Real World Testing Results

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General Information

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Developer Real World Test Plan Page URL: https://astronautehr.com/index.php/real-world-test-plan/
Developer Real World Test Results Page URL: https://astronautehr.com/index.php/real-world-test-results/

Background

As stated in the Real World Testing Results Template, under the ONC Health IT Certification Program (Certification Program), health IT developers are required to conduct Real World Testing of their certified health IT (45 CFR 170.405). The Office of the National Coordinator for Health Information Technology (ONC) issues Real World Testing resources to clarify health IT developers' responsibilities for conducting Real World Testing, to identify topics and specific elements of Real World Testing that ONC considers a priority, and to assist health IT developers in developing their Real World Testing plans and results reports.

This report was prepared using the Real World Testing Results template to ensure a cohesive and informative document. Our objective is to address the goals outlined in our initial test plan while presenting our findings in the appropriate context. Data for this report was aggregated from our database, which serves as the foundation for and is directly connected to our certified EHR, Astronaut. All collected data is metric-based and does not include any Protected Health Information (PHI). With multiple facilities utilizing Astronaut, we have effectively demonstrated its real-world application, primarily in psychiatric care but also in general medicine. The test results for each criterion are detailed in the following sections.

Changes to Original Plan

Summary of Change	Reason	Impact
Additional Care Setting - Methadone Clinic	We recently started providing our software to a Methadone Clinic. This is the first instance of a Methadone Clinic using Astronaut for therapy charting and dosing notes.	Expanding our care settings gives us a better idea on how Astronaut is suitable for multiple types of facilities while also showing us areas where we can improve.

Withdrawn Products

Product Name(s):	**N/A**
Version Number(s):	
CHPL Product Number(s):	
Date(s) Withdrawn:	
Inclusion of Data in Results Report:	

Summary of Testing Methods and Key Findings

Our Real World Testing focused on evaluating key performance metrics, with an emphasis on system reliability and the interoperability features implemented in compliance with ONC regulations. To ensure a comprehensive assessment, we employed multiple testing methods, each selected based on the nature of the metric being analyzed. Most of these test methods were used last year as well, as Astronaut's most valuable testing information is best derived from these methods.

The key testing methods include:

- **System Testing:** Evaluates the system as a whole to confirm seamless integration of all components.
- **Unit Testing:** Assesses individual components to ensure they function as intended.
- **Load Testing:** Measures system performance under varying levels of user demand, from normal operation to peak loads.
- **Usability Testing:** Examines overall user experience, identifying common usage patterns and potential areas for improvement.
- **Interoperability Testing:** Ensures successful data exchange in accordance with certification standards, validating proper formatting and secure transfers.
- **End-to-End Workflow Testing:** Simulates real-world clinical workflows from patient intake to discharge, ensuring that all system components function cohesively across different practice settings.

Astronaut continues to be used across multiple facilities, predominantly by independent psychiatry providers (outpatient and IOP), as well as by a select number of family practitioners and general medicine providers. This year, we expanded our real-world testing scope to include a Methadone Clinic, marking a new facility type for our system. Despite this departure from our typical user base, testing at the Methadone clinic has further substantiated Astronaut's ability to support effective and adaptable workflows. The clinic's unique requirements, such as

medication-assisted treatment (MAT) tracking and regulatory compliance, demonstrate the system's versatility.

All-in-all, we have reaffirmed Astronaut's overall reliability and usability as a Computerized Patient Record System. Nearly all of our system's functions worked as intended throughout our testing period, and we found most of our user grievances to be due to a lack of awareness on a specific feature or simply user error. Over the years we have consistently updated our User Manual with instructions on how to use the most requested features so that our users have a reference guide; we are consistently updating our guide as we become better aware of the areas our users lack education in.

One of the few difficulties we have had during testing is in regards to our third party partners, namely Keeper (our Guacamole server providers) and Newcrop (our E-Prescribing client).

