170.315(g)(3) Safety Enhanced Design

Product: VertexDr 9.0

Date of Usability Test: July 21st, 2018

Date of Report: 8/8/2018

Report Prepared By: Meridian Medical Management, LLC

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Table of Contents

Executive Summary

A usability study of VertexDr 9.0, an EHR used by multiple specialties and many different size clinics, was conducted on July 21st at our corporate training center in Windsor Connecticut. The study was conducted by Nate Beaudry and Lindsey Welz, two members of the Meridian Medical Management staff.

This study was performed in order to determine where we could make improvements to the application both to ensure client satisfaction as well as to improve the safety of the product.

For this test, eleven healthcare professionals that matched the target demographic of our user base were recruited from clinics surrounding our corporate headquarters in Windsor, CT.

The test covered the following:

1. Creating a new patient with required demographic information
2. Adding and changing a problem to the patient's problem list
3. Adding, changing, and viewing a changed medication to the patient's medication list
4. Adding and changing an allergy to the patient's allergy list
5. Ordering a new medication, modifying that medication
6. Ordering a new lab study, modifying that lab study, and viewii
7. Ordering a new imaging study, modifying that imaging study
8. Triggering drug interaction checks, triggering drug/allergy checks
9. Adding an implantable device, then changing that device
10. Creating clinical decision support guidelines, then triggering those guidelines
11. Incorporating and reconciling clinical information from a transition of care/CCDA
12. Electronically writing a new prescription, cancelling the prescription, then modifying an existing medication

During the 180 minute usability test, each participant was greeted by the Meridian staff and asked to review and sign an informed consent and release form. Two of the eleven participants had prior experience with the EHR. During the testing, the administrator of the test explained each task, provided a basic level of instruction of the module in question (similar to what a new user would receive), then recorded the user's interaction while completing the tasks using a screen recorder. Some of the participants were also set up with webcams to record their facial expressions and verbal interactions. The data was then reviewed and compiled electronically.

The following types of data were collected for each participant:

- Number of tasks successfully completed in the allotted time without assistance
- Time to complete the tasks
- The number of errors that occurred during the tasks
- Path Deviations

3

- Participant's written feedback for each task
- Participant's satisfaction of each task

All participant data was de-identified – no correspondence could be made from the identity of the participant to the data collected. Users were asked to complete an overall usability survey at the end of the test.

Path deviations were most common in the most complex areas of the system, such as clinical decision support, entering medications, and incorporating transitions of care. The only module that had failures occurred was when creating clinical decision support guidelines. These guidelines are very complex and are usually performed by highly trained individuals.

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

Measure	Task	N	Task Success	Steps Taken	Task Time (seconds)		Task Ratings 5=Easy Likert Scale
		#	Mean	(Observed/ Optimal)	Mean (SD)	Optimal	
170.315(a)(1) CPOE - Medications	Add med, change med	11	100	(14/13)	63 (20)	120	4.6
170.315(a)(2) CPOE - Laboratory	Add lab order, change lab order	11	100	(14/12)	88(8)	120	4.3
170.315(a)(3) CPOE - Diagnostic Imaging	Add imaging order, change imaging order	11	100	(13/12)	88 (11)	120	4.3
170.315 (a)(4) Drug-Drug, Drug Allergy interaction checks for CPOE	Check Drug-Drug and Drug Allergy Interactions	11	100	(25/22)	214 (20)	250	3.6
170.315(a)(5) Demographics	Add new patient	11	100	(14/13)	147(19)	180	4.8
170.315(a)(6) Problem List	Add new problem, change problem	11	100	(12/11)	86(12)	120	4.5
170.315(a)(7) Medication List	Add medication, change medication	11	100	(12/11)	108(25)	150	4.6
170.315(a)(8) Medication Allergy List	Add medication allergy, change medication allergy	11	100	(13/12)	89(15)	120	4.7
170.315(a)(9) Clinical Decision Support	Add CDS guidline, trigger CDS guideline	11	72	(77/68)	589(140)	700	4
170.315(a)(14) Implantable Device List	Add implantable device, change implantable device	11	100	(5/5)	57(8)	90	4.5
170.315(b)(2) Clinical Information Reconciliation and Incorporating	Import CCDA, Create New CCDA	11	100	(17/15)	186(27)	240	4
170.315(b)(3) E-Prescribing	Write new script, change script, cancel script, request and receiv med history	11	100	(20/19)	177(26)	180	4.6

The results from the System Usability Scale scored the subjective satisfaction with the system based on performance with these tasks to be 88%. In addition to the performance data, the follow qualitative observations were made.

