitril 24 MG / valsartan 26 MG [Entresto] 1Each BID PO Date: Unknown		
Step 4: Sort the Medications List to place the "Inactive" medications at the bottom of the list.				
Step 5: Delete the following Medication entries.				
		Furosemide 40mg Daily PO		
		Pantoprazole Sodium 40mg AC BK PO		
Step 6: Copy the list of Medications into the "Convert to List" text box and click on "Convert to List".				
Go to the top of the Medications section and click on the "Free Text Meds" tab.				
		Atorvastatin Gabapentin Lisinopril Flecainide		
Step 7: Create "Codified" entries for all of these Medications.				
Step 8: Move all of these Medications into "Current Meds".				
Summary				
Orientation:				
What you see on the screen and what you think it means?.				
Experience:				
What do you find helpful and intuitive about this experience?				
What do you find confusing or difficult about it?				
How would you change this process to make it easier, faster, or more intuitive?				
Anticipation:				
What do you think is the next step in charting on a patient.				
Rate the usability of this feature as Very Easy, Easy, Routine, Difficult, or Very Difficult.				
Conditional: BasedOn				
Instruction				
Rearrange Medical Problems				
Move problem # X to Y				
Optional				
Move problem # Z to A				

§ 170.315 (a)(2) CPOE Labs

Orientation: Computerized Provider Order Entry Labs				
This usability testing section will focus on Computerized Provider Order Entry of labs.				
Prompt	**Action**	**Data: Patient A**	**Data: Patient B**	**Data: Patient C**
Navigate to the Labs section.				
Step 1: Enter the following orders for Lab tests.				
		Complete blood count (hemogram)		
		Urinalysis complete panel – Urine		
		Folate [Mass/volume] in blood		
		Comprehensive metabolilc 2000 panel		
		Iron binding capacity unsaturated		
Summary				
Orientation:				
What you see on the screen and what you think it means?.				
Anticipation:				
What do you think is the next step in charting on a patient.				
Experience:				
What do you find helpful and intuitive about this experience?				
What do you find confusing or difficult about it?				
How would you change ths process to make it easier, faster, or more intuitive?				
Rate the usability of this feature as Very Easy, Easy, Routine, Difficult, or Very Difficult.				
Conditional: BasedOn				
Instruction				
Rearrange Medical Problems				
Move problem # X to Y				
Optional				
Move problem # Z to A				

§ 170.315 (a)(9) Clinical Decision Support

Orientation: Display Clinical Decision Support information to Providers and Patients.

There are two classes of Clinical Decision Support that are to be tested in this session:

- recommended actions to be taken based on a specific patient's recorded demographic data (age, gender, race), medications, medication allergies, active problems, lab tests and vital signs.
- information available for display to both the cliniician provider and the patient based on recorded Medications and Problems / Medical Conditions,

In this test session we will navigate to two areas of a chart that demonstrates each of the above capabilities and you will be asked a series of questions about the information that is displayed.

We will explore first the "Interventions" aspect of Clinical Decision Support.

1. Open the patient chart specified by your testing proctor. XXXXX
2. Spend two minutes exploring the Clinical Decision Support Interventions section including embedded "links", describing what you see and then answering several questions.

Prompt	Action	Data: Patient A	Data: Patient B	Data: Patient C
Step 1: Describe what you feel is the intended purpose of this section; i.e. what is the intended outcome?				
Success Metrics				
Step 2: For each of the interventions listed, select which classes of patient data "triggered" the Clinical Decision Support Intervention				
Success Metrics				
Step 3: Describe what occurs when you click on the [source] link.				
Success Metrics				

We will explore next the "Information " aspect of Clinical Decision Support.

1. Open the patient chart specified by your testing proctor. XXXXX
2. Navigate to the Past Medical History: Medical Problems | Medications | Medical Allergies section of the chart.