When it comes to Keeper, our server was being throttled due to a predatory licensing scheme that Keeper implemented within the last testing period. To remedy this issue and ensure our system's reliability, we decided to adopt the administrative responsibilities of the server and end our working relationship with Keeper. Please note that the software itself was not changed in this process, and the server architecture we have been using (Guacamole) is still the same. The only difference is that we are managing the server in-house as opposed to being at the mercy of Keeper's staff. Now that we have direct control of our server and its maintenance we can ensure uninterrupted service to our users as well as have access to more robust options when it comes to the customization of our server behavior. This has been a huge improvement, reducing wait times for server troubleshooting and expanding our control as the system's administrators.

Our other difficulty comes with Newcrop, a third-party E-Prescribing client that has been used within Astronaut for years. Due to the third-party nature of their software, certain updates made on their end can affect the way it interacts with our software. In most cases, their updates do not affect usability and our E-Prescribing service works as intended. The only challenge we have faced with their updates is in regards to exporting the Medication information from the Newcrop client. There have been a couple instances of their updates temporarily suspending the ability to "Print" from their client. That being said, this issue was quickly identified and fixed by our IT staff at the earliest convenience. We will continue to monitor the compatibility of our clients and are committed to remedying any issues that might arise due to their unexpected updates.

Our interoperability has remained true to the criterion, as we are consistently using our FHIR server to process the CCDAs of our patients in the system. In the future, we would like to take the capability further and use the CCDA information to populate a secure patient portal that will allow patients and authorized group home managers to view necessary health information that has been entered in Astronaut by our providers. We believe this feature will be a powerful utilization of the CCDAs, allowing us not only to be interoperable as per stated in the criterion, but also to provide our patients a better experience. Astronaut's strengths are in its focus on elevating the overall quality of care, so we are dedicated to improving our offerings for the patients' of our providers as well as the providers/users themselves.

In terms of user feedback, we have received many positive responses regarding the ease of use of our system and the helpfulness of our support staff. Because our billing is handled within the system, users do not need to question whether or not the information they have entered is sufficient for billing purposes. This self-auditing feature of our system not only holds our providers accountable for the care they provide, but also ensures a standard of care that surpasses the minimum. Our staff scrutinizes the billing reports on a weekly basis, consistently contributing to the real world testing efforts throughout the testing period. Astronaut shoots for the stars, and this is reflected in our vast array of vetted templates, the fidelity of the software itself, and the assistive features that not only hold our providers to a high standard but also lessen the providers' burden on administrative guesswork.

Overall we are pleased with our findings and confident that Astronaut excels in the promise it delivers, providing a robust but user-friendly software that reduces complications through its intuitive design and results in superior care outcomes for the patients of our users.

Standards Updates (Including Standards Version Advancement Process (SVAP) And United States Core Data For Interoperability (USCDI))

Indicate as to whether optional standards, via SVAP and/or USCDI, are leveraged as part of the certification of your health IT product(s).

[**X**] Yes, I have products certified with voluntary SVAP or USCDI standards.

[] No, none of my products include these voluntary standards.

Standard (and version)	USCDI v1
Updated certification criteria and associated product	170.315 (b)(1) 170.315 (g)(9)
Health IT Module CHPL ID	15.02.05.3099.ASTR.01.00.1.220201
Conformance Measure	Transitions of Care ; (b)(1) Application Access - All Data Request ; (g)(9)

Care Setting(s)

Real World Testing was conducted within the following care settings:
Outpatient (Psychiatric, General Medicine), Intensive Outpatient (Psychiatric), Small-Scale and Independent Practices/Facilities, Inpatient Admission/Discharge, MAT Clinic (Methadone)

Metrics and Outcomes

Statistics are over the testing period which was May 2024 - August 2024.