Major Findings

As a result of this test, we have concluded that although clinical decision support is by itself a very complicated concept – there are some measures we can put in place (such as predefining "mock" CDS interventions that can be modified).

Areas for Improvement

Virtually all of the verbal feedback, written feedback, and errors in the test were related to clinical decision support. This is an area that due to the complexity of different coding systems and clinical queries can be difficult to manage. Our big takeaway from this will be to both provide premade CDS interventions that can easily be copied and modified, as well as consider a more standardized approach when selecting different items in queries, i.e. when a single medical finding has more that one code set – allow a user to select all related codes rather than creating multiple queries.

Introduction

The EHRUT tested for this study was VertexDr 9.0. Designed to present medical information to healthcare providers in an outpatient setting, the EHRUT consists of modules for documentation, computer physician order entry, document management, billing, and scheduling. 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 successful task completion times, deviations from an optimal path, any errors, as well as verbal and written feedback were captured during the usability testing.

Study Design

The study was designed for optimal workflow and the order of the modules tested were arranged in such a way that would replicate the way a user would use the system on a regular basis. The test included the following tasks.

- (a.1) CPOE –Meds

  - Record medication via CPOE

  - Change medication via CPOE

  - Display changed CPOE medication order

- (a.2) CPOE – Labs

  - Record Lab order via CPOE

- o Change Lab order via CPOE

- o Display changed CPOE Lab order

- (a.3) CPOE – Diagnostic Imaging

  - o Record Imaging order via CPOE

  - o Change Imaging order via CPOE

  - o Display changed CPOE Imaging order

- (a.4) Drug-drug, drug-allergy interaction checks for CPOE

  - o Using CPOE, trigger a drug-drug interaction by entering a new medication order

  - o Using CPOE, trigger a drug-allergy interaction by entering a new medication order

  - o Adjust the severity level of a displayed drug-drug interaction

- (a.5) Demographics

  - o Record a patient's preferred language, date of birth, birth sex, race, ethnicity, sexual orientation, gender identity, preliminary cause of death (inpatient only), and preliminary date of death (inpatient only)

  - o Change the patient's preferred language, date of birth, birth sex, race, ethnicity, sexual orientation, gender identity, preliminary cause of death (inpatient only), and preliminary date of death (inpatient only)

  - o Display the patient's changed preferred language, date of birth, birth sex, race, ethnicity, sexual orientation, gender identity, preliminary cause of death (inpatient only), and preliminary date of death (inpatient only)

- (a.6) Problem List

  - o Record a problem to the problem list

- o Change a problem on the problem list

- o Display the active problem list

- o Display the historical problem list

- (a.7) Medication list

  - o Record a medication to the medication list

  - o Change a medication on the medication list

  - o Display the active medication list

  - o Display the historical medication list

- (a.8) Medication allergy list

  - o Record a medication allergy

  - o Change a medication allergy

  - o Display the active medication allergy list

  - o Display the historical medication allergy list

- (a.9) Clinical Decision support

  - o Add a CDS intervention and/or reference resource for each of the required elements

    - ▪ Problem list

    - ▪ Medication list

    - ▪ Medication Allergy List

    - ▪ At least one Demographic

    - ▪ Laboratory Test

- ▪ Vital Signs

- ▪ And a combination of at least 2 of the elements listed above

  o Trigger the CDS interventions/resources added using the applicable data elements from each of the required elements

  o View the intervention/resource information using the Infobutton standard for data elements in the problem list, medication list, and demographics

  o Trigger the CDS interventions/resources based on data elements in the problem list, medication list, and medication allergy list by incorporating patient information from a transition of care/referral summary

  o Access the following attributes for one of the triggered CDS interventions/resources: bibliographic citation, developer, funding source, release/revision date

- (a.14) Implantable Device List

  o Record UDI

  o Change UDI Status

  o Access UDI, device description, identifiers, and attributes

- (b.2) Clinical Information Reconciliation and Incorporation

  o Incorporate a CCDA and conduct reconciliation of the medications, medication allergies, and problems in the CCDA with the information currently in the patient's record

  o Generate a new CCDA with reconciled data

- (b.3) e-Prescribing

  o Create new prescription

  o Change prescription (dosage or duration)

- o Cancel prescription

- o Refill prescription

- o Receive fill status notification

- o Request and receive medication history information

Participants

During the usability test, 11 healthcare professionals matching the target demographic criteria served as participant and used the EHRUT in simulated tasks created by Meridian staff.