Prompt	Action	Data: Patient A	Data: Patient B	Data: Patient C
Step 4: Describe the entries; specifically note any new or unfamiliar interface elements.				
Succes Metrics				
Step 5: Click on one of the "I" links in a specific Medical Problem, Medication, or Allergy. Describe what you see.				
Succes Metrics				
Step 6: Describe what occurs when you click on the [i] link.				
Succes Metrics				
Summary				
Orientation:				
What you see on the screen and what you think it means?.				
Anticipation:				

What do you think is the next step in charting on a patient.				
Experience:				
What do you find helpful and intuitive about this experience?				
What do you find confusing or difficult about it?				
How would you change ths process to make it easier, faster, or more intuitive?				
Rate the usability of this feature as Very Easy, Easy, Routine, Difficult, or Very Difficult.				
Conditional: BasedOn				
Instruction				
Rearrange Medical Problems				
Move problem # X to Y				
Optional				
Move problem # Z to A				

§ 170.315 (a)(14) Implantable Device List

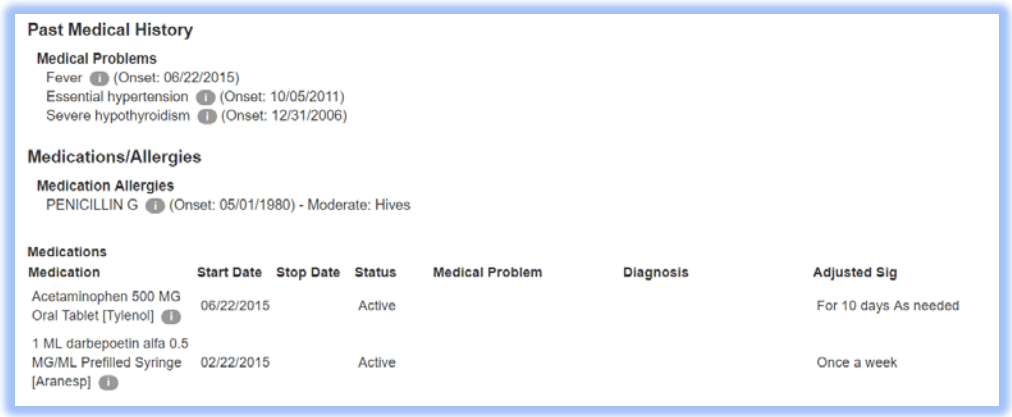
Orientation: Allow the documentation of Implantable Devices.				
Implantable Devices are medical hardware and/or electronics that are implanted in a patient. It is important to know what patients have what devices implanted both for monitoring the outcomes for quality monitoring and research purposes AND to be able to contact patients in circumstances where a specific device or class of devices needs servicing or recall. This test section will review the recording and review of information on such devices. I				
Prompt	**Action**	**Data: Patient A**	**Data: Patient B**	**Data: Patient C**
Step 1: Navigate to the ID (Implantable Device) tab.				
Step 2: Copy and paste one of the ID tags into the "Unique ID" field and tab through.				
		+B066102357NS1		
Step 3: Identify and fill additional required data.				
Step 4: Interpret the information that is displayed.				
Summary				
Orientation:				
What you see on the screen and what you think it means?.				
Anticipation:				
What do you think is the next step in charting on a patient.				
Experience:				
What do you find helpful and intuitive about this experience?				
What do you find confusing or difficult about it?				
How would you change ths process to make it easier, faster, or more intuitive?				
Rate the usability of this feature as Very Easy, Easy, Routine, Difficult, or Very Difficult.				
Conditional: BasedOn				
Instruction				
Rearrange Medical Problems				
Move problem # X to Y				
Optional				
Move problem # Z to A				

§ 170.315 (b)(2) Clinical Information Reconciliation and Incorporation

There are three patients in the Test System that have been created with the specific intent of testing Clinical Information Reconciliation and Incorporation. These three patients are:

