eLTSS Testing at HL7 Connectathon 25

Initial Report Out
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Purpose of eLTSS Testing

• Implement and test the eLTSS FHIR IG within a variety of independently developed systems

• Integrate the eLTSS IG with a production case management system and share data from that system with an independent server

• Utilize the eLTSS IG in conjunction with other FHIR IGs to support the aggregation of data

• Exchange eLTSS care plans among disparate health IT (HIT) systems and clients, and display care plans in a consumable format for care providers, beneficiaries, and family members

• Dynamically update eLTSS Care Plan data and share that update among systems
PACIO-eLTSS Use Case

**Scene 1: Home with LTSS**
Day 1 (7/6/20): Betsy is at home receiving LTSS. SW assesses her and documents Care Plan. Goals into the CM EHR on 7/6/2020 at 1500. Betsy is functioning independently without the use of assistive devices.
Day 2 (7/7/20): Betsy experiences an acute onset of right-sided weakness (with dizziness), facial palsy (partial paralysis of lower face), blurring vision with mild aphasia and dysarthria. She calls 911 for help and an ambulance transports her to the hospital.

**Scene 2: Hospital**
Day 2 (7/7/20): Hospital admits Betsy at 1600. Upon assessment by the Neurologist, Betsy is found to have an occlusion of the L MCA. MD documents ischemic stroke and a list of current medications on 7/7/20 at 1532. The care team decides to follow conservative management, since too much time has elapsed to effectively administer TPA.
Day 3 (7/8/20): PAC assessments are pulled from Pseudo DEL for PT and OT to complete (1) functional assessments at 1600 and (2) SLP to complete MMSE and MoCA 1732.
Day 4 (7/9/20): Betsy’s condition significantly worsens resulting in complete right-sided paralysis, worsening dysarthria and dysphasia. The care team decides to perform a mechanical thrombectomy. Betsy’s condition improves after the thrombectomy with right-sided weakness improving as well as the dysarthria and dysphasia.
Day 6 (7/10/20): PAC assessments are pulled from Pseudo DEL for (1) SLP to complete MoCA and MMSE at 1216 and (2) functional assessments at 1414. PT, OT and SLP recommend rehab in a SNF.
Day 7 (7/11/20): MD updates medication list on day of discharge at 7/11/20 0542 by MD. Hospital discharges Betsy to SNF soon after.

**Scene 3: SNF**
Day 7 (7/11/20): SNF admits Betsy to the SNF at 1130. PT/OT/LP complete a medication review and assessments (Nursing Comprehensive on the MDG) by 1632.
Day 8 (7/12/20): OT completes assessments (Nursing Comprehensive on the MDG) at 1115
Day 9-26 (7/13/20-7/30/20): During the SNF admission, Betsy’s condition continues to improve.
Day 27 (8/1/20): PT/SLP complete the MD discharge assessment, which shows improvement in function and cognition. However, Betsy requires home health services and a continuation of her home and community based services as she returns to her baseline function/cognition. SNF discharges Betsy to home.

**Scene 4: Home with HHA**
Day 27 (8/1/20): Betsy is now at home receiving both HHA and HCES. The HHA admission nurse is able to view the patients transition summary to inform patients care and set therapy goals.
Day 28 (8/2/20): PT assesses Betsy and completes the admission OASIS assessment (includes FAS Q information).

**Scene 5: Patient and Family Access**
Day 1-28: Betsy shares her medical record with her adult son and daughter who are able to view her information at any point. Additionally Betsy is able to use the mobile app to inform her daily activities.
PACIO-eLTSS Track Testing Architecture
Ms. Betsy Smith Johnson receives home community-based services (HCBS) services at home. A social worker documents eLTSS data, including care plan and goals in FEI’s Blue Compass Mississippi system.
Scene 1 FEI Blue Compass Data Transmission Using the eLTSS IG

- FEI pushed Betsy’s eLTSS care plan through their FHIR façade infrastructure

Internal systems can also utilize the FHIR services to connect with each other e.g. WITS querying LTSS data or vice versa
Scene 1 Data from a case management system is received by a FHIR server

Betsy’s care plan bundle is posted on Altarum's Care Coordinator Server
Scene 1 The transferred care plan can now be viewed on the FHIR server

Altarum’s portal displays the care plan sent by FEI Systems
Scene 1 A data transfer tool is used to move a complete eLTSS data collection to another server