Participants were recruited by Meridian staff from surrounding clinics around the Meridian corporate office. Participants were compensation for their time. Participants had no connection to the development of the EHRUT. Participants were given the same level training that actual users would receive.

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

ID	Sex	Age (Years)	Education	Role	Professional Experience (Months)	Computer Experience (Months)	Product Experience (Months)	Assitive Technology
TRAIN 1	Female	30-39 yrs	High School	Claims Adjuster	156	156	0	N/A
TRAIN 2	Female	30-39 yrs	High School	Claims Assistant	120	120	0	N/A
TRAIN 4	Female	20-29 yrs	High School	ER Technician	132	264	0	N/A
TRAIN 5	Female	20-29 yrs	Associates Degree	MRI & X-Ray Tech	48	252	0	N/A
TRAIN 6	Female	50-59 yrs	Associates Degree	Medical Assitant	300	300	0	N/A
TRAIN 7	Female	50-59 yrs	Associates Degree	Medical Assistant	168	168	0	N/A
TRAIN 8	Female	20-29yrs	College	Medical Records Clerk	60	60	0	N/A
TRAIN 9	Female	30-39yrs	Masters Degree	Physical Therapist	168	276	0	N/A
TRAIN 10	Female	50-59yrs	BS Degree	Physical Therapist	396	360	0	N/A
TRAIN 11	Male	30-39yrs	BA Degree	Credentialed EMR Trainer	84	216	24	N/A
TRAIN 12	Female	30-39yrs	High School	Clinical Systems Analyst	216	252	24	N/A

Procedures

Each participant was given a handbook with written copies of the associated tasks. Participants were asked to first listen to a description of the task they were asked to perform, then the administrator would begin the test by saying "start", and then would complete the task. The administrator would then stop the task by audibly saying "stop". User that did not complete the task before the task was stopped, were counted as errors. At the conclusion of each task users were asked to record feedback in their handbook.

Following the conclusion of all tasks, participants were asked to fill out a system usability questionnaire.

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 were members of the Meridian development and training teams with a combined 20 years in development and training expertise

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.

Following the session, the administrator gave the participant the post-test questionnaire, 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.

Test Location and Environment

Testing was conducted at the Meridian corporate training facility in Windsor Connecticut.

Twelve computers were preconfigured to access the testing environment via a citrix remote connection. The testing environment was preconfigured for each user including user accounts into the testing database for the EHRUT. Four of the

computers has attached webcams to record the participant's facial expressions and verbal comments.

Two projection screens were set up in the room so the administrator could provide basic training on each module prior to their respective tasks.

The testing database that was used was comprised of fake patient data, and modules that required incorporating items from an outside source (such as a transition of care, CCDA, or implantable devise) were configured prior to testing.

Usability Metrics

The goals of the study were to assess:

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

Measures	Rational 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 expected amount of time for each task was derived by timing a fully-trained user and multiplying the result by 2 to allow for users who may not be as familiar with the system.
Effectiveness: Task Errors	For each task, if the user failed to complete the task or exceeded the allotted time, that task was recorded as an error.

Effectiveness: Path 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.
Effectiveness: 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.

Data Analysis and Reporting

The results of the usability test were calculated according to the methods specified in the Usability Metrics section above. Below is the report we generated as a result.

14

		#	Mean	(Observed/Optimal)	Mean (SD)	Optimal	
170.315(a)(1) CPOE - Medications	Add med, change med, view changed med	11	100	(14/13)	63 (20)	120	4.6
170.315(a)(2) CPOE - Laboratory	Add lab order, change lab order, view changed order	11	100	(14/12)	88(8)	120	4.3
170.315(a)(3) CPOE - Diagnostic Imaging	Add imaging order, change imaging order, view imaging order	11	100	(13/12)	88 (11)	120	4.3
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170.315(b)(2) Clinical Information Reconciliation and	Import CCDA, Create New CCDA	11	100	(17/15)	186(27)	240	4
170.315(b)(3) E-Prescribing	Write new script, change script, cancel script, request and receiv med history	11	100	(20/19)	177(26)	180	4.6

Effectiveness

With the exception of clinical decision support, all tasks were competed successfully.

