ONC HIT Certification Program
Test Results Summary for 2014 Edition EHR Certification

Part 1: Product and Developer Information

1.1 Certified Product Information

Product Name:	ScriptSure EMR
Product Version:	v9.5
Domain:	Ambulatory
Test Type:	Complete EHR

1.2 Developer/Vendor Information

Developer/Vendor Name:	DAW SYSTEMS, INC.
Address:	585 Troy-Schenectady Road, Suite 2 Latham NY 12110
Website:	http://www.dawsystems.com/
Email:	support@dawsystems.com
Phone:	866-755-1500
Developer/Vendor Contact:	Aaron Foreman, CTO

Part 2: ONC-Authorized Certification Body Information

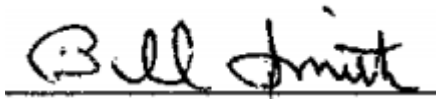
2.1 ONC-Authorized Certification Body Information

ONC-ACB Name:	Drummond Group
Address:	13359 North Hwy 183, Ste B-406-238, Austin, TX 78750
Website:	www.drummondgroup.com
Email:	ehr@drummondgroup.com
Phone:	817-294-7339
ONC-ACB Contact:	Bill Smith

This test results summary is approved for public release by the following ONC-Authorized Certification Body Representative:

Bill Smith
ONC-ACB Authorized Representative

Certification Body Manager
Function/Title


9/13/2015
Signature and Date

2.2 Gap Certification

The following identifies criterion or criteria certified via gap certification

§170.314			
☐ (a)(1)	☐ (a)(19)	☒ (d)(6)	☐ (h)(1)
☒ (a)(6)	☐ (a)(20)	☒ (d)(8)	☐ (h)(2)
☒ (a)(7)	☐ (b)(5)*	☐ (d)(9)	☐ (h)(3)
☐ (a)(17)	☒ (d)(1)	☒ (f)(1)	
☐ (a)(18)	☒ (d)(5)	☐ (f)(7)**	

*Gap certification allowed for Inpatient setting only
**Gap certification allowed for Ambulatory setting only

☐ No gap certification

2.3 Inherited Certification

The following identifies criterion or criteria certified via inherited certification

§170.314			
☐ (a)(1)	☐ (a)(16) *Inpt. only*	☐ (c)(2)	☐ (f)(2)
☐ (a)(2)	☐ (a)(17) *Inpt. only*	☐ (c)(3)	☐ (f)(3)
☐ (a)(3)	☐ (a)(18)	☐ (d)(1)	☐ (f)(4) *Inpt. only*
☐ (a)(4)	☐ (a)(19)	☐ (d)(2)	☐ (f)(5) *Amb. only*
☐ (a)(5)	☐ (a)(20)	☐ (d)(3)	
☐ (a)(6)	☐ (b)(1)	☐ (d)(4)	☐ (f)(6) *Amb. only*
☐ (a)(7)	☐ (b)(2)	☐ (d)(5)	
☐ (a)(8)	☐ (b)(3)	☐ (d)(6)	☐ (f)(7)
☐ (a)(9)	☐ (b)(4)	☐ (d)(7)	☐ (g)(1)
☐ (a)(10)	☐ (b)(5)	☐ (d)(8)	☐ (g)(2)
☐ (a)(11)	☐ (b)(6) *Inpt. only*	☐ (d)(9) *Optional*	☐ (g)(3)
☐ (a)(12)	☐ (b)(7)	☐ (e)(1)	☐ (g)(4)
☐ (a)(13)	☐ (b)(8)	☐ (e)(2) *Amb. only*	☐ (h)(1)
☐ (a)(14)	☐ (b)(9)	☐ (e)(3) *Amb. only*	☐ (h)(2)
☐ (a)(15)	☐ (c)(1)	☐ (f)(1)	☐ (h)(3)

☒ No inherited certification

Part 3: NVLAP-Accredited Testing Laboratory Information

Report Number: SG-09102015-2677

Test Date(s): 9/9/2015, 9/10/2015

3.1 NVLAP-Accredited Testing Laboratory Information

ATL Name:	Drummond Group EHR Test Lab
Accreditation Number:	NVLAP Lab Code 200979-0
Address:	13359 North Hwy 183, Ste B-406-238, Austin, TX 78750
Website:	www.drummondgroup.com
Email:	ehr@drummondgroup.com
Phone:	817-709-1627
ATL Contact:	Kyle Meadors

For more information on scope of accreditation, please reference NVLAP site.

Part 3 of this test results summary is approved for public release by the following Accredited Testing Laboratory Representative:

Sonia Galvan	Test Proctor
ATL Authorized Representative	**Function/Title**
Sonia Galvan 9/13/2015	Houston, TX
Signature and Date	**Location Where Test Conducted**

3.2 Test Information

3.2.1 Additional Software Relied Upon for Certification

Additional Software	Applicable Criteria	Functionality provided by Additional Software
First Data Bank	170.314.a.15	Patient Education Resource provider
ExitCare	170.314.a.15	Patient Education Resource provider
Surescripts Network for Clinical Interoperability	170.314.b.1, 2; 170.314.e.1	HISP
Microsoft HealthVault	170.314.e.1, 3	Patient Portal

☐ No additional software required

3.2.2 Test Tools

Test Tool	Version
[x] Cypress	2.6
[x] ePrescribing Validation Tool	1.0.5
[ ] HL7 CDA Cancer Registry Reporting Validation Tool	1.0.3
[ ] HL7 v2 Electronic Laboratory Reporting (ELR) Validation Tool	1.8.2
[x] HL7 v2 Immunization Information System (IIS) Reporting Validation Tool	1.8.2
[x] HL7 v2 Laboratory Results Interface (LRI) Validation Tool	1.7.2
[x] HL7 v2 Syndromic Surveillance Reporting Validation Tool	1.7.2
[x] Transport Testing Tool	181
[x] Direct Certificate Discovery Tool	3.0.4
[ ] Edge Testing Tool	0.0.5

[ ] No test tools required

3.2.3 Test Data

[ ] Alteration (customization) to the test data was necessary and is described in Appendix [*insert appendix letter*]

[x] No alteration (customization) to the test data was necessary

3.2.4 Standards

3.2.4.1 Multiple Standards Permitted

The following identifies the standard(s) that has been successfully tested where more than one standard is permitted

Criterion #	Standard Successfully Tested	
(a)(8)(ii)(A)(2)	[ ] §170.204(b)(1) HL7 Version 3 Implementation Guide: URL-Based Implementations of the Context-Aware Information Retrieval (Infobutton) Domain	[ ] §170.204(b)(2) HL7 Version 3 Implementation Guide: Context-Aware Knowledge Retrieval (Infobutton) Service-Oriented Architecture Implementation Guide
(a)(13)	[x] §170.207(a)(3) IHTSDO SNOMED CT® International Release July 2012 and US Extension to SNOMED CT® March 2012 Release	[ ] §170.207(j) HL7 Version 3 Standard: Clinical Genomics; Pedigree

Criterion #	Standard Successfully Tested	
(a)(15)(i)	[x] §170.204(b)(1) HL7 Version 3 Implementation Guide: URL-Based Implementations of the Context-Aware Information Retrieval (Infobutton) Domain	[ ] §170.204(b)(2) HL7 Version 3 Implementation Guide: Context-Aware Knowledge Retrieval (Infobutton) Service-Oriented Architecture Implementation Guide
(a)(16)(ii)	[ ] §170.210(g) Network Time Protocol Version 3 (RFC 1305)	[ ] §170. 210(g) Network Time Protocol Version 4 (RFC 5905)
(b)(2)(i)(A)	[ ] §170.207(i) The code set specified at 45 CFR 162.1002(c)(2) (ICD-10-CM) for the indicated conditions	[x] §170.207(a)(3) IHTSDO SNOMED CT® International Release July 2012 and US Extension to SNOMED CT® March 2012 Release
(b)(7)(i)	[ ] §170.207(i) The code set specified at 45 CFR 162.1002(c)(2) (ICD-10-CM) for the indicated conditions	[x] §170.207(a)(3) IHTSDO SNOMED CT® International Release July 2012 and US Extension to SNOMED CT® March 2012 Release
(b)(8)(i)	[ ] §170.207(i) The code set specified at 45 CFR 162.1002(c)(2) (ICD-10-CM) for the indicated conditions	[ ] §170.207(a)(3) IHTSDO SNOMED CT® International Release July 2012 and US Extension to SNOMED CT® March 2012 Release
(e)(1)(i)	Annex A of the FIPS Publication 140-2 [*list encryption and hashing algorithms*] AES SHA-1	
(e)(1)(ii)(A)(2)	[ ] §170.210(g) Network Time Protocol Version 3 (RFC 1305)	[x] §170. 210(g) Network Time Protocol Version 4 (RFC 5905)
(e)(3)(ii)	Annex A of the FIPS Publication 140-2 [*list encryption and hashing algorithms*] AES SHA-1	
Common MU Data Set (15)	[ ] §170.207(a)(3) IHTSDO SNOMED CT® International Release July 2012 and US Extension to SNOMED CT® March 2012 Release	[x] §170.207(b)(2) The code set specified at 45 CFR 162.1002(a)(5) (HCPCS and CPT-4)

Criterion #	Standard Successfully Tested

☐ None of the criteria and corresponding standards listed above are applicable

3.2.4.2 Newer Versions of Standards

The following identifies the newer version of a minimum standard(s) that has been successfully tested

Newer Version	Applicable Criteria

☒ No newer version of a minimum standard was tested

3.2.5 Optional Functionality

Criterion #	Optional Functionality Successfully Tested
☐ (a)(4)(iii)	Plot and display growth charts
☐ (b)(1)(i)(B)	Receive summary care record using the standards specified at §170.202(a) and (b) (Direct and XDM Validation)
☐ (b)(1)(i)(C)	Receive summary care record using the standards specified at §170.202(b) and (c) (SOAP Protocols)
☐ (b)(2)(ii)(B)	Transmit health information to a Third Party using the standards specified at §170.202(a) and (b) (Direct and XDM Validation)
☐ (b)(2)(ii)(C)	Transmit health information to a Third Party using the standards specified at §170.202(b) and (c) (SOAP Protocols)
☐ (e)(1)	View, download and transmit data to a third party utilizing the Edge Protocol IG version 1.1
☐ (f)(3)	Ambulatory setting only – Create syndrome-based public health surveillance information for transmission using the standard specified at §170.205(d)(3) (urgent care visit scenario)
☐ (f)(7)	Ambulatory setting only – transmission to public health agencies – syndromic surveillance - Create Data Elements
☐ Common MU Data Set (15)	Express Procedures according to the standard specified at §170.207(b)(3) (45 CFR162.1002(a)(4): Code on Dental Procedures and Nomenclature)
☐ Common MU Data Set (15)	Express Procedures according to the standard specified at §170.207(b)(4) (45 CFR162.1002(c)(3): ICD-10-PCS)