Orientation: Reconcile alternative sources of electronic data regarding Medications, Medication Allergies, and the patient's Problem List.				
Clinical Information Reconciliation refers to the process of pulling in information from a previously captured EHR and then reconciling this imported data with information in the current active record.				
Prompt	**Action**	**Data: Patient**	**Data: Patient B**	**Data: Patient C**
Step 0: Orientation / Training: Play the following Clinical Information Reconciliation and Incorporation video: VideoLink				
Video				
Describe why you think this functionality is part of MIPS and how you believe it will be used.				
What questions do you have before we proceed?				
Step 1: Open the following patient Chart:				
		Cecilia Cummings	Susan Turner	Myra Jones
Step 2: Create a new "Progress Note" (Copy from existing, accepting all default "pull-forward" selections.				
Step 3: Select a CCD (a previously recorded patient chart) dated August 15, 2017 and click button to "Import CCD".				
Spend 30 seconds describing what you see and what you think it means:				
Step 4: Make the following edits to the Medical Problems tab:				
		Accept : Fever (Start Date: 06/22/2015 / Resolved Date: 9/1/2017 **Remove**: Overweight **Accept**: Essential Hypertension **Accept**: Severe Hypothyroidism **Remove**: Chronic rejection of renal transplant		
Accept the Medical Problems changes:				
Step 5: Make the following edits to the Medication Allergies tab.				
		Remove: Ampicillin		
Accept the Medication Allergy reconciliation edits.				
Step 6: Make the following edits to the Medications tab.				
		Remove Ceftriaxone **Accept** Acetaminophen 500 Oral Tablet Start Date: 06/22/2015 Adjusted Sig: For 10 days As needed.		
Accept the Medications reconciliation edits.				
Summary				
Orientation:				
What you see on the screen and what you think it means?.				

Experience:				
What do you find helpful and intuitive about this experience?				
What do you find confusing or difficult about it?				
How would you change this process to make it easier, faster, or more intuitive?				
Anticipation:				
What do you think is the next step in charting on a patient.				
Rate the usability of this feature as Very Easy, Easy, Routine, Difficult, or Very Difficult.				
Conditional: BasedOn				
Instruction				
Rearrange Medical Problems				
Move problem # X to Y				
Optional				
Move problem # Z to A				



2: Patient Summary Screen (XXX Seconds)
the participant to the starting point for the task.

Before going into the exam room and you want to review Patient's chief complaint, history, and vitals. Find this information.

Success:

Easily completed

Completed with difficulty or help :: Describe below □ Not completed Comments:

Task Time: _____Seconds

Optimal Path: Screen A □□Screen B □□Drop Down B1 □□"OK" Button □□Screen X…

Correct

Minor Deviations / Cycles :: Describe below

Major Deviations :: Describe below Comments:

Observed Errors and Verbalizations:

Comments:

Rating:

Overall, this task was:

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

Administrator / Notetaker Comments:

3: Find Lab Results (XXX Seconds)

the participant to the starting point for the task.

On her last visit, you sent Patient to get a colonscopy. Locate these results and review the notes from the specialist.

Success:

Easily completed

Completed with difficulty or help :: Describe below □ Not completed Comments:

Task Time: _____Seconds

Optimal Path: Screen A □□Screen B □□Drop Down B1 □□"OK" Button □□Screen X…

Correct

Minor Deviations / Cycles :: Describe below

Major Deviations :: Describe below Comments:

Observed Errors and Verbalizations:

Comments:

Rating:

Overall, this task was:

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

Administrator / Notetaker Comments:

4: Prescribe medication (XXX Seconds)

the participant to the starting point for the task. Ensure that this patient has a drug-drug and a drug-food allergy to the drug chosen. This will put force the participant to find other drugs and use other elements of the application.

After examining Patient, you have decided to put this patient on a statin – drug name. Check for any interactions and place an order for this medication.

Success:

Easily completed

Completed with difficulty or help :: Describe below □ Not completed Comments:

Task Time: _____Seconds

Optimal Path: Screen A □□Screen B □□Drop Down B1 □□"OK" Button □□Screen X…

Correct

Minor Deviations / Cycles :: Describe below

Major Deviations :: Describe below Comments:

Observed Errors and Verbalizations:

Comments:

Rating:

Overall, this task was:

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

Administrator / Notetaker Comments:

Final Questions (X Minutes)

What was your overall impression of this system?