15

In the CDS module, some of the users has quite a bit of difficulty adding the criteria necessary for some of the guidelines. This module is fairly complex and uses several different methods in order to identify patients eligible for CDS interventions.

This issue will be addressed a number of ways. First, by providing additional training to our new and existing users. Second, preconfigured clinical decision support measures can be added to the system with data already loaded (allergies, problems, demographics etc) that users will be able to select and then just change the respective criteria they are trying to match.

Efficiency

Most of the modules were completed fairly quickly, again the main exception to this is in regard to clinical decision support. All criticisms collected regarding the efficiency of the system were constructed towards the CDS module.

Considering most users were using this system for the first time, and were given minimal training (most users receive two full days), we are satisfied with the efficiency of the system.

Satisfaction

A system usability survey was done at the end of the test with 10 questions. The following is an average of the questions that were asked:

System Usability Scale					Strongly Disagree ------------------Strongly Agree					
					1	2	3	4	5	Average
1- I think I would like to use this system frequently.										4
2. I found the system unneccesarily complex.										1.54
3. I thought the system was easy to use.										4.36
4. I think that I would need the support of a technical person to be able to use the system.										2.72
5. I found the various functions in this system were well integrated.										3.9
6. I thought there was too much inonsistency in this system.										2.09
7. I would imagine that most people would learn to use the system very quickly.										3.81
8. I found the system very cumbersome to use.										1.72
9. I felt very confident using the system.										3.9
10. I needed to learn a lot of things before I could get going with this system.										1.54

Major Findings

Overall, most users rated the system very favorably. The major complaints that were made were notably mostly about the clinical decision support module. This module will likely need to be revamped in order to make it easier to use without requiring lengthy training.

Areas for Improvement

The clinical decision support module received the most amount of criticisms, as well as the most amount of deviations/failures. This module by nature is very complex as it uses multiple different criteria for creating these guidelines. A pre-requisite knowledge of different code systems, how they are used, and where they occur in the patient's chart is required for effective use of this module. One improvement that can be made here to make guidelines easier to create would be to create measures as examples already set up in the system that users can copy and paste, and just swap out the criteria for each different type of clinical decision support (ie one for labs, one for problem lists, one for medications, etc.)

Also of note, users were critical of the way that drug-drug/drug-allergy interaction levels are changed. Currently this setup is done on an individual user level and requires for a user to access a definition table, access the user, access the prescription settings, and change the level there. One suggestion made was to be able to make this change while in the prescription writer itself, and this is being considered. We do feel that this is mainly an administrator function and is likely not needed for most users.

18

Appendix A: Participant Breakdown

PARTICIPANT DEMOGRAPHICS

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

Gender	
Men	[1]
Women	[10]
Total (participants)	[11]

Occupation/Role	
Medical Assistants	[3]
Admin Staff	[4]
Physical Therapists	[2]
Clinical Trainers	[2]
Total (participants)	[11]

Years of Experience	
Years experience	[147]
Computer Experience	[202]
EMR Experience	[160]

Appendix B: Usability Handbook for participants

Welcome to Meridian SED Testing!

Thank everyone for giving up a Saturday to assist Nate and I. By completing this session you are getting us one step closer to our Certification Process. Once this is complete we will be 1 out of 211 Certified Electronic Medical Record Products in Country.

Today we will walk through various tasks; throughout each task we will be asking you to rate your experience.

After each example you will be asked to provide a scale from along with any additional feedback.
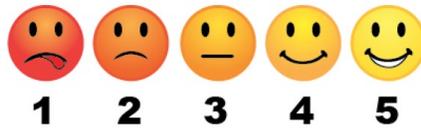
Thank you again for your time we greatly appreciate all your help!!

Let's get Testing!