☒ No optional functionality tested

3.2.6 2014 Edition Certification Criteria* Successfully Tested

Criteria #	Version		Criteria #	Version	
	TP**	TD***		TP	TD
[x] (a)(1)	1.3	1.5	[x] (c)(3)	1.11	1.11
[x] (a)(2)	1.2		[ ] (d)(1)	1.2	
[x] (a)(3)	1.2	1.4	[x] (d)(2)	1.6	
[x] (a)(4)	1.4	1.3	[x] (d)(3)	1.3	
[x] (a)(5)	1.4	1.3	[x] (d)(4)	1.3	
[ ] (a)(6)	1.3	1.4	[ ] (d)(5)	1.2	
[ ] (a)(7)	1.3	1.3	[ ] (d)(6)	1.2	
[x] (a)(8)	1.3		[x] (d)(7)	1.2	
[x] (a)(9)	1.3	1.3	[ ] (d)(8)	1.2	
[x] (a)(10)	1.2	1.4	[ ] (d)(9) *Optional*	1.2	
[x] (a)(11)	1.3		[x] (e)(1)	1.11	1.5
[x] (a)(12)	1.3		[x] (e)(2) *Amb. only*	1.2	1.6
[x] (a)(13)	1.2		[x] (e)(3) *Amb. only*	1.3	
[x] (a)(14)	1.2		[ ] (f)(1)	1.2	1.2
[x] (a)(15)	1.5		[x] (f)(2)	1.3	1.3
[ ] (a)(16) *Inpt. only*	1.3	1.2	[x] (f)(3)	1.3	1.3
[ ] (a)(17) *Inpt. only*	1.2		[ ] (f)(4) *Inpt. only*	1.3	1.3
[ ] (a)(18)	1.1	1.5	[ ] (f)(5) *Amb. only*	1.2	1.2
[ ] (a)(19)	1.1	1.5			
[ ] (a)(20)	1.1	1.5	[ ] (f)(6) *Amb. only*	1.4	1.4
[x] (b)(1)	1.7	1.4			
[x] (b)(2)	1.4	1.6	[ ] (f)(7) *Amb. only*	1.1	
[x] (b)(3)	1.4	1.4	[ ] (g)(1)	2.0	2.0
[x] (b)(4)	1.3	1.4	[x] (g)(2)	2.0	2.0
[x] (b)(5)	1.4	1.2	[x] (g)(3)	1.4	
[ ] (b)(6) *Inpt. only*	1.3	1.3	[x] (g)(4)	1.2	
[x] (b)(7)	1.4	1.7	[ ] (h)(1)	1.1	
[ ] (b)(8)	1.2	1.2	[ ] (h)(2)	1.1	
[ ] (b)(9)	1.1	1.1	[ ] (h)(3)	1.1	
[x] (c)(1)	1.11	1.11			
[x] (c)(2)	1.11	1.11			

Criteria #	Version		Criteria #	Version	
	TP**	TD***		TP	TD

☐ No criteria tested

*For a list of the 2014 Edition Certification Criteria, please reference http://www.healthit.gov/certification (navigation: 2014 Edition Test Method)

**Indicates the version number for the Test Procedure (TP)

***Indicates the version number for the Test Data (TD)

3.2.7 2014 Clinical Quality Measures*

Type of Clinical Quality Measures Successfully Tested:

- [x] Ambulatory
- [ ] Inpatient
- [ ] No CQMs tested

*For a list of the 2014 Clinical Quality Measures, please the CMS eCQM Library (Navigation: June 2014 and April 2014 Updates)

Ambulatory CQMs							
CMS ID	Version	CMS ID	Version	CMS ID	Version	CMS ID	Version
[x] 2	v4	[ ] 90		[ ] 136		[x] 155	v3
[ ] 22		[ ] 117		[ ] 137		[x] 156	v3
[ ] 50		[ ] 122		[x] 138	v3	[ ] 157	
[ ] 52		[ ] 123		[ ] 139		[ ] 158	
[ ] 56		[ ] 124		[ ] 140		[ ] 159	
[ ] 61		[ ] 125		[ ] 141		[ ] 160	
[ ] 62		[ ] 126		[ ] 142		[ ] 161	
[ ] 64		[x] 127	v3	[ ] 143		[ ] 163	
[ ] 65		[ ] 128		[ ] 144		[ ] 164	
[ ] 66		[ ] 129		[ ] 145		[x] 165	v3
[ ] 68		[ ] 130		[x] 146	v3	[x] 166	v4
[x] 69	v3	[ ] 131		[ ] 147		[ ] 167	
[ ] 74		[ ] 132		[ ] 148		[ ] 169	
[ ] 75		[ ] 133		[ ] 149		[ ] 177	
[ ] 77		[ ] 134		[ ] 153		[ ] 179	
[ ] 82		[ ] 135		[ ] 154		[ ] 182	

Inpatient CQMs							
CMS ID	Version	CMS ID	Version	CMS ID	Version	CMS ID	Version
[ ] 9		[ ] 71		[ ] 107		[ ] 172	
[ ] 26		[ ] 72		[ ] 108		[ ] 178	
[ ] 30		[ ] 73		[ ] 109		[ ] 185	
[ ] 31		[ ] 91		[ ] 110		[ ] 188	
[ ] 32		[ ] 100		[ ] 111		[ ] 190	
[ ] 53		[ ] 102		[ ] 113			
[ ] 55		[ ] 104		[ ] 114			
[ ] 60		[ ] 105		[ ] 171			

3.2.8 Automated Numerator Recording and Measure Calculation

3.2.8.1 Automated Numerator Recording

Automated Numerator Recording Successfully Tested			
☐ (a)(1)	☐ (a)(11)	☐ (a)(18)	☐ (b)(6)
☐ (a)(3)	☐ (a)(12)	☐ (a)(19)	☐ (b)(8)
☐ (a)(4)	☐ (a)(13)	☐ (a)(20)	☐ (b)(9)
☐ (a)(5)	☐ (a)(14)	☐ (b)(2)	☐ (e)(1)
☐ (a)(6)	☐ (a)(15)	☐ (b)(3)	☐ (e)(2)
☐ (a)(7)	☐ (a)(16)	☐ (b)(4)	☐ (e)(3)
☐ (a)(9)	☐ (a)(17)	☐ (b)(5)	

☒ Automated Numerator Recording was not tested

3.2.8.2 Automated Measure Calculation

Automated Measure Calculation Successfully Tested			
☒ (a)(1)	☒ (a)(11)	☐ (a)(18)	☐ (b)(6)
☒ (a)(3)	☒ (a)(12)	☐ (a)(19)	☐ (b)(8)
☒ (a)(4)	☒ (a)(13)	☐ (a)(20)	☐ (b)(9)
☒ (a)(5)	☒ (a)(14)	☒ (b)(2)	☒ (e)(1)
☒ (a)(6)	☒ (a)(15)	☒ (b)(3)	☒ (e)(2)
☒ (a)(7)	☐ (a)(16)	☒ (b)(4)	☒ (e)(3)
☒ (a)(9)	☐ (a)(17)	☒ (b)(5)	

☐ Automated Measure Calculation was not tested

3.2.9 Attestation

Attestation Forms (as applicable)	Appendix
☒ Safety-Enhanced Design*	A
☒ Quality Management System**	B
☒ Privacy and Security	C

*Required if any of the following were tested: (a)(1), (a)(2), (a)(6), (a)(7), (a)(8), (a)(16), (a)(18), (a)(19), (a)(20), (b)(3), (b)(4), (b)(9).

**Required for every EHR product

3.3 Appendices

Attached below.

Test Results Summary Change History

Test Report ID	Description of Change	Date

2014 Edition Test Report Summary

August 15, 2015

Drummond Group, Inc.
13359 North Hwy 183
Austin, TX 78750

Submission of Documented User Centered Design (UCD) Process and Usability Test Results

Dear Drummond Group, Inc.

Daw Systems, Inc. ("DAW") submits this letter and the attachments hereto as formal submission and attestation to the accuracy of the information on the attached Meaningful Use 2014 Edition EHR Usability Test Report for Criteria: **170.314.g.3 – Safety Enhanced Design.**

This document includes test results for and the same workflow was used for all:

- § 170.314(a)(1) (CPOE);
- § 170.314(a)(2) (Drug- drug, drug-allergy interaction checks);
- § 170.314(a)(6) (Medication list);
- § 170.314(a)(7) (Medication allergy list);
- § 170.314(a)(8) (Clinical decision support);
- § 170.314(a)(16) (Electronic medication administration record);
- § 170.314(b)(3) (Electronic prescribing);
- § 170.314(b)(4) (Clinical information reconciliation).

Daw Systems, Inc. understands that Drummond Group reserves the right to publish this letter and attached documentation and reports.

Sincerely,

Adam Forman
COO/GC

EHR Usability Test Report of ScriptSure EMR 9.5

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

Daw Systems, Inc. ScriptSure EMR Version 9.5 Meaningful Use 2014 Ambulatory Edition User Centered Design Report

Date of Usability Testing:	August 3, 2015 to August 6, 2015
Date of Report:	August 14, 2015
Report Prepared by:	Daw Systems, Inc. Adam Forman, COO 866-755-1500 aforman@dawsystems.com 585 Troy-Schenectady Rd, Ste 2 Latham, NY 12110

The study findings were compiled using the NISTIR 7742 Customized Common Industry Format Template for EHR Usability Testing.

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Executive Summary

A usability test of ScriptSure EMR v.9.5 (ambulatory) was conducted on the following dates August 3, 2015- August 6, 2015 by Adam Forman from Daw Systems, Inc. with 5 participants in the healthcare field. The purpose of this test was to test and validate the usability of the current user interface, and provide evidence of usability of ScriptSure EMR v9.5 (ambulatory). During the usability test, 5 healthcare providers matching the target demographic criteria served as participants and used ScriptSure EMR v9.5 (ambulatory) in simulated, but representative tasks.

This study collected performance data on 7 tasks categories typically conducted on an EHR, as outlined in the 170.314(g)(3), Safety-enhanced design certification class:

1. § 170.314(a)(1) (CPOE);
2. § 170.314(a)(2) (Drug- drug, drug-allergy interaction checks);
3. § 170.314(a)(6) (Medication list);
4. § 170.314(a)(7) (Medication allergy list);
5. § 170.314(a)(8) (Clinical decision support);
6. § 170.314(b)(3) (Electronic prescribing);
7. § 170.314(b)(4) (Clinical information reconciliation).