What aspects of the system did you like most?

What aspects of the system did you like least?

Were there any features that you were surprised to see?

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

Compare this system to other systems you have used.

Would you recommend this system to your colleagues?

Administer the

Appendix 5: SYSTEM USABILITY SCALE QUESTIONNAIRE

*In 1996, Brooke published a "*low-cost usability scale that can be used for global assessments of systems usability*" known as the System Usability Scale or SUS.*[16] *Lewis and Sauro (2009) and others have elaborated on the SUS over the years. Computation of the SUS score can be found in Brooke's paper, in at* http://www.usabilitynet.org/trump/documents/Suschapt.doc *or in Tullis and Albert (2008).*

Rate the following statements from Strongly Agree (1) to Strongly Disagree (5).

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

2.I found the system unnecessarily complex.

3.I thought the system was easy to use.

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

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

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

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

8.I found the system very cumbersome to use.

9.I felt very confident using the system.

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

---

[16] Brooke, J.: SUS: A "quick and dirty" usability scale. In: Jordan, P. W., Thomas, B., Weerdmeester, B. A., McClelland (eds.) *Usability Evaluation in Industry* pp. 189--194. Taylor & Francis, London, UK (1996). SUS is copyrighted to Digital Equipment Corporation, 1986.

Lewis, J R & Sauro, J. (2009) "The Factor Structure Of The System Usability Scale." in *Proceedings of the Human Computer Interaction International Conference (HCII 2009), San Diego CA, USA*

Appendix 6: INCENTIVE RECEIPT AND ACKNOWLEDGMENT FORM

Not Applicable

Attestation Statement

Quality Management System (§170.315(g)(4)

August 10, 2017

Charles Owen, MD
5114 Balcones Woods Drive
Ste 307-348
Austin, TX 78759

Afoundria attests that in accord with ONC criteria §170.315(g)(4), the following Quality Management System was used in the development, testing, implementation, and maintenance for the criteria in which certification is being sought as outlined below:

Identify Standard:

Federal or SDO standard QMS ISO/IEC 90003:2014 (Software engineering -- Guidelines for the application of ISO 9001:2008 to computer software) was used in the development, testing, implementation, and maintenance of applicable criteria.

Applicability:

Standard declared above is applicable to all criteria in which certification is being sought.

I hereby attest that all above statements are true, as an authorized signing authority on behalf of my organization.

Charles B."Buddy" Owen, MD
Chief Medical Information Officer and Product Manager of ChartPath

Attestation Statement

Accessibility-Centered Design (170.315.g.5)

August 10, 2017

Charles Owen, MD
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Austin, TX 78759

Afoundria uses the following standard accessibility-centered design approach in the development, testing, implementation and maintenance of capabilities of each module requiring the use of Accessibility-Centered Design, including but not limited to: b.1, b.2, . b3, b.6, c.1, c.2, c.3, e.1, e.2, e.3, and h.1.

ChartPath is browser-based. Each page generated by the application is subjected to a client-side script that checks HTML source code and detects violations of the three conformance levels of the Web Content Accessibility Guidelines (WCAG) 2.0, and the web-related components of the U.S. "Section 508" legislation. The resulting violations are reviewed for frequency and impact, with critical issues resolved before the page is approved for general release.

I hereby attest that all above statements are true, as an authorized signing authority on behalf of my organization.