Lindsey Welz- Lead Software Education Specialist

Nate Beaudry-Technology Support Manager

Angelo Perrotta- VP Application & Design

(a.5) Demographics

*Patient Search- New Patient
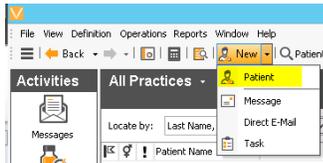
*Enter in Patient Information

Vertex Log In: _____

Patient Example Demographics:

Test, YOUR NAME
1095 Day Hill Road
Windsor, CT 06095
8609256339
DOB: Yours

22

- Record Date of birth, language, ethnicity, race, sexual orientation, gender identity, birth sex – SAVE
- Change Date of birth, language, ethnicity, race, sexual orientation, gender identity, birth sex- SAVE
- Display the patient's changed preferred language, date of birth, birth sex, race, ethnicity, sexual orientation, gender identity

*Navigate away from Demo's and Back to Demographics

1   2   3   4   5

Feedback:_____
_____
_____
_____

(a.6) Problem List

- Record a problem to the problem list

*Click the New Button and Attach to New Encounter

*Add Diabetes: E11.00, Condition Acute by

  o Change a problem on the problem list

*Change the Problem Condition to Chronic

  o Display the active problem list

*Show Active Problem

  o Display the historical problem list

* View – Top Tool Bar, Select Audit- Display Audit Trail

23

Feedback:_____
_____
_____
_____
_____
_____
_____

(a.7) Medication list

- Record a medication to the medication list

*New Dropdown, Select Pre-Existing Medication

*Enter Pre Existing medication: Ambien tablet
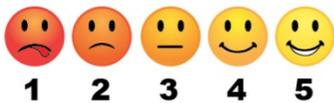
- o Change a medication on the medication list

*Right Click Inactivate & Enter New Pre-Existing Ambien CR

- o Display the active medication list

*Show Active Section

- o Display the historical medication list

* View – Top Tool Bar, Select Audit- Display Audit Trail

Feedback:_____
_____
_____
_____

24

(a.8) Medication allergy list

- Record a medication allergy

*Enter PCN Drug Class Allergy with Mild severity- OK
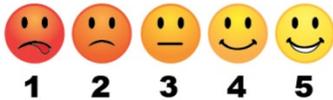
  o Change a medication allergy

*Double Click and Change to Moderate and add Reaction of difficulty breathing

  o Display the active medication allergy list

*Show Active Section

  o Display the historical medication allergy list

* View – Top Tool Bar, Select Audit- Display Audit Trail

😦 😕 😐 🙂 😀
1 2 3 4 5

Feedback:_____
_____
_____
_____
_____
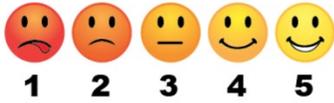_____

(a.1) CPOE –Meds

- Record medication via CPOE

*Order Lisinopril 10mg 1 PO BID for 30days no refills- USE DROP DOWN TO SELECT HAND WRITTEN

  o Change medication via CPOE

*Modify Renew Lisinopril 10mg to 20mg 1 PO BID for 30days no refills

o Display changed CPOE medication order

*Show the Modified Rx by Expanding on Inactive Meds

Feedback:_____
_____
_____
_____
_____
_____

(a.2) CPOE – Labs

- Record Lab order via CPOE:

*Order Quest Lab, Comp Metabolic Panel use DX: E11.00 PRINT & CLOSE

o Change Lab order via CPOE

*Double Click on Order. Select Re-Issue- Double Click on Order & Add Hemoglobin A1C Labs to original Order- PRINT AND CLOSE

o Display changed CPOE Lab order

*Double Click on Order. Select Order in Tool Bar and Display Changed Order

Feedback:_____
_____
_____
_____
_____
_____

26

(a.3) CPOE – Diagnostic Imaging

- Record Imaging order via CPOE

*Order RAH Imaging MRI Head: DX: R51- PRINT & CLOSE

  o Change Imaging order via CPOE

*Double Click on Order. Select Re-Issue

*Double Click Again & Add Ultrasound Aorta to original Order PRINT & CLOSE

  o Display changed CPOE Imaging order

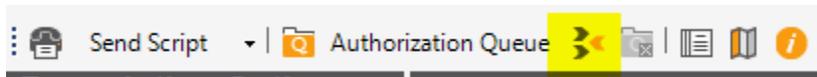*Double Click on Order. Select Order in the Tool Bar and Display Changed Order

Feedback:_____
_____
_____
_____
_____
_____

(a.4) Drug-drug, drug-allergy interaction checks for CPOE

- Using CPOE, trigger a drug-allergy interaction by entering a new medication order

*Order Amoxicillin 500mg TABLET #14 1 PO QD for 7 Days

*Click on the Interactions Icon in the Toolbar (three arrows)

27

- Using CPOE, trigger a drug-drug interaction by entering a new medication order

*Order Favorite Medication Atenolol- Dbl Click Select Send Script

  o Adjust the severity level of a displayed drug-drug interaction

*Adjust Level of Drug Interactions within User Securities.