During the 60-minute, one-on-one usability test, each participant that had been screened using Appendix 1, was greeted by the administrator and asked to review and sign a release form (included in Appendix 3); they were instructed that they could withdraw at any time. Participants had prior experience with ScriptSure EMR. As much of the tests were extensions of previously known functionality, no training or help materials was needed. Participants did have access to the ScriptSure EMR online help, but none consulted it during testing. The administrator introduced the test, and instructed participants to complete a series of tasks (given one at a time) using ScriptSure EMR v9.5 (ambulatory). During the testing, the administrator timed the test and logged recorded user performance data on paper and electronically. The administrator did not give the participant assistance in how to complete the task while in progress.

Some screenshots for participant screens were captured during testing and the tests were recorded with screen video recording software. The following types of data were collected for each participant:

- Number of tasks successfully completed within the allotted time without assistance
- Path deviations
- Time to complete the tasks
- Number and types of errors

- Participant's satisfaction ratings of the system
- Comments

Table 1: Summary Results of Usability Tests

All participant data was de-identified – no correspondence could be made from the identity of the participant to the data collected. Following the conclusion of the testing, participants were asked to complete a post-test questionnaire and were not compensated for their time. Various recommended metrics, in accordance with the examples set forth in the NIST Guide to the Processes Approach for Improving the Usability of Electronic Health Records, were used to evaluate the usability of ScriptSure EMR v9.5 (ambulatory). Following is a summary of the performance and rating data collected on ScriptSure EMR v9.5 (ambulatory).

USABILITY TESTING SPREADSHEET						
SUMMARY OF RESULTS OF USABILITY TEST FOR SCRIPTSURE EMR v9.5 (ambulatory)						
TASKS / **Measures**	**N**	**Task Success**	**Path Deviation**	**Task Time**	**Task Ratings 1=Easy to 5=Difficult**	
	#	%	Deviations (Observed / Optimal)	Mean (SD)	Mean (SD)	
170.314(a)(1) Electronically Record Orders in an Ambulatory Setting						
	A.MEDICATIONS ORDERS					
	1. Electronically **Record** Medication Order	5	100%	0	24.90	1
					SD: 5.0685	SD: 0
	2. Electronically **Change** Medication Order	5	60%	0.4	69.92	3.4
					SD: 29.05	SD: 1.14
	3. Electronically **View** Medication Order	5	100%	0	7.74	1
					SD: 1.65	SD: 0
	B. LABORATORY ORDERS					
	1. Electronically **Record** Lab Order	5	100%	0	82.93	3.2
					SD: 24.012	SD: .84
	2. Electronically **Change** Lab Order	5	80%	0.2	169.29	3.4

					SD: 45.28	SD: 1.34
	3. Electronically **View** Lab Order	5	100%	0	9.94	1
					SD: 3.5	SD: 0
	C. RADIOLOGY ORDERS					
	1. Electronically **Record** Radiology Order	5	100%	0.4	81.10	3.2
					SD: 23.63	SD: 0.84
	2. Electronically **Change** Radiology Order	5	100%	0.6	93.90	4.2
					SD: 20.28	SD: 1.1
	3. Electronically **View** Radiology Order	5	100%	0	10.64	1
					SD: 2.77	SD: 0
170.314(a)(2) Drug-drug, drug-allergy interaction checks						
	1. Enter a medication order for a patient that is an allergy.	5	100%	0	9.66	1
					SD: 2	SD: 0
	2. Adjust the tolerance/severity settings of drug-drug checks and drug allergy checks	5	100%	0.2	21.31	2
					SD: 29.62	SD: 1.73
170.314(a)(6) Medication list						
	1. Electronically **Record** Patient Active Med List	5	100%	0	20.03	1
					SD: 3.54	SD: 0
	2. Electronically **Change** Patient Active Med List	5	60%	3	100.31	2.8
					SD: 127.52	SD: 2.05
	3. Electronically **View** Patient Active Med List	5	100%	0	6.79	1
					SD: 1.09	SD: 0
170.314(a)(7) Medication allergy list						

	1. Electronically **Record** Patient Active Med Allergy List	5	100%	0	14.83	1
					SD: 3.1	SD:0
	2. Electronically **Change** Patient Active Med Allergy List	5	100%	0.2	8.75	1.2
					SD: 2.42	SD: 0.45
	3. Electronically **View** Patient Active Med Allergy List	5	100%	0	4.76	1
					SD: 0.5	SD:0
170.314(a)(8) Clinical decision support						
	1. Select/Activate Clinical Decision Support Interventions	5	100%	0	5.96	1
					SD: 1.82	SD: 0
	2. 1 Trigger Clinical Decision Support Interventions – Problem List	5	100%	0	2.68	1
					3.13	SD: 0
	2.2 Trigger Clinical Decision Support Interventions – Medications	5	100%	0	7.962	1
					1.099690866	SD: 0
	2.3 Trigger Clinical Decision Support Interventions – Allergies	5	100%	0	8.4	1
					1.331296361	SD: 0
	2.4 Trigger Clinical Decision Support Interventions – Demographics	5	100%	0	5.496	1
					1.842696394	SD: 0
	2.5 Trigger Clinical Decision Support Interventions – Lab results	5	100%	0	5.564	1
					1.57501746	SD: 0
	2.6 Trigger Clinical Decision Support Interventions – Vitals	5	100%	0	5.342	1
					1.575426926	SD: 0
	3. Identify Diagnostic and Therapeutic Reference Resources	5	100%	0	6.42	1
					SD: 3.45	SD: 0

170.314(b)(3) Electronic prescribing							
	Prescribe a medication for a patient using electronic prescribing	5	100%	0	29.09 SD: 4.54	1 SD: 0	
170.314(b)(4) Clinical information reconciliation							
	1. Reconcile patient's active **med** list with another source	5	100%	0.6	120.25 SD: 41.39	2.6 SD:1.52	
	2. Reconcile patient's active **problem** list with another source	5	100%	0	84.75 SD: 16.48	1.6 SD: 0.55	
	3. Reconcile patient's active **med allergy** list with another source	5	100%	0.2	84.38 SD: 19.67	1 SD: 0	

The results from the System Usability Scale scored the subjective satisfaction with the system based on performance with these tasks to be: 83.5[1]

During and after the tasks, participants commonly commented that the system was easy to use for most tasks. Overall, almost all users found ScriptSure EMR to be easy to use and usable without training. Nearly all participants found that tasks like changing items after entered in the system was difficult. In addition to the performance data, the following qualitative observations were made:

Major findings

All participants responded well to the prescribing and medication process and were for the most part quick with the tasks. For tasks like Lab test and Imaging tests, the labs which were done first seemed to give some trouble, but the imaging which is very similar in process, once they understood the workflow, were much faster. One commented that the similarity and understanding the workflow of labs helped with the workflow of imaging orders. The similarity in design and uniformity of design of the application helped the participants overall orientation to all software features. While all participants were users of the ScriptSure software, they were asked to test functionality their daily activities usually don't involve and to test improvements in the latest version of ScriptSure EMR. There was a high success rate for all tasks. Two tasks proved to be difficult for participants; revolving around changing items. The results from the

[1] Broadly interpreted, scores under 60 represent systems with poor usability; scores over 80 would be considered above average. See Tullis, T. & Albert, W. (2008). Measuring the User Experience. Burlington, MA: Morgan Kaufman (p. 149). http://www.measuringu.com/sus.php

System Usability Scale scored the subjective satisfaction with the system based on performance with these tasks to be: 83.5. The testing time to complete tasks was variable.

Areas for improvement

The ability to *change* orders, medications, labs orders and imaging studies proved difficult for some to understand. After a prescription is sent electronically for example, there is not a way to modify that prescription. The sent prescription can be cancelled and new one created or removed from chart and new prescription created. That is a workflow process that our software has implemented, so understanding the *changing* a prescription as a new user after it is created is not that simple. Re-prescribing the same medication is, but changing an existing one is not. We are looking at ways for that workflow to be more obvious for end users.

Based on the testing, we are combining our drug checks with our drug tolerances on one screen for simpler and more understandable access.

Another area for improvement is with changing of the status a medication on a patient profile. Currently it is a non-descript icon. We are looking at creating the ability to simply select the status and change right there via a link.

We will continue to monitor the ease of use and apply these testing principles to future functional changes and additions to improve the product overall.

INTRODUCTION

The EHRUT tested for this study was ScriptSure EMR v.9.5 (ambulatory), which gives medical providers and clinicians the ability to record and manage patient encounters and charts electronically in an ambulatory outpatient practice setting. ScriptSure EMR v9.5 is a full featured EHR giving medical professionals access to schedule patients, order medications and receive refill requests, order labs and imaging studies and receive lab order results electronically and many of the other tasks medical professionals must perform during patient office visits. E-Prescribing, reconciling medication lists, recording allergies, viewing drug interactions are a few of the features of ScriptSure EMR v9.5 (ambulatory) that was tested. 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 to ensure compliance with the Safety-Enhanced design requirement for 2014 ONC EHR certification and for internal purposes to ensure ease of use for our clients/end users. The results contained herein provide evidence of usability of ScriptSure EMR v9.5 (ambulatory). To this end, measures of effectiveness, efficiency and user satisfaction, such as:

Number of tasks successfully completed within the allotted time without assistance

- Task ratings: Ease and efficiency
- Path deviations
- Time to complete the tasks
- Number of errors
- Ease of use rating/Efficiency rating
- Participant's satisfaction ratings of the system if the task was successful, the time on task, etc., were captured during the usability testing.
- Participant's verbalizations (comments)

User-Centered Design Process

Daw Systems, Inc. (DAW) development benefits from having a practicing physician as its CEO. The design and development process is focused largely on real-world use and is not developed in the vacuum of coding environments. Daw Systems, Inc. follows a user-centric design methodology incorporating the principles of the ISO 9241–210, 2010 standards.

Our software applications are designed with the user in mind first and the requirements of the user and not just the software need or a certification. This process is based on Planning, Research, Analysis, Design (including white boarding and wireframing) and Evaluation/Testing. We begin by wire-framing or white-boarding the application feature(s). DAW staff then research the needs and requirements of our users and the industry to understand our users, the interaction they have or will have with the software and to understand their overall practice needs. After an initial prototype is made, we test and perform QA to ensure proper functioning and then deploy as a Beta to a live site for feedback to further refine the project and functionality.