Altarum’s eLTSS data tool was used to efficiently move a complete collection of eLTSS data to Patient Centric Solutions’ data hub
Scene 2 Clinical and assessment data are aggregated with eLTSS data in the data hub

Betsy’s clinical data was imported to the data hub from a pseudo HIE, and her assessment data was added from the MITRE PAC assessment app. This data was successfully aggregated with the eLTSS data on the hub and displayed in Patient Centric Solutions Transitions of Care app.
Scene 3 A client displays the care plan

Betsy is admitted to the SNF. From the SNF, a clinician used the Transitions of Care client, by Patient Centric Solutions, to access both clinical data and the eLTSS care plan from the hub to inform care.
Scene 3 A separate server receives both eLTSS and PACIO data from a data hub

The Altarum data tool is used to pull both the eLTSS and PACIO data from the Data Manager to a SNF server to inform her care
Scene 3 eLTSS data is moved into and displayed by a care coordinator app

Betsy’s data was pulled into and displayed by MITRE’s SNF Care Coordinator application
Scene 3 eLTSS data is dynamically updated using a care coordinator app

A goal was added to Betsy’s care plan using MITRE’s SNF Care Coordinator app
Scene 3 eLTSS update is pushed from an app into the SNF server

Betsy’s new goal was shared with Altarum’s eLTSS+PACIO SNF FHIR server
Scene 3 eLTSS update pushed from the SNF server to the data hub

Betsy’s new goal was pushed to the Patient Centric Solutions data hub and displayed in the PatientShare app
Scene 4 eLTSS data is pushed from data hub to an HHA application

Betsy returns home from the SNF and receives HHA and HCBS care. Her care plan is forwarded to the HHA

![HHA Pseudo EHR](image-url)
Scene 5 The care plan is displayed in a patient facing application

Betsy and her son Charles were able to view her care plan using Patient Centric Solutions PatientShare application
Outcomes

- eLTSS data stored in FEI System’s Blue Compass Mississippi system was pushed through a FHIR façade and received in Altarum's eLTSS Care Coordinator server. The case management system used in this demonstration is a development version of a production system used by the state of Mississippi.

- The eLTSS care plan was displayed in a reader-friendly manner in Altarum’s FHIR VUHR client.

- eLTSS data was effectively and rapidly “pushed” from Altarum’s eLTSS server to a Patient Centric Solutions data hub using Altarum's FHIR Broker Tool. This tool supported the efficient delivery of a complete eLTSS dataset of 35 resources.

- eLTSS data was aggregated with clinical data imported from a pseudo HIE into the hub effectively combining clinical and non-clinical data within a single server.

- eLTSS data was aggregated with PACIO functional and cognitive assessment data within the hub, representing the successful integration of three different FHIR IGs.

- At the SNF, the clinician used the Transitions of Care client, by Patient Centric Solutions, to access both clinical data and the eLTSS care plan from the hub to inform care.
Outcomes

• eLTSS and PACIO data, were efficiently “pulled” from the data hub into Altarum's eLTSS+PACIO SNF FHIR server. This server also demonstrated the successful integration of three separate IGs

• eLTSS care plan was pulled into MITRE’s Care Coordinator application, displayed in that application, and dynamically updated using that application. The update was then pushed to Altarum's eLTSS+PACIO SNF FHIR server, and from there it was pushed to the data hub.

• eLTSS care plan was pulled from the data hub to MITRE’s HHA EHR system and displayed

• SMART on FHIR clients and authentication requirements were utilized in the display of eLTSS data

• Demonstrated eLTSS and PACIO data moving from numerous systems across facilities using the FHIR API for both read and write scenarios

• The patient and her family caregivers were able to access her data as she moved across the continuum of care.
Lessons Learned

• Working with real world systems provides real world challenges such as patient matching, reconciling different approaches to storing and sharing data using FHIR, and recognizing that systems may not support the complete set of data specified in an IG

• Relying on FHIR’s $everything operation to share care plan data has some limitations. This operation can only capture resources that have direct references to the patient resource. Additionally, by pulling all information related to a patient, this operation could result in the sharing of extraneous information. Finally, some FHIR servers may not have activated support for operation.

• In a production environment, application functionality certification will be critical to maintain accurate data

• Data can be effectively shared using the FHIR API. Customized data transfer tools, such as the one developed and demonstrated by Altarum at this event, can also facilitate the exchange of comprehensive care plans.
Acknowledgements

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