Associated Criterion	Measurement /Metric	Relied Upon Softw are	Outcome Summary	Challenges Encountered (if applicable)	Actual Results
170.315 (b)(1) - Transitions of Care	The features are present within the system and follow the relevant certification protocols. Summaries are consistently produced with a <1% error rate. 1. Number of CCDAs created 2. Number of CCDAs sent via edge protocols 3. Number of CCDAs received via edge protocols 4. Utilization rate	N/A	The CCDAs created from patient files are successfully uploaded to our FHIR server as proposed by the criterion. The only issue we had in regards to this is an instance where we ran out of server space to store the CCDAs. Other than that, we are pleased with our generation of the care summaries, as it is in congruence with the relevant regulations in place. In terms of CCDAs being sent/received, since we had no facilities requesting/sending the CCDAs, we did test case scenarios that would closely mirror real life.	When our server ran out of space, we were able to quickly remedy the issue by purchasing extra hard drive space for our FHIR Windows Server. We do not see this issue arising again as the extra space should be sufficient for years to come.	Pass 1. 10215 2. 50 3. 50 4. N/A
170.315	Prescriptions	Newcr	Other than the rare	Any	Pass

(b)(3) - Electronic Prescribing	are sent through Newcrop and are pulled back into Astronaut for easy viewing. Prescriptions display accurately and update properly when changes are made in Newcrop's E-Prescribing system with a <1% error rate. 1) Number of prescriptions created 2) Number of prescriptions changed 3) Number of prescriptions canceled 4) Number of prescriptions renewed	op E-Prescribing	occurrence (<0.5%) of the "Print" function having issues, we have found that Newcrop has been a reliable tool to securely send medications to the pharmacies our patients prefer. In any instance, Newcrop has a "Report Failed RX" button that is available if issues do arise.	incongruences in the code due to Newcrop updates are remedied by our IT department as soon as they are identified.	1. 8376 2. 369 3. 299 4. 5811
170.315 (b)(10) - Electronic health information export	Export functionality is present and contains the data specified in the criterion. The file is configured for interoperability and is accessible based on the authorized user's needs. The exporting functionality is aimed to have an error rate of	N/A	Our export functionality had an error rate of <3%. In rare occasions, we would have a peculiar error with our server that would halt the transportation of CCDAs. However, this error was easily identified and fixed by rebooting the FHIR server. We will continue to closely monitor our CCDA output to ensure functionality.	We must continue ensuring the integrity of our FHIR server so that our CCDAs are able to be properly transported to the end point.	Pass 1. 9919

	<5%.				
170.315 (c)(1) - Clinical Quality Measures - Record and Export	Astronaut can export relevant data reliably in a format that fits with the criterion for certification. Exporting the data should be reliable and will have an error rate of <1%. 1. Rate of patients who required an exported QRDA. 2. Generating QRDAs from patient charts (Real World SImulation)	N/A	Our system continues to export patient data into QRDA format successfully with a 0% rate of error. This is due to our certification activities including using the Cypress Test Deck and validator. This helps us ensure that our QRDA format is sufficient regarding the requirements for the relevant criterion. Because we did not have any patients that required a QRDA file for their specialist, we instead carried out real world test scenarios that mirror how QRDAs would be generated in the real world.	N/A	Pass 1. N/A 2. 50
170.315 (g)(7) - Application Access - Patient Selection	Every patient created has a unique ID that can be identified in their demographics file. Because of the way the system is configured, the error rate for this should be less than or extremely close to 0.00001%. Any anomalies will be immediately identified and corrected by IT staff.	N/A	Similar to last year, our rate of error for this criterion was 0%. This is due to the way our system logs new patients. Because the IDs are created sequentially, our system inherently ensures that no two patients have the same Patient ID, and this is reflected in our FHIR server uploads. Although our FHIR server has the capability to interact with third party software, there were no requests needed during the testing period. Because of this, we carried out	N/A	N/A