METHOD

PARTICIPANTS

A total of 5 participants were tested on the ScriptSure EMR v9.5 (ambulatory). We consulted Usability.gov for information on how many users to test. Testing "5 users lets you find almost as many usability problems as you'd find using many more test participants."[2] The Nielsen Norman Group states that "testing more users didn't result in appreciably more insights."[3] Participants in the test were healthcare providers including MDs, RNs and administrative staff. Participants were recruited by Daw Systems, Inc. and were not compensated for their time. Most of the testing was done remotely over web connectivity and phone. Participants were not from the testing or supplier organization. Participants were given the opportunity to have the same orientation and level of training as the actual end users would have received. In addition,

[2] http://www.usability.gov/how-to-and-tools/methods/recruiting-usability-test-participants.html
[3] http://www.nngroup.com/articles/how-many-test-users/

participants had access to the online help menu, but none consulted it during the tests, however, there was nothing to prevent them from consulting it.

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

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, specialty, ScriptSure 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.

TABLE 2: Participant Demographics

Part. ID	Gender	Age	Education/ Role	Specialty	ScriptSure Exper.	EMR Exper.	Assistive Tech needs
1	F	31-40	Some College/ Admin	Family Practice	4 months	8 yrs	None
2	F	41-50	Some College/ Admin	Family Practice	4 yrs	13 yrs	None
3	F	41-50	College/ R.N.	Family Practice	2 yrs	4 yrs	None
4	M	51-60	Graduate/M.D.	Pain Management	2 yrs	5 yrs	None
5	F	21-30	College/Admin	Pain Management	5 months	2 years	None

All of the recruited participants (matching the demographics in the section on Participants) that were recruited participated in the usability test; 100%. None failed to participate.

Participants were scheduled for 60 minute sessions with 5 minutes for instructions to start and the SUS in Appendix 5. In between each session for debrief by the administrator(s) and data logger(s), and to reset systems to proper test conditions. An excel spreadsheet was used to keep track of the participant schedule, and included each participant's demographic characteristics as provided by the DAW. Most of the studies were done on separate days from one another and not immediately back to back.

STUDY DESIGN

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

During the usability test, participants interacted with only ScriptSure EMR. Each participant used the system version, but in some cases did so remotely. All were provided the same instructions. The system was evaluated for effectiveness, efficiency and satisfaction as defined by measures collected and analyzed for each participant:

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

Additional information about the various measures can be found in the Usability Metrics below.

TASKS

A number of tasks were constructed that would be realistic and representative of the kinds of activities a user might do with this EHR, including these, organized by risk within each criteria:

		Risk Assessment
170.314(a)(1) Electronically Record Orders in an Ambulatory Setting		
	A.MEDICATIONS ORDERS	
	1. Electronically **Record** Medication Order	High
	2. Electronically **Change** Medication Order	High
	3. Electronically **View** Medication Order	High
	B. LABORATORY ORDERS	
	1. Electronically **Record** Lab Order	Moderate
	2. Electronically **Change** Lab Order	Moderate
	3. Electronically **View** Lab Order	Moderate
	C. RADIOLOGY ORDERS	

	1. Electronically **Record** Radiology Order	Moderate
	2. Electronically **Change** Radiology Order	Moderate
	3. Electronically **View** Radiology Order	Moderate
170.314(a)(2) Drug-drug, drug-allergy interaction checks		
	1. Enter a medication order for a patient.	High
	2. Adjust the tolerance/severity settings of drug-drug checks and drug allergy checks	High
170.314(a)(6) Medication list		
	1. Electronically **Record** Patient Active Med List	High
	2. Electronically **Change** Patient Active Med List	High
	3. Electronically **View** Patient Active Med List	High
170.314(a)(7) Medication allergy list		
	1. Electronically **Record** Patient Active Med Allergy List	High
	2. Electronically **Change** Patient Active Med Allergy List	High
	3. Electronically **View** Patient Active Med Allergy List	High
170.314(a)(8) Clinical decision support		
	1. Select/Activate Clinical Decision Support Interventions	Moderate
	2. Trigger Clinical Decision Support Interventions	Low
	3. Identify Diagnostic and Therapeutic Reference Resources	Low
170.314(b)(3) Electronic prescribing		
	Prescribe a medication for a patient using electronic prescribing	High
170.314(b)(4) Clinical information reconciliation		
	1. Reconcile patient's active **med** list with another source	Moderate
	2. Reconcile patient's active **problem** list with another source	Moderate
	3. Reconcile patient's active **med allergy** list with another source	Moderate

The above tasks highlight the features of the EHR functionality specified by the ONC for the appropriate test criteria. For each usability test, the test proctor provided sample test data to the test participant by providing a fictitious patient name and record, encounters and data. The same database of patient was used for all participants and test scenarios. The risk assessment column is based on the potential for affect (adverse) on a patient. High, moderate and low risk were prioritized.

PROCEDURES

Prior to each session with a participant, the excel document to be used for recording the findings of the testing was opened on the test proctors computer, out of site of the participant. Remote access was setup for the test participants and before the start of each session, the proctor propositioned a database with only base level test data ready and entered. Test participants were then instructed to navigate to a website where a remote connection could be initiated. Participants were greeted by phone and asked to verify their identity over the phone. Participants were then assigned a participant identification number.

One staff member initiated and ran the test with the test participant and recorded the data and findings. The usability testing staff conducting the test was experienced usability practitioners with more than 10 years of EHR experience, a degree in Sociology and a Juris Doctor degree. Each participant reviewed and signed an informed consent and release form (See Appendix 3). The forms were then faxed or emailed or handed to Daw proctor.

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. The same served as 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.

Task timing began once the administrator finished reading the task/question. The task time was stopped once the participant indicated they had successfully completed the task or said they could not completed the task. Scoring is discussed below in another section.

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

TEST LOCATION

The usability tests were conducted at our corporate office location in Latham, NY using controlled testing environment with appropriate database and fictitious names. The remotes were conducted using BOMGAR remote sessions program and recorded using Camtasia Recorded 8. The screen and audio of each participant could be seen and heard. We consulted

with usability.gov on developing a remote usability test and followed their guidelines.[4] (see below). The test with participants was a moderated remote session.

> ***Developing a Remote Usability Test***
>
> *The processes for developing a remote test are much the same as developing the test and materials for a test you are conducting in-person. Often you can leverage an in-person test you might have run for use in a remote setting. It's important to:*
>
> *Remember that tests should be about 15–30 minutes long made up of about 3-5 tasks. Develop straightforward tasks that have well-defined end states. If you are using a screener, be sure to include the minimum system requirements, both of the site or tool you are testing, but also for the screen sharing service that you propose to use. Make sure you have the correct contact information for your participants for reminders and follow-up if needs be. Prepare introductory and/or test materials so the participants will know what is expected of them as well as what they can expect from you. Prepare test consent forms. Prepare compensations and receipts for compensation should you choose to pay your participants. Remote testing differs mainly is in the technology. You will need to assure that:*
>
> *Whatever you are testing is accessible outside the firewall of **your** business, agency or dev environment.*
>
> *You will need to determine if any firewall issues might affect the ability of your participants to access the site or tool you are testing.*
>
> *Participants can download/access the screen-sharing software, or online remote usability vendor services.*
>
> ***Moderated Remote Usability Testing***
>
> *During moderated remote testing, participants are observed on interacted with while they complete the tasks for the test. Moderated testing is best for complex tasks that do not have a structured sequence of steps or where a more interaction and questioning will benefit testing.*

TEST ENVIRONMENT

The ScriptSure EMR is typically used in a healthcare office or practice and the primary users are secretarial staff, RNs, physicians and other healthcare providers in medical office settings. In this instance, the testing was conducted remotely using a realistic reproduction of a ScriptSure User. For testing, a remote desktop instance on a Windows Server was used. The participants used a mouse and keyboard when interacting with ScriptSure EMR v9.5.

ScriptSure EMR v9.5 (ambulatory) was used on a 1600x1200 resolution and it is not know the capabilities of their remote screens, but they could see colors of the remote application. ScriptSure EMR was set up by the DAW according to the vendor's test specifications. The application itself was running on a Windows server 2008 R2 on a secure internet connection.

[4] http://www.usability.gov/how-to-and-tools/methods/remote-testing.html

Technically, the system performance (i.e., response time) was representative to what actual users would experience in a field implementation.

TEST FORMS AND TOOLS

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

1. Informed Consent
2. Moderator's Guide
3. Post-test Questionnaire (SUS)

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

The participant's interaction with the ScriptSure EMR was captured and recorded digitally with screen capture software running on the test machine.

PARTICIPANT INSTRUCTIONS

Participants were first asked to confirm their demographic information:

- Gender
- Age
- Education/Role
- Specialty
- ScriptSure Experience
- Assistive Tech Needs

The proctor explain the goals for the session, emphasizing the participant's role, urging them to comment without concern for our feelings. The test administrator also reviewed the agenda for the session with the participant prior to beginning the tasks.

The test proctor explained that the participant was going to be asked to complete a series of tasks, quickly, without help from the proctor and without; comments could be made if the tester felt it was necessary. The following instruction was provided:

a. *"Thank you for participating in this study. Your input is very important. Our session today will last about 60 minutes. During that time you will use an instance of an electronic health record. I will ask you to complete a few tasks using this system and answer some questions. You should complete the tasks as quickly as possible making as few errors as possible. Please try to complete the tasks on your own following the instructions very closely. Please note that we are not testing you we are testing the system, therefore if you have difficulty all this means is that something needs to be improved in the system. I will be here in case you need specific help, but I am not able to instruct you or provide help in*

how to use the application. Overall, we are interested in how easy (or how difficult) this system is to use, what in it would be useful to you, and how we could improve it. Any information you provide will be kept confidential and your name will not be associated with your comments at any time. The screen and audio may be recorded. Should you feel it necessary you are able to withdraw at any time during the testing. For each task, I will read the description to you and say "Begin." At that point, please perform the task and say "Done" once you believe you have successfully completed the task. You will be asked to rate on a scale of 1 to 5 the tasks where 1 was Very Easy/Efficient and 5 was Very Difficult/Inefficient. We are using fictitious users and patient names for the testing. We will provide a series of task scenarios for you to complete unaided by us. You should try to perform the task as quickly and as efficiently as possible. I will record the progress and results."

Participants were then given 24 total tasks to complete. Tasks are listed in the moderator's guide in the Appendix 6. The participant was then asked to begin. The Proctor recorded time to complete, errors, and deviations from the optimal path. Any comments that the participant shared during the tasks were recorded.