Charles B."Buddy" Owen, MD
Chief Medical Information Officer and Product Manager of ChartPath

Appendix A: Attestation Template for Approach #1

Privacy and Security Certification Documentation

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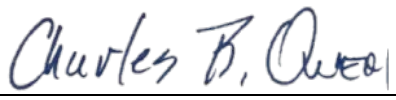
ChartPath Version 1.26

C only needs to be tested once per each applicable privacy and security criteria as the privacy and security capabilities apply to the full scope of capabilities included in the requested testing and certification, except for the following:

- Any health IT system presented for certification to § 170.315(e)(1) must be separately tested to § 170.315(d)(9) [Per the ONC Final Rule].
- Any health IT system presented for certification to § 170.315(e)(2) must be separately tested to § 170.315(d)(9) [Per the ONC Final Rule].
- *[If privacy and security criterion needs to be tested again for other specific criteria, health IT developer should list the applicable privacy and security criteria with reason for testing. NOTE – there is no extra fee or charge for doing this extra testing.]*

I hereby attest that all above statements are true, as an authorized signing authority on behalf of my organization.



Charles B. Owen, M.D.
Chief Medical Information Officer and Product Manager
May 19, 2017

Appendix C: Auditable Events (d.2) Attestation Template

Privacy and Security Certification Documentation

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Afoundria attests to the validity of the information below to satisfy the documentation requirements for testing and certification of the ONC 2015 Edition criteria: *170.315(d)(2).*

1. **Does the health IT module audit logging capability monitor each of the required actions for all instances of electronic health information utilized by the health IT module in accordance with the specified standard ASTM E2147-01?**
   [IN170.315(d)(2)(i)(A)]

   Yes.
   The ChartPath module audit logging capability monitors each of the required actions (listed below) for all instances of electronic health information utilized by the health IT module in accordance with the specified standard ASTM E2147-01.

   - **Additions**
   - **Deletions**
   - **Changes**
   - **Queries**
   - **Print**
   - **Changes to user privileges**
   - **Access to patient information, including emergency access events**

   The Copy function is not supported.

2. **If applicable, and if the health IT module allows it be disabled, is the default state for audit log and audit log status recording enabled by default?**

[IN170.315 (d)(2)(i)(B) and (ii)]

Not applicable.
The health IT module does not permit the audit log or audit log status to be disabled.

3. **If applicable, and if the health IT module allows it to be disabled, is the encryption of electronic health information on end-user devices enabled by default?**
[IN170.315(d)(2)(i)(C) and (ii)]

Not applicable.
The health IT module does not store electronic health information on end-user devices.

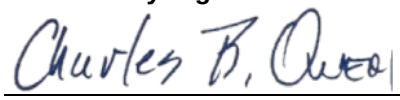
4. **Describe the method(s) through which the audit log protects the following from being changed, overwritten, or deleted by the health IT module.**
[IN170.315(d)(2)(iv)]

Recording of actions related to electronic health information:
There is no editor for changing, overwriting, or deleting data. The data is stored in a relational database that only allows inserts.
Recording of audit log status:
There is no editor for changing, overwriting, or deleting the audit log. Auto-logging is automatically and permanently enabled.
Recording of encryption status:
Each entry in the table is automatically hashed (SHA-2).

5. **Describe the method(s) through which the health IT module is capable of detecting whether the audit log(s) have been altered. Note: This type of alteration would be from outside the health IT module (e.g., hacking, manual tampering, and other software besides the health IT module).**
[IN170.315(d)(2)(v)]

Each entry in the table is hashed (SHA-2). There is a report that scans the audit tables looking for and notifying any modified entries.

I hereby attest that all above statements are true, as an authorized signing authority on behalf of my organization.



Charles B. Owen, M.D.
Chief Medical Information Officer and Product Manager
May 19, 2017

Appendix D: Auditing Actions (d.7) Attestation Template

Privacy and Security Certification Documentation

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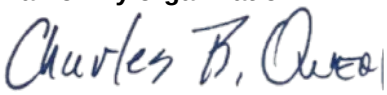
Afoundria attests to the validity of the information below to satisfy the documentation requirements for testing and certification of the ONC 2015 Edition criteria: *170.315(d)(7).*

The health IT module does not store electronic health information on end-user devices. All communication with ChartPath done through https and includes appropriate headers to disable all local and intermediate storage.

I hereby attest that all above statements are true, as an authorized signing authority on behalf of my organization.



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May 19, 2017