*Definition, Security, Users. Find your User Name TRAIN#

*Go to Prescriptions; change Drug Interaction Severity from Major to Minor. HIT OK

*Log Out and Log Back in

*Go Back to the patient's acct and RE-Order Favorite Medication of Atenolol

*Click the Interaction Icon in the Tool Bar to display the changes

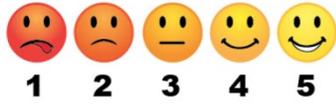**Feedback:**_____
_____
_____

(a.14) Implantable Device List

  o Record UDI
  o Change UDI Status
  o Access UDI, device description, identifiers, and attributes

*Record a new implantable device by copying the following UDI: HIT NEW BUTTON

(01)10884521062856(11)141231(17)150707(10)A213B1(21)1234

28

1 2 3 4 5

Feedback:_____
_____
_____
_____
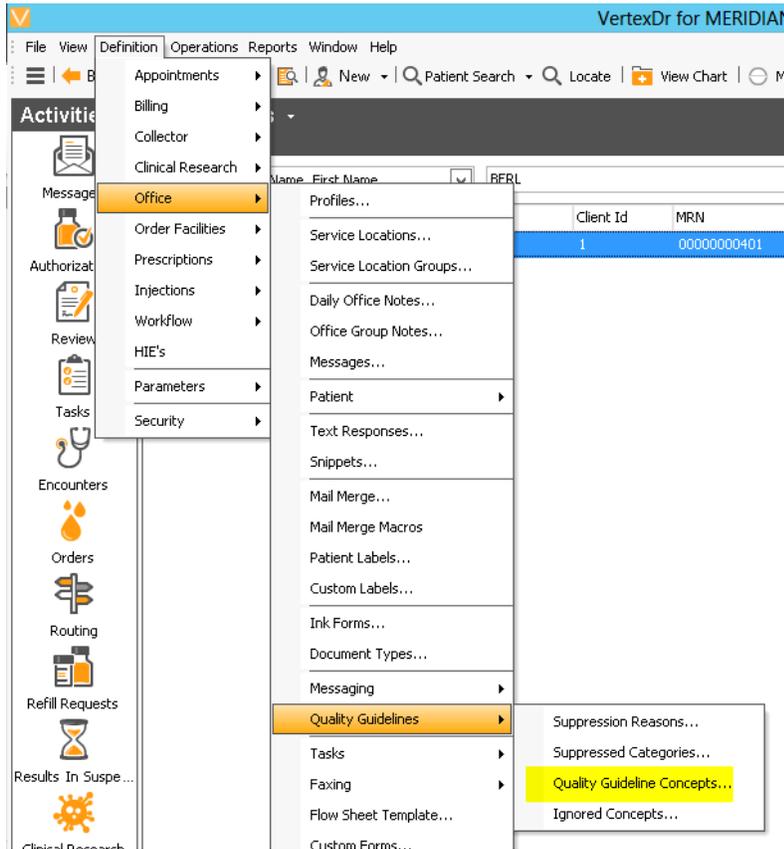_____
_____

(a.9) Clinical Decision support

- o Add a CDS intervention and/or reference resource for each of the required elements

*Definition>Office>Quality Guidelines> Quality Guideline Concepts

*Chose Category-Prevention and Screening

*INSERT

30

VertexDr Quality Guideline Concept Definition

Quality Guideline Concept Definition

Use this form to define custom Quality Guideline Concepts to be used in the patient chart.