After each task the participant was asked to rate the ease of use for the task and the task efficient on a Likert scale from 1 to 5 where 1 represented "very easy" / "very efficient" respectively, and 5 represented "very difficult" and "very inefficient," respectively. Testers were given a maximum of 60 minutes for the combined test/tasks.

Participants were given the SUS questionnaire (See Appendix 5) at the conclusion of the test.

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 ScriptSure EMR v9.5 (ambulatory) by measuring participant success rates and errors;
2. Efficiency of ScriptSure EMR v9.5 (ambulatory) by measuring the average task time and path deviations;
3. Satisfaction with ScriptSure EMR v9.5 (ambulatory) by measuring ease of use ratings.

The following were recorded:

- 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

DATA SCORING

The following table details how tasks were scored, errors evaluated, and the time data analyzed.[5]

MEASURE	RATIONALE & SCORING[6] [7]
Effectiveness: Task Success	A task was counted as a "Success" if the participant was able to achieve the correct outcome, without assistance, within the time allotted on a per task basis. The total number of successes were calculated for each task and then divided by the total number of times that task was attempted. The results are provided as a percentage. Task times were recorded for successes. Observed task times divided by the optimal time for each task is a measure of optimal efficiency. Optimal task performance time, as benchmarked by expert performance under realistic conditions, is recorded when constructing tasks. Target task times used for task times in the Moderator's Guide must be operationally defined by taking multiple measures of optimal performance and multiplying by some factor [e.g., 1.25] that allows some time buffer because the participants are presumably not trained to expert performance. Thus, if expert, optimal performance on a task was [x] seconds then allotted task time performance was [x * 1.25] seconds. This ratio should be aggregated across tasks and reported with mean and variance scores.
Effectiveness: Task Failures	If the participant abandoned the task, did not reach the correct answer or performed it incorrectly, or reached the end of the allotted time before successful completion, the task was counted as a "Failures." No task times were taken for errors. The total number of errors was calculated for each task and then divided by the total number of times that task was attempted. Not all deviations would be counted as errors. This should also be expressed as the mean number of failed tasks per participant. On a qualitative level, an enumeration of errors and error types should be collected.
Efficiency: Task Deviations	The participant's path (i.e., steps) through the application was recorded. Deviations occur if the participant, for example, went to a wrong screen, clicked on an incorrect menu item, followed an incorrect link, or interacted incorrectly with an on-screen control. This path was compared to the optimal path. The number of steps in the observed path is divided by the number of optimal steps to provide a ratio of path deviation.
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

[5] Tullis, T. & Albert, W. (2008). Measuring the User Experience. Burlington, MA: Morgan Kaufman. Also see www.measuringusability.com

[6] See Tedesco and Tullis (2006) for a comparison of post-task ratings for usability tests. Tedesco, D. & Tullis, T. (2006) A comparison of methods for eliciting post-task subjective ratings in usability testing. *Usability Professionals association Conference*, June 12 – 16, Broomfield, CO.

[7] The SUS survey yields a single number that represents a composite measure of the overall perceived usability of the system. SUS scores have a range of 0 to 100 and the score is a relative benchmark that is used against other iterations of the system.

	were included in the average task time analysis. Average time per task was calculated for each task. Variance measures (standard deviation and standard error) were also calculated.
Satisfaction: Task Rating	Participant's subjective impression of the ease of use of the application was measured by administering both a simple post-task question as well as a post-session questionnaire. After each task, the participant was asked to rate "Overall, this task was:" on a scale of 1 (Very Difficult) to 5 (Very Easy). These data are averaged across participants. Common convention is that average ratings for systems judged easy to use should be 3.3 or above. To measure participants' confidence in and likeability of the ScriptSure EMR overall, the testing team administered the System Usability Scale (SUS) post-test questionnaire. Questions included, "I think I would like to use this system frequently," "I thought the system was easy to use," and "I would imagine that most people would learn to use this system very quickly." See full System Usability Score questionnaire in Appendix 5.

Table RESULTS. Details of how observed data were scored.

RESULTS

DATA ANALYSIS AND REPORTING

The results of the usability test were calculated according to the methods specified in the Usability Metrics section above. There were several participants that did not understand the test instructions and therefore the results for those participants do not reflect the ideally results for the usability test. Test participants who did not follow the task instructions have their results excluded from this report; none of the participants deviated. There was some misunderstanding that the proctor tried to clarify. Tasks were given 240 seconds max to complete to ensure completion of the test on time.

Effectiveness

The tasks were completed effectively based on the task completion rates. Only 3 tasks proved to be problematic for users. Error rates were low and given there is often the same path to completion, the deviations were low. In terms of general use of the product the users found ScriptSure effective and easy to use.

Efficiency

ScriptSure EMR efficiency can benefit from the placement of setup features that may be consulted often and based on the difficulty users had in changing CPOE items, the efficiency of the product can be improved. The time to complete many tasks was within the range of normal deviation from expert. Some tasks, while performed quickly were impacted by users seeing so much on screen, that they did not understand or see what was asked or what the next step was. Several UI improvements can help with efficiency.

Satisfaction

Participants were overall satisfied with the ScriptSure EMR features based on the comments and the results of the SUS questionnaire. The medication portion testing was particularly satisfying for most users, particularly those with experience with other EMR programs. There

were no errors due to hardware or software. The screens moved quickly and as expected. Overall, the participants demonstrated satisfaction with the application.

During and after the tasks, participants commonly commented that the system was easy to use for most tasks. Overall, almost all users found ScriptSure EMR to be easy to use and usable without training. Nearly all participants found that tasks like changing items after entered in the system was difficult. In addition to the performance data, the following qualitative observations were made:

Major findings

All participants responded well to the prescribing and medication process and were for the most part quick with the tasks. For tasks like Lab test and Imaging tests, the labs which were done first seemed to give some trouble, but the imaging which is very similar in process, once they understood the workflow, were much faster. One commented that the similarity and understanding the workflow of labs helped with the workflow of imaging orders. The similarity in design and uniformity of design of the application helped the participants overall orientation to all software features. While all participants were users of the ScriptSure software, they were asked to test functionality their daily activities usually don't involve and to test improvements in the latest version of ScriptSure EMR. There was a high success rate for all tasks. Two tasks proved to be difficult for participants; revolving around changing items. The testing time to complete tasks was variable.

The results from the System Usability Scale scored the subjective satisfaction with the system based on performance with these tasks to be: 83.5[8]

Areas for improvement

The ability to *change* orders, medications, labs orders and imaging studies proved difficult for some to understand. After a prescription is sent electronically for example, there is not a way to modify that prescription. The sent prescription can be cancelled and new one created or removed from chart and new prescription created. That is a workflow process that our software has implemented, so understanding the *changing* a prescription as a new user after it is created is not that simple. Re-prescribing the same medication is, but changing an existing one is not. We are looking at ways for that workflow to be more obvious for end users.

Based on the testing, we are combining our drug checks with our drug tolerances on one screen for simpler and more understandable access.

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Another area for improvement is with changing of the status a medication on a patient profile. Currently it is a non-descript icon. We are looking at creating the ability to simply select the status and change right there via a link.

We will continue to monitor the ease of use and apply these testing principles to future functional changes and additions to improve the product overall.

RESULTS TABLE:

USABILITY TESTING SPREADSHEET - LOG OF RESULTS

Scenario/Tasks	Assigned Participant #	Task Success 1="yes" 0="no"	Number of Path Deviations	Time to Perform Task (in Seconds)	Errors	Task Ratings (1- Very Easy/Effecicient 5- "Very difficult/Inefficient"	Comments
170.314(a)(1) Electronically Record Orders in an Ambulatory Setting							
A.MEDICATIONS ORDERS							
1. Electronically Record Medication Order	1	1	0	26.8	0	1	Easy
	2	1	0	24.54	0	1	
	3	1	0	19.22	0	1	
	4	1	0	32.37	0	1	
	5	1	0	21.59	0	1	
Mean		1	0	24.904	0	1	
STD Dev		0	0	5.068503724	0	0	

2. Electronically Change Medication Order	1	1	0	54.2	0	3	doesn't like process to delete and do new med
	2	1	0	47.2	0	2	
	3	0	1	114.57	1	4	understood how to prescribe new med, but did not understand how to remove the previous one
	4	0	1	84.12	1	5	"What am I not seeing here? " understood how to prescribe new med, but did not understand how to remove the previous one
	5	1	0	49.5	0	3	Asked "There is no edit button right?"
Mean		0.6	0.4	69.918	1.9	3.4	
STD Dev		0.54772	0.54772256	29.04976626	1.79196	1.140175425	
3. Electronically View Medication Order	1	1	0	7.35	0	1	That's it?
	2	1	0	6.44	0	1	
	3	1	0	7.92	0	1	
	4	1	0	10.48	0	1	
	5	1	0	6.51	0	1	
Mean		1	0	7.74	0	1	
STD Dev		0	0	1.650378744	0	0	

B. LABORATORY ORDERS *stopped at 240 seconds							
1. Electronically Record Lab Order	1	1	0	75.84	0	2	
	2	1	0	46.75	0	3	
	3	1	0	95.55	0	3	asked if needed to enter an ICD-9
	4	1	0	85.63	0	4	
	5	1	0	110.87	0	4	asked what facility - instructed to use default
Mean		1	0	82.928	0	3.2	
STD Dev		0	0	24.01280117	0	0.836660027	
2. Electronically Change Lab Order	1	1	0	118.12	0	2	
	2	1	0	174.89	0	2	Asked what to change it to.
	3	1	0	167.55	0	4	
	4	1	0	145.91	0	4	
	5	0	1	240	1	5	didn't see where to see previous reports
Mean		0.8	0.2	169.294	1.8	3.4	
STD Dev		0.44721	0.4472136	45.27495146	1.93218	1.341640786	
3. Electronically View Lab Order	1	1	0	5.8	0	1	
	2	1	0	11.1	0	1	
	3	1	0	8.41	0	1	
	4	1	0	15.2	0	1	
	5	1	0	9.2	0	1	

Mean		1	0	9.942	0	1	
STD Dev		0	0	3.501473975	0	0	
C. RADIOLOGY ORDERS/Imaging Orders							
1. Electronically Record Radiology Order	1	1	0	70.46	0	3	
	2	1	0	49.3	0	2	
	3	1	1	112.77	1	4	
	4	1	1	91.4	1	4	
	5	1	0	81.59	0	3	same as lab process - would be better to have it look different
Mean		1	0.4	81.104	1.8	3.2	
STD Dev		0	0.54772256	23.6313802	1.61933	0.836660027	
2. Electronically Change Radiology Order	1	1	0	82.21	0	3	
	2	1	0	66.2	0	3	
	3	1	2	110.45	2	5	why can't I just change the x-ray here to something else? Was searching screen for what to do
	4	1	1	95.23	1	5	its not obvious you have to cancel to change it.
	5	1	0	115.47	0	5	I understand I have to cancel it and create a new one, but only because that is how I did on the labs