			several simulations that closely mirror real-world use (See Simulation Testing Below).		
170.315 (g)(9) - Application Access - All Data Requests	The API responds to requests for patient data for all of the data categories specified in the USCDI at one time in a summary record formatted according to the C-CDA template. Patient data requests should have an error rate of <1%.	N/A	We didn't have any users that actively needed to export any PHI specifically in the CCDA format. Due to this, we did our testing using requests that would closely mirror a real-world situation (See Simulation Testing Below). The only incident of error involved trying to export a CCDA while the FHIR server was rebooting. This was remedied by waiting for the FHIR server to properly reboot before making the request.	N/A	N/A
170.315 (g)(10) - Standardized API for Patient and Population Services	Respond to requests for single or multiple patients' data according to the standards adopted in the relevant criterion. This is done through our FHIR server in conjunction with our software's CCDA generation.	N/A	There were not any third party applications that required the use of this criterion. That being said, our FHIR server has been fitted to be able to fulfill this criterion when the time comes. As of now, it seems that the interoperable nature of our software has not been fully utilized by our clients and business partners. (See Simulation Testing Below).	N/A	N/A
170.315 (h)(1) - Direct Project	The health IT can electronically transmit (send	Newcrop E-Prescribing	Our software should be successfully able to transmit health information when	N/A	N/A

	and receive) health information to a 3rd party in the proper format and following the criteria required for certification. Transmitting this data is aimed to have an error rate of <1%.		asked by a 3rd party in the proper format without any errors. We tested this using simulated situations that closely resemble what would happen in the real world (See Simulation Testing Below).		

Simulation Testing

Due to the low adoption rate of some of the criteria we have had to do some simulation testing that closely mirrors real-world use. The details of our simulation testing efforts are below.

170.315(g)(7) Application Access — Patient Selection:
An authorized user uses an internal API testing tool to send a request containing a test patient's demographic details. The API processes the request, verifies the patient, and returns a unique patient ID or token. The appropriate ID is used to make a follow-up request for the patient's medical data, which was successfully retrieved. API documentation is reviewed to ensure it includes syntax, function names, parameters, data structures, and error-handling methods. In addition, an audit log confirms the transaction was processed correctly and securely.

170.315(g)(9) Application Access – All Data Request:
An authorized user uses the internal API testing tool to request a full patient data export. The system verifies permissions, retrieves the test patient's complete record in FHIR (CCDA) format, and displays it for review. The authorized user checks that the data is structured correctly, and an audit log confirms the request was completed without issues.

170.315(g)(10) Standardized API for Patient and Population Services:
An authorized user runs a population health report, simulating an API request for public health data. The system extracts de-identified statistics for a test condition. We decided to use the schizophrenia diagnosis as our test condition. Next, a report is generated showing patient counts and trends. The data format is reviewed for accuracy, and an audit log confirms the process was executed correctly.

170.315(h)(1) Direct Project:

An authorized user composes a secure referral message and sends it to an internal test account using the Direct Messaging / Notification feature. Next, the user logs into the recipient test account to verify receipt of the encrypted message. The system confirms the message was successfully sent, received, and logged, ensuring compliance with secure messaging standards.

Key Milestones

Key Milestone	Care Setting	Date/Timeframe
Gather data regarding testing activities through the use of collected metrics, reporting tools, and user feedback	Outpatient, IOP, Small-Scale and Independent Practices/Facilities, Inpatient Admission/Discharge, MIT Clinic (methadone)	May 2024 - August 2024
Review collected data, ensuring our metrics cover the criteria in question	Outpatient, IOP, Small-Scale and Independent Practices/Facilities, Inpatient Admission/Discharge, MIT Clinic (Methadone)	September 2024 - November 2024
Analyze data and write the Real World Testing Results Report for submission	Outpatient, IOP, Small-Scale and Independent Practices/Facilities, Inpatient Admission/Discharge, MIT Clinic (Methadone)	December 2024 - January 2025