Concept Info

Category:	Prevention and Screening ⌄	Status: ☑ Active
Description:		
Eligibility:		
Compliance:		
Citation:		
Funding Source:		
Diagnostic:		
Therapeutic:		
Severity:	Low ⌄	

Auto Populate Criteria

Auto Populate: ☑ Active

Required Sex:	None ⌄	Frequency:	⌄
Minimum Age:	⌄	Maximum Age:	⌄

Eligibility Criteria

Type	Code	Min Value /	Max Value	Description

[Add Query] [Add ICD] [Add Finding] [Add LOINC] [Add Med] [Set Range] [Remove]

☐ ICD-9

Compliance Criteria

Type	Code	Description

[Add Query] [Add CPT] [Add Finding] [Add LOINC] [Remove]

Info Button

Code Type: ICD9 ⌄   Code:

[OK] [Cancel]

- Problem list

*Enter Description, Eligibility & Compliance

*Make ACTIVE

*Add Criteria for type 2 diabetes (ICD10 E11.00)

*Info Button Code Type: ICD10- E11.00

- Medication list

*Eligibility Criteria Add MEDICATION Lisinopril

*INFO BUTTON at the Bottom Info Button Code Type (RxNorm 314077)

- Medication Allergy List

* Eligibility Criteria Add FINDING !4927 – for PCN Allergy

*INFO BUTTON CRITERIA (SNOMED CODE: 91936005)

- At least one Demographic

*CRITERIA Men above 40 years old

*INFO BUTTON CRITERIA (SNOMED 15886004 Prostate Cancer Screening)
42

- Laboratory Test

*CRITERIA Add LOINC Hemoglobin A1C (LOINC 4548-4)

*Set Range: Minimum 12 Maximum 17

*INFO BUTTON CRITERIA: Hemoglobin A1C (LOINC 4548-4)

- Vital Signs

*CRITERIA: Add the SPB Over 120 Query

*INFO BUTTON CRITERIA (SNOMED 163030003)

- And a combination of at least 2 of the elements listed above

*CRITERIA Diabetes (ICD10 Ell.00) and Hemoglobin A1C (LOINC 4548-4) & Set Range: Minimum 12 Maximum 17

***TRIGGER CONCEPTS**

- o Trigger the CDS interventions/resources added using the applicable data elements from each of the required elements

*Enter your patient's chart

*Access Encounter- Click Charting Document BP 140 and PCN Allergy Save & Exit Encounter

*Next go to Orders and Enter Value of 18 on HGB- SAVE AND CLOSE

*Next go to Quality Guidelines- Restore Guidelines

- o View the intervention/resource information using the Info Button standard for data elements in the problem list, medication list, and demographics

*Click Orange "I" Info Button on each Quality Guideline

Feedback:_____
_____
_____
_____

(b.2) Clinical Information Reconciliation and Incorporation

- o Incorporate a CCDA and conduct reconciliation of the medications, medication allergies, and problems in the CCDA with the information currently in the patient's record
- o Generate a new CCDA with reconciled data

*Enter Messages- Open TRANSITION OF CARE MESSAGE
* VIEW CHART
*Go to Medications: Right Click Reconcile Meds
*Go to Allergies: Right Click Reconcile Allergies
*Go to Problems: Right Click Reconcile Problems

*Create new CCDA from the patient's chart, by going to FILE EXPORT CCD

*Click All Selections and OK/SAVE

1   2   3   4   5

Feedback:_____
_____
_____
_____
_____

- o Trigger the CDS interventions/resources based on data elements in the problem list, medication list, and medication allergy list by incorporating patient information from a transition of care/referral summary
- o Access the following attributes for one of the triggered CDS interventions/resources: bibliographic citation, developer, funding source, release/revision date

*Go to Quality Guidelines & RESTORE GUIDELINES.

34

Feedback:_____
_____
_____
_____
_____
_____
_____

(b.3) e-Prescribing

LOG IN TO MU_EPCS DB as EPCS2

Find Patient: Geller, Ross

- o Create new prescription
- o Change prescription (dosage or duration)
- o Cancel prescription
- o Refill prescription
- o Receive fill status notification
- o Request and receive medication history information

*Write new script for Lisinopril 10mg, 1 PO QD for thirty days, send script electronically

*Access Lisinopril from the patient's drug list, change to 60 days.

*Cancel the Lisinopril.

*NEXT - Modify/Renew ZOLOFT 50mg – send electronically

*View Medication details to see fill status notification

*Access third party drug history to view drug history.

1 2 3 4 5

Feedback:_____
_____
_____
_____
_____
_____

Appendix C: System Usability Scale

System Usability Scale

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

37