Mean		1	0.6	93.912	2.4	4.2	
STD Dev		0	0.89442719	20.27857046	2.1187	1.095445115	
3. Electronically View Radiology Order	1	1	0	8.69	0	1	
	2	1	0	14.51	0	1	had trouble finding imaging in the chart navi
	3	1	0	7.47	0	1	
	4	1	0	11.96	0	1	
	5	1	0	10.58	0	1	
Mean		1	0	10.642	0	1	
STD Dev		0	0	2.764700707	0	0	

170.314(a)(2) Drug-drug, drug-allergy interaction checks

1. Enter a medication order for a patient that is an allergy.	1	1	0	8.1	0	1	
	2	1	0	10.24	0	1	
	3	1	0	9.41	0	1	
	4	1	0	12.77	0	1	
	5	1	0	7.8	0	1	
Mean		1	0	9.664	0	1	
STD Dev		0	0	1.997756241	0	0	
2. Adjust the tolerance/severity settings of drug-drug checks and drug allergy checks	1	1	0	9.45	0	1	
	2	1	0	10.24	0	1	
	3	1	1	74.2	1	5	Couldn't find setup

							menu button
	4	1	0	6.89	0	1	
	5	1	0	5.76	0	2	didn't understand to click close to shut window
Mean		1	0.2	21.308	1.1	2	
STD Dev		0	0.4472136	29.62387331	1.52388	1.732050808	

170.314(a)(6) Medication list

1. Electronically Record Patient Active Med List	1	1	0	20.67	0	1	
	2	1	0	19.41	0	1	
	3	1	0	25.12	0	1	
	4	1	0	15.2	0	1	
	5	1	0	19.77	0	1	
Mean		1	0	20.034	0	1	
STD Dev		0	0	3.5390154	0	0	
2. Electronically Change Patient Active Med List	1	0	1	240	1	5	Can I just click the word new prescription to change it
	2	0	2	240	2	5	Where is the status button
	3	1	0	7.4	0	2	I only know how to do this from using system for a while. I wouldn't know this as a new user.

	4	1	0	5.99	0	1	
	5	1	0	8.15	0	1	
Mean		0.6	0.6	100.308	1.7	2.8	
STD Dev		0.54772	0.89442719	127.5231237	1.88856	2.049390153	
3. Electronically View Patient Active Med List	1	1	0	5.89	0	1	
	2	1	0	6.48	0	1	
	3	1	0	8.11	0	1	
	4	1	0	7.45	0	1	
	5	1	0	5.46	0	1	
Mean		1	0	6.678	0	1	
STD Dev		0	0	1.094335415	0	0	

170.314(a)(7) Medication allergy list

1. Electronically Record Patient Active Med Allergy List	1	1	0	12.94	0	1	
	2	1	0	11.45	0	1	
	3	1	0	16.25	0	1	
	4	1	0	14.1	0	1	
	5	1	1	19.41	1	1	misspelled penicillin
Mean		1	0.2	14.83	0.2	1	
STD Dev		0	0.4472136	3.103312746	0.44721	0	
2. Electronically Change Patient Active Med Allergy List	1	1	0	12.68	0	2	Asked if the pen icon on screen was to modify
	2	1	0	7.65	0	1	

	3	1	0	7.1	0	1	
	4	1	0	9.47	0	1	Nearly archived the allergy - but then clicked modify
	5	1	1	6.87	1	1	
Mean		1	0.2	8.754	0.2	1.2	
STD Dev		0	0.4472136	2.42023346	0.44721	0.447213595	
3. Electronically View Patient Active Med Allergy List	1	1	0	4.89	0	1	
	2	1	0	4.33	0	1	
	3	1	0	4.15	0	1	
	4	1	0	5.32	0	1	
	5	1	0	5.12	0	1	
Mean		1	0	4.762	0	1	
STD Dev		0	0	0.504251921	0	0	

170.314(a)(8) Clinical decision support

1. Select/Activate Clinical Decision Support Interventions	1	1	0	4.23	0	1	
	2	1	0	5.21	0	1	
	3	1	0	4.56	0	1	
	4	1	0	8.21	0	1	
	5	1	0	7.58	0	1	
Mean		1	0	5.958	0	1	
STD Dev		0	0	1.816747093	0	0	

2. 1 Trigger Clinical Decision Support Interventions – Problem List	1	1	0	6.51	0	1	
	2	1	0	4.19	0	1	
	3	1	0	4.85	0	1	
	4	1	0	3.56	0	1	
	5	1	0	3.26	0	1	
Mean		1	0	4.474	0	1	
STD Dev		0	0	1.291948141	0	0	
2.2 Trigger Clinical Decision Support Interventions – Medications	1	1	0	8.47	0	1	
	2	1	0	6.22	0	1	
	3	1	0	8.36	0	1	
	4	1	0	9.1	0	1	
	5	1	0	7.66	0	1	
Mean		1	0	7.962	0	1	
STD Dev		0	0	1.099690866	0	0	
2.3 Trigger Clinical Decision Support Interventions – Allergies	1	1	0	9.25	0	1	
	2	1	0	10.14	0	1	
	3	1	0	7.66	0	1	
	4	1	0	6.74	0	1	
	5	1	0	8.21	0	1	
Mean		1	0	8.4	0	1	
STD Dev		0	0	1.331296361	0	0	

2.4 Trigger Clinical Decision Support Interventions – Demographics	1	1	0	6.2	0	1	
	2	1	0	3.99	0	1	
	3	1	0	3.14	0	1	
	4	1	0	6.7	0	1	
	5	1	0	7.45	0	1	
Mean		1	0	5.496	0	1	
STD Dev		0	0	1.842696394	0	0	
2.5 Trigger Clinical Decision Support Interventions – Lab results	1	1	0	6.47	0	1	
	2	1	0	5.13	0	1	
	3	1	0	5.52	0	1	
	4	1	0	7.45	0	1	
	5	1	0	3.25	0	1	
Mean		1	0	5.564	0	1	
STD Dev		0	0	1.57501746	0	0	
2.6 Trigger Clinical Decision Support Interventions – Vitals	1	1	0	7.11	0	1	
	2	1	0	4.78	0	1	
	3	1	0	6.93	0	1	
	4	1	0	4.12	0	1	
	5	1	0	3.77	0	1	
Mean		1	0	5.342	0	1	
STD Dev		0	0	1.575426926	0	0	

3. Identify Diagnostic and Therapeutic Reference Resources	1	1	0	5.14	0	1	
	2	1	0	12.57	0	1	Clicked allergy by accident first
	3	1	0	4.56	0	1	
	4	1	0	4.95	0	1	
	5	1	0	4.87	0	1	
Mean		1	0	6.418	0	1	
STD Dev		0	0	3.445427405	0	0	

170.314(b)(3) Electronic prescribing

Prescribe a medication for a patient using electronic prescribing	1	1	0	25.76	0	1	
	2	1	0	29.14	0	1	
	3	1	0	26.74	0	1	
	4	1	0	36.9	0	1	
	5	1	0	26.9	0	1	
Mean		1	0	29.088	0	1	
STD Dev		0	0	4.538889732	0	0	

170.314(b)(4) Clinical information reconciliation

1. Reconcile patient's active med list with another source	1	1	0	87.88	0	3	
	2	1	0	92.55	0	1	
	3	1	1	135.41	1	4	accident
	4	1	0	99.1	0	1	
	5	1	2	186.29	2	4	clicked ignore

							instead of save
Mean		1	0.6	120.246	0.6	2.6	
STD Dev		0	0.89442719	41.39304446	0.89443	1.516575089	
2. Reconcile patient's active problem list with another source	1	1	0	71.4	0	2	
	2	1	0	84.1	0	1	
	3	1	0	110.4	0	2	
	4	1	0	69.4	0	1	
	5	1	0	88.46	0	2	
Mean		1	0	84.752	0	1.6	
STD Dev		0	0	16.47690869	0	0.547722558	
3. Reconcile patient's active med allergy list with another source	1	1	0	95.6	0	1	
	2	1	0	112.7	0	1	
	3	1	1	78.94	1	1	Clicked wrong button
	4	1	0	65.24	0	1	
	5	1	0	69.4	0	1	
Mean		1	0.2	84.376	0.2	1	
STD Dev		0	0.4472136	19.67386795	0.44721	0	

Appendices

The following appendices include supplemental data for this usability test report:

Appendix 1: SAMPLE RECRUITING SCREENER

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

Recruiting Script for Recruiting Participants

Hello, my name is Adam Forman, I am calling from ScriptSure EMR. We are recruiting individuals to participate in a usability study for an electronic health record. We would like to ask you a few questions to see if you qualify and if would like to participate. This should only take a few minutes of your time. This is strictly for research purposes. Can I ask you a few questions?

[If not obvious] Are you male or female? _____

Do you, or does anyone in your home, work in marketing research, usability research, web design […etc.]? [If yes, Terminate] _____

Do you, or does anyone in your home, have a commercial or research interest in an electronic health record software or consulting company? [If yes, Terminate] _____

Which of the following best describes your age? [21 to 30, 31-40, 41-50, 51-60, 61-70, 71-80 and older] [Recruit Mix] _____

Do you require any assistive technologies to use a computer? [if so, please describe] _____

_____

What is your current position/title? (Must be healthcare provider)

_____RN: Specialty _____

_____Physician: Specialty _____

_____Administrative Staff

_____Other _____

How long have you held this position? _____

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

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

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

_____

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

_____

How many years have you used an electronic health record?

_____

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

Can you participate now? If not, would you be able to participate on [date, time]?

_____

Name of participant: _____

Address: _____

City, State, Zip: _____

Daytime phone number: _____

Evening phone number: _____

Alternate [cell] phone number: _____

Email address: _____

This study will take place remotely in many instances. I will confirm your appointment a couple of days before your session and provide you with directions to our office. What time is the best time to reach you?

Appendix 2: PARTICIPANT DEMOGRAPHICS

Following is a high-level overview of the participants in this study. All selected participants match the previously stated description of the intended users above: primary ScriptSure EMR users are secretarial staff, RNs, physicians and other healthcare providers in medical office settings. See the **Education/Role** column below for participant roles.

Total of 5 participants (Men: 1 Women: 4)

Gender	**Number**	**Percentage of Total**
Men	1	20%
Women	4	80%

Specialties	**Number**	**Percentage of Total**
Pain Management	2	40%
Family Practice	3	60%

Education/Role:	**Number**	**Percentage of Total**
High School/Admin	3	60%
RN/APRN	1	20%
MD/DO	1	20%

Part. ID	**Gender**	**Age**	**Education/ Role**	**Specialty**	**ScriptSure Exper.**	**EMR Exper.**	**Assistive Tech needs**
1	F	31-40	Some College/ Admin	Family Practice	4 months	8 yrs	None

2	F	41-50	Some College/ Admin	Family Practice	4 yrs	13 yrs	None
3	F	41-50	College/ R.N.	Family Practice	2 yrs	4 yrs	None
4	M	51-60	Graduate/ M.D.	Pain Management	2 yrs	5 yrs	None
5	F	21-30	College/ Admin	Pain Management	5 months	2 years	None

Appendix 3: NON-DISCLOSURE AGREEMENT AND INFORMED CONSENT FORM

Non-Disclosure Agreement/Consent Form for ScriptSure EMR Test Cases

THIS AGREEMENT is entered into as of the date listed below, between

_____ ("the Participant") and Daw Systems, Inc. located at 585 troy-Schenectady Rd, Latham, NY 12110

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

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

Any information the Participant acquires relating to this product during this study is confidential and proprietary to Test Company and is being disclosed solely for the purposes of the

Participant's participation in today's usability study. By signing this form the Participant acknowledges that s/he will receive monetary compensation for feedback and will not disclose this confidential information obtained today to anyone else or any other organizations.

Participant's printed name: _____

Signature: _____ Date: _____

Informed Consent Form For ScriptSure EMR Test Cases

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

Agreement

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

I understand and agree that the purpose of this study is to make software applications more useful and usable in the future and that my test results can be used. I understand there may be screen shots or recordings of our interactions.

I understand and agree that the data collected from this study may be shared with outside of Daw Systems, Inc. or outside resources or clients. I understand and agree that data confidentiality is assured, because only de-identified data – i.e., identification numbers not names – will be used in analysis and reporting of the results.

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

Please check one of the following:

☐ YES, I have read the above statement and agree to be a participant.

☐ NO, I choose not to participate in this study.

Proctor: Adam Forman

Signature: _____ Date: _____

Appendix 4: MODERATOR'S GUIDE & TESTING PROCEDURE

Moderator should complete the below for each participant and record findings on the excel document for recording data results.

Administrator and Data Logger: Adam Forman

Date: _____ Time: _____

Assigned Participant #: _____ Location: Bomgar session/Daw corporate office

PRE-TEST SETUP

1. Login to fictitious ScriptSure user jhealam user on version ScriptSure EMR 9.5
2. Ensure ScriptSure environment functioning correctly
3. Be sure the database is configured correctly for the test:
    a. RESET DATABASE TO STATIC SCRIPTSURE SQL DATABASE FOR TESTING
4. Setup presentation mode on Bomgar
5. Open excel spreadsheet to record all data

Pre-Test and Participant Instructions:

2. Reset application
3. Complete a Setup sheet for the participant to be able to correctly identify the data recorded – assign a user #.
4. Record date and time of test.
5. Start session recordings with Camtasia Studio
6. Call Participant
    a. Provide the web address for the presentation
    b. Ensure participant can view the application and is signed in using jhealam account.

7. Read following greeting statement to Participant to orient the user and explain our goals:

   "Thank you for participating in this study. Your input is very important. Our session today will last about 60 minutes. During that time you will use an instance of an electronic health record. I will ask you to complete a few tasks using this system and answer some questions. You should complete the tasks as quickly as possible making as few errors as possible. Please try to complete the tasks on your own following the instructions very closely. Please note that we are not testing you we are testing the system, therefore if you have difficulty all this means is that something needs to be improved in the system. I will be here in case you need specific help, but I am not able to instruct you or provide help in how to use the application. Overall, we are interested in how easy (or how difficult) this system is to use, what in it would be useful to you, and how we could improve it. Any information you provide will be kept confidential and your name will not be associated with your comments at any time. The screen and audio may be recorded. Should you feel it necessary you are able to withdraw at any time during the testing. For each task, I will read the description to you and say "Begin." At that point, please perform the task and say "Done" once you believe you have successfully completed the task. You will be asked to rate on a scale of 1 to 5 the tasks where 1 was Very Easy/Efficient and 5 was Very Difficult/Inefficient. We are using fictitious users and patient names for the testing. We will provide a series of task scenarios for you to complete unaided by us. You should try to perform the task as quickly and as efficiently as possible. I will record the progress and results."
8. *ASK:* Do you have any questions or concerns?
9. *ASK:* Record participant demographics:
   a. Ask gender if not obvious on phone.
   b. What is your age range:
      i. 21-30?
      ii. 31-40?
      iii. 41-50?
      iv. 51-60?
      v. 61-70?
      vi. 71-80?
   c. What is your education level and role at the practice?
   d. What is your practices specialty?
   e. How long have you used ScriptSure EMR?
   f. Do you need any assistive tech needs to complete the testing?

10. Record time to complete, errors, and deviations from the optimal path on spreadsheet. Any comments that the participant shared during the tasks were recorded.
11. Read each task according to the script provided:

SPECIFIC PARITICIPANT INSTRUCTIONS FOR TASKS

The following is table to be asked in order to participants: Results are to be recorded on the USABILITY TEESTING SPREADSHEET – LOG OF RESULTS. For each participant record results directly onto results log in excel.

Task Success 1="yes" 0="no"	Number of Path Deviations	Time to Perform Task (in Seconds)	Task Ratings (1-Very Easy/Efficient 5-"Very difficult/Inefficient"	Comments

TABLE OF TASKS

TASK #	TASK DESCRIPTION	INSTRUCTIONS TO PARTICIPANT	CORRECT PATH
170.314(a)**(1) – A-1**	1. Electronically Record Medication Order	Select "John Patient" and access the Drug tab and prescribe Amoxicillin 250 mg Cap	Select patient, click drug Tab, search for Amoxiicillin double click the drug, select 250mg Cap from drop down and then click Print/pharmacy direct/Save only from preview window
170.314(a)**(1) – A-2**	2. Electronically Change Medication Order (dose)	Access "John Patient" chart and remove Amoxil 250mg Cap and prescribe Amoxicillin to 500mg Tab	Right click on the drug row for Amoxil 250mg Cap and click delete – enter comment. Prescribe new medication Amoxil 500mg tab.
170.314(a)**(1) – A-3**	3. Electronically View Medication Order	View medication history for the patient	Select a patient and be sure on prescription tab of chart
170.314(a)**(1) – B-1**	1. Electronically Record Lab Order	Using John Patient, select lab test and Create an Printed lab order for patient – CBC with differential and print and send it to Labcorp Birmingham (Dr. W. Mayfield)	Using John Patient, select lab test the printed order then click next and then select CBC with differential then click Save Only
170.314(a)**(1) – B-2**	2. Electronically Change Lab Order	Select John Patient, click lab tests, click VIEW and archive the order and create a new one.: hemoglobin	Select patient, click lab tests, click modify, when screen opens, select Save only.
170.314(a)**(1) – B-3**	3. Electronically View Lab Order	Select John Patient and located lab orders in chart	Select patient – click navigation Lab Tests and
170.314(a)**(1) – C-1**	1. Electronically Record Radiology Order	Using John Patient, select lab test and Create an Printed imaging order for patient – Select dual energy x-ray	Using John Patient, select lab test the printed order then click next and then

			select Dual energy X-ray. Select Save.
170.314(a)**(1) – C-2**	2. Electronically Change Radiology Order	Select John Patient, click imaging, click VIEW and archive the order and create a new one.: MRI	Select patient, click lab tests, click modify, when screen opens, select Save only.
170.314(a)**(1) – C-3**	3. Electronically View Radiology Order	Select John Patient and located imaging in chart	Select patient – click navigation Lab Tests and view orders
170.314(a)**(2) – 1**	1. Enter a medication order for a patient.	Select John Patient and then select Coumadin Oral to prescribe – any strength (this is a known allergy) Do you see warning?	Select patient, click Drug tab, find Coumadin and select it. Drug allergy Warning shows.
170.314(a)**(2) – 2**	2. Adjust the tolerance/severity settings of drug-drug checks and drug allergy checks	Using John Patient, change the drug-drug interaction check *tolerances* in the setup Menu from undetermined severity to Severe interaction	Click Setup menu, click Drug tolerances, in the drop down change from undetermined severity to Severe Interaction
170.314(a)**(6) – 1**	1. Electronically Record Patient Active Med List	Using john patient. Re-prescribe Prescribe Crestor and see it on the chart	Select patient, see crestor, click represcribe click Ok on preview and then verify it recorded
170.314(a)**(6) – 2**	2. Electronically Change Patient Active Med List	Using John patient, change the status of Crestor to Discontinued	In patient chart, click the status icon and change to discontinued
170.314(a)**(6) – 3**	3. Electronically View Patient Active Med List	Select john patient – view meds	Select patient and view
170.314(a)**(7) – 1**	1. Electronically Record Patient Active Med Allergy List	Select john Patient – Click allergies tab and add penicillamine group as an allergy. Do not enter comment or severity level.	Select patient, Click allergies, click add, search for “penicillamine” click select, click OK.
170.314(a)**(7) – 2**	2. Electronically Change Patient Active Med Allergy List	From the allergy part of chart, click the icon to modify Penicillamine allergy. Add a comment “Hives.”	Click edit button enter hives and click ok.
170.314(a)**(7) – 3**	3. Electronically View Patient Active Med Allergy List	Select patient, click Allergy tab	Select patient, click Allergy tab.
170.314(a)**(8) – 1**	1. Select/Activate Clinical Decision Support Interventions	Enter the setup menu and click ALL Rules. Turn on the rules for Problems, medications, Allergies, Demographics, Lab Test and results, Vitals.	Enter the setup menu and click Rules. Turn on the rule for Problems, medications, Allergies, Demographics, Lab Test and results, Vitals. Click save.
170.314(a)**(8) – 2**	2. 1 Trigger Clinical Decision Support Interventions – Problem List	Select John patient – view CDS in Meaningful use Slider. View the Hypertension CDS - Problem List	Select John patient – view CDS for problem list in Meaningful use Slider. View the CDS alert in the slider bar. See the hypertension alert in slider.
170.314(a)**(8) – 2**	2.2 Trigger Clinical Decision Support Interventions – Medications	Select Jane patient – view CDS in Meaningful use Slider. View the Medication alert.	Select Jane patient – view CDS in Meaningful use Slider. View the CDS alert

			for medication "Amoxil" in the slider bar.
170.314(a)**(8) – 2**	2.3 Trigger Clinical Decision Support Interventions – Allergies	Select Joan Patient. View CDS in Meaningful use Slider. View the Allergy alert.	Select Joan Patient. View the CDS alert for Allergy Coumadin.
170.314(a)**(8) – 2**	2.4 Trigger Clinical Decision Support Interventions – Demographics	Select Jeremy Patient. View CDS in Meaningful use Slider. View the Demographics alert.	Select Jeremy Patient. View the CDS alert for demographic over 40 years old.
170.314(a)**(8) – 2**	2.5 Trigger Clinical Decision Support Interventions – Lab results	Select Jimmy Patient. View CDS in Meaningful use Slider. View the Lab Tests and Results alert.	Select Jimmy Patient Lab Tests and Results for CBC out of range.
170.314(a)**(8) – 2**	2.6 Trigger Clinical Decision Support Interventions – Vitals	Select Judy Patient. View CDS in Meaningful use slider and View the vitals alert.	Select Judy Patient. View the CDS alert for Vital of 300lbs
170.314(a)**(8) – 3**	3. Identify Diagnostic and Therapeutic Reference Resources	Select John Patient and view the CDS alert bibliography and resource info links for hypertension. Select the PROBLEM rule. View reference area/Bibliography area	Select John Patient. View Bibliography in the slider for the hypertension alert OR Enter the setup menu and click Rules. Select the PROBLEM rule. View reference area/Bibliography area – user can do either.
170.314(b)**(3)**	Prescribe a medication for a patient using electronic prescribing	Select "John Patient" and access the Drug tab and prescribe Nexium form favorite list - 40 mg Cap. Click E-Prescribe and select from the practice common the test pharmacy	Select "John Patient" and access the Drug tab and prescribe Nexium form favorite list - 40 mg Cap. Click E-Prescribe and select from the practice common the test pharmacy
170.314(b)**(4) – 1**	1. Reconcile patient's active med list with another source	From home Screen, click Import/Export and open the file XXXXCCD provided by proctor. When it opens click save on the first medication. Then select the patient and verify it imported the medication. Set the status of the medication as Active.	From home Screen, click Import/Export and open the file XXXXCCD provided by proctor. When it opens click save on the first medication. Then select the patient and verify it imported the medication. Set the status of the medication as Active.
170.314(b)**(4) – 2**	2. Reconcile patient's active problem list with another source	From home Screen, click Import/Export and open the file XXXXCCD provided by proctor. When it opens click save on the first hypertension problem. Then select the patient and verify it imported the problem.	From home Screen, click Import/Export and open the file XXXXCCD provided by proctor. When it opens click save on the first hypertension problem. Then select the patient and verify it imported the problem.

170.314(b)**(4) – 3**	3. Reconcile patient's active med allergy list with another source	From home Screen, click Import/Export and open the file XXXXCCD provided by proctor. When it opens click save on the first allergy. Then select the patient and verify it imported the allergy imported.	From home Screen, click Import/Export and open the file XXXXCCD provided by proctor. When it opens click save on the first allergy. Then select the patient and verify it imported the allergy imported.

Final Questions (5 Minutes)

1. Back up all video and documents and log file
2. Administer the SUS questionnaire
3. End session recordings when complete

Appendix 5: SYSTEM USABILITY SCALE QUESTIONNAIRE

	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

Assigned Participant #: _____

APPENDIX 6: SUS RESULTS

http://www.measuringu.com/sus.php

	QUESTIONNAIRE										
Participants	q1	q2	q3	q4	q5	q6	q7	q8	q9	q10	SUS Score
1	5	1	5	1	5	1	5	1	5	2	97.5
2	5	1	5	1	5	2	5	1	5	1	97.5
3	4	3	4	3	3	3	4	3	3	4	55
4	5	1	5	1	5	1	2	4	4	2	80
5	5	2	4	1	5	1	5	2	4	2	87.5
										Mean	**83.5**

August 24, 2015

Drummond Group, Inc.
13359 North Hwy 183
Austin, TX 78750

Quality Management System (QMS) Attestation

Dear Drummond Group, Inc.,

Daw Systems, Inc. ("DAW") submits this letter as attestation to the hereto as formal submission and attestation that ISO 9001 as well as our home-grown corporate designated Quality Management System (QMS) is used in the development, testing and implementation of ScriptSure EMR v9.5 (ambulatory) for the 2014 Edition EHR certification criteria as defined in 45 CFR 170.102 for complete ambulatory EHR. These systems and standards are used for by our company for:

- Product Development
- Bug fixes and documentation
- Application Improvements
- Customer complain resolution
- Meaningful Use compliance

Agile methodology and Scrum resemble our home-grown design and code creation approach. Microsoft Visual Studio Team Edition is used for tracking additions, changes and bug fixes and for version control.

Daw Systems, Inc. understands that Drummond Group reserves the right to publish this letter and attached documentation and reports.

Sincerely,

Adam Forman
COO/GC
Date: 8/24/2015

September 1, 2015

Drummond Group, Inc.
13359 North Hwy 183
Austin, TX 78750
bill@drummondgroup.com

SECURITY ATTESTATION LETTER 314.d.7

Product Name: ScriptSure EMR v9.5
Re: Test Criteria: §170.314(d)(7), Encryption of Data at Rest

Dear Drummond Group, Inc.,

This document details the security controls in place to conform with the security certification criteria §170.314(d)(7):

For the following sections of the criteria [IN170.314(d)(7) – 1.01, 1.02, 2.01, 2.02, 3.01:
The above sections do not apply as ScriptSure EMR v9.5 (ambulatory) prevents local storage on end-user device after it is stopped.

For the following sections of the criteria [IN170.314(d)(7): - 4.01 – 4.02

- [**IN170.314(d)(7) – 4.01**] No electronic health information from the EHR technology session is locally stored on the end-user device.
- [**IN170.314(d)(7) – 4.02**] If 3rd party solution is used, method(s) is sufficiently verified by Proctor along with supporting documentation sufficiently prevent electronic health information from remaining on end-user devices after use of EHR technology on those devices has stopped.

We do not allow data to reside on the machine in temporary files. Once the application closes, or the application boots the temporary files are removed from the machine. Thus no HIPPA protected information remains on the computer.

We have a single directory c:\daw\printout that contains these temporary files. WE DO NOT use windows temporary directories to ensure all temporary files are contained in a controlled path on the drive.

Sincerely,

Adam Forman
COO/GC
Date: 9/1/2015

August 28, 2015

Drummond Group, Inc.
13359 North Hwy 183
Austin, TX 78750
bill@drummondgroup.com

SECURITY ATTESTATION LETTER 314.d.2

Product Name: ScriptSure EMR v9.5

Re: Test Criteria: §170.314(d)(2), Auditable events and tamper-resistance

Dear Drummond Group, Inc.,

This document details the security controls in place to conform with the security certification criteria §170.314(d)(2), Auditable events and tamper-resistance. Daw Systems, Inc. attests the following security controls are in place and that the following settings, permission, logs protection, recording and detection measures are in place in ScriptSure EMR v9.5 in compliance with 314.d.2:

§170.314(d)(2) Auditable events and tamper-resistance.

(i) Record actions.

(A) Record actions related to electronic health information in accordance with the standard specified §170.210(e)(1);

(B) Record the audit log status (enabled or disabled) in accordance with the standard specified in §170.210(e)(2) unless it cannot be disabled by any user; and

(C) Record the encryption status (enabled or disabled) of electronic health information locally stored on end-user devices by EHR technology in accordance with the standard specified in §170.210(e)(3) unless the EHR technology prevents electronic health information from being locally stored on end-user devices (see 170.314(d)(7) of this section).

(ii) Default setting. EHR technology must be set by default to perform the capabilities specified in paragraph (d)(2)(i)(A) of this section and, where applicable, paragraphs (d)(2)(i)(B) or (d)(2)(i)(C), or both paragraphs (d)(2)(i)(B) and (C).

(iii) When disabling the audit log is permitted. For each capability specified in paragraphs (d)(2)(i)(A), (B), and (C) of this section that EHR technology permits to be disabled, the ability to do so must be restricted to a limited set of identified users.

(iv) Audit log protection. Actions and statuses recorded in accordance with paragraph (d)(2)(i) must not be capable of being changed, overwritten, or deleted by the EHR technology.

(v) Detection. EHR technology must be able to detect whether the audit log has been altered.

§170.210 Standards for health information technology to protect electronic health information created, maintained, and exchanged.

(e)(1) Record actions related to electronic health information, audit log status, and encryption of end-user devices.

(i) The audit log must record the information specified in sections 7.2 through 7.4, 7.6 and 7.7 of the standard specified at §170.210(h) when EHR technology is in use.

(ii) The date and time must be recorded in accordance with the standard specified at §170.210(g).

(e)(2)(i) The audit log must record the information specified in sections 7.2 and 7.4 of the standard specified at §170.210(h) when the audit log status is changed.

(ii) The date and time each action occurs in accordance with the standard specified at §170.210(g).

(e)(3) The audit log must record the information specified in sections 7.2 and 7.4 of the standard specified at §170.210(h) when the encryption status of electronic health information locally stored by EHR technology on end-user devices is changed. The date and time each action occurs in accordance with the standard specified at §170.210(g).

(g) Synchronized clocks. The date and time recorded utilize a system clock that has been synchronized following (RFC 1305) Network Time Protocol, (incorporated by reference in §170.299) or (RFC 5905) Network Time Protocol Version 4, (incorporated by reference in §170.299).

(h) Audit log content. ASTM E2147-01 (Reapproved 2009), (incorporated by reference in §170.299)

To summarize, ScriptSure EMR does NOT allow any user to:

- Disable audit log configuration.
- Change the settings of audit log.
- Change the encryption status of audit logs.
- Modify, update or delete any existing audit log entry.
- Protect Audit Log: ScriptSure EMR does not allow any user to update, modify, or delete any audit log.
- Actions are tracked by the audit log in an identical manner for all users of the EMR.
- No practice or user of EMR is allowed to modify these settings.
- The actions of an EMR user are tracked irrespective of their role in a practice or whether they are a verified practitioner.
- The audit logs are stored in the SQL server database file for the practice strong security controls and password protection.
- Detect Audit Log Alteration: Our policies and procedures and controls bar tampering with PHI. Changes to the audit log at the server db level are captured using features of SQL server to maintain a log of those changes so that server level changes cannot be made without detection.

Sincerely,

Adam Forman
COO/GC
Date: 8/28/2015