HL7 FHIR Connectathon
September 9-10, 2023
Phoenix, AZ

Helios Align and Optimize Track
Kick Off Call

Grace Yang, Mark Roberts, Craig Newman, and Frank McKinney
August 28, 2023
Track Kick Off Agenda

- Introduction to Track Leads
- Track Logistics
- Track Touchpoint Calls
- Timeline of Activities
- Helios Overview and Track Description
- Track Purpose and Goals
- Participants Roles and Preparation
- Testing Scenarios
- Participant Checklist
- Questions
34th HL7 FHIR Connectathon

<table>
<thead>
<tr>
<th>Connectathon</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Saturday, September 9</td>
<td>9:00am to 5:00pm MT</td>
</tr>
<tr>
<td>Sunday, September 10</td>
<td>9:00am to 5:00pm MT</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Breakout Session</th>
<th>Time</th>
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</thead>
<tbody>
<tr>
<td>Saturday, September 9</td>
<td>4:00 to 5:00pm MT</td>
</tr>
<tr>
<td>Sunday, September 10</td>
<td>3:00 to 4:00pm MT</td>
</tr>
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</table>

<table>
<thead>
<tr>
<th>Education Session</th>
<th></th>
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<tbody>
<tr>
<td>Birds of a Feather Tuesday, September 12</td>
<td>5:30pm MT</td>
</tr>
</tbody>
</table>

Location
Sheraton Phoenix Downtown
Mark Roberts
Manager, Leavitt Partners
Lead, CARIN Alliance
mark.Roberts@leavittpartners.com
Zulip: @markroberts

Craig Newman, PhD
Interoperability Standards Analyst, Altarum
Program Manager, Helios
Craig.Newman@altarum.org

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Associate, Leavitt Partners
Program Manager, Helios
Grace.Yang@leavittpartners.com

Frank McKinney
Healthcare systems Consultant,
Point of Care Partners
Frank.McKinney@pocp.com
Track Logistics

Track Page
https://confluence.hl7.org/pages/viewpage.action?pageId=175606977

Helios Zulip for Connectathon Testing
https://chat.fhir.org/#narrow/stream/307807-Helios-Accelerator/topic/Align.20and.20Optimize.20Testing

Helios General Zulip
https://chat.fhir.org/#narrow/stream/307807-Helios-Accelerator

Helios Align and Optimize Zulip
https://chat.fhir.org/#narrow/stream/307807-Helios-Accelerator/topic/Align.20and.20Optimize.20Call
Track Touchpoints

Testers should join the two touchpoint calls to coordinate testing objectives.

Touchpoint Call #1: Friday, September 1st 2-3pm ET

- Zoom
  Link: https://leavittpartners.zoom.us/j/91235344798?pwd=Q1VkJWZwZndwWFpSGVT
  QMzc3hkZz09
- Password: 397657

Touchpoint Call #2: Wednesday, September 6th 3-4pm ET

- Zoom
  Link: https://leavittpartners.zoom.us/j/95966330746?pwd=cmhLU25DaFJIGUDJMWNB
  ZZ1lyNEhldz09
- Password: 378457
## Timeline of Activities

<table>
<thead>
<tr>
<th>Date</th>
<th>Time</th>
<th>Session</th>
</tr>
</thead>
<tbody>
<tr>
<td>Saturday, September 9</td>
<td>9:00 – 9:30am</td>
<td>HL7 FHIR Connectathon Kick-Off</td>
</tr>
<tr>
<td></td>
<td>9:30 – 10:30am</td>
<td>Helios Align and Optimize Data Kick-Off &amp; Testing (Add FHIR Server URLs to Zulip)</td>
</tr>
<tr>
<td></td>
<td>10:30 – 10:45am</td>
<td><strong>Break for Morning Coffee</strong></td>
</tr>
<tr>
<td></td>
<td>10:45am – 12:00pm</td>
<td>Continue Testing</td>
</tr>
<tr>
<td></td>
<td>12:00 – 12:45pm</td>
<td><strong>Lunch</strong></td>
</tr>
<tr>
<td></td>
<td>12:45 – 3:00pm</td>
<td>Continue Testing</td>
</tr>
<tr>
<td></td>
<td>3:00 – 3:30pm</td>
<td><strong>Cookie Break</strong></td>
</tr>
<tr>
<td></td>
<td>4:00 – 5:00pm</td>
<td>Breakout Session</td>
</tr>
</tbody>
</table>
## Timeline of Activities (Cont.)

<table>
<thead>
<tr>
<th>Date</th>
<th>Time</th>
<th>Session</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sunday, September 10</td>
<td>9:00 – 9:45am</td>
<td>Level Set Saturday’s Activity &amp; Testing</td>
</tr>
<tr>
<td></td>
<td>9:45 – 10:00am</td>
<td>Break for Morning Coffee</td>
</tr>
<tr>
<td></td>
<td>10:00 – 12:00pm</td>
<td>Testing</td>
</tr>
<tr>
<td></td>
<td>12:00 – 1:00pm</td>
<td>Lunch</td>
</tr>
<tr>
<td></td>
<td>1:00 – 3:30pm</td>
<td>Gather and Develop Report-Out Documentation</td>
</tr>
<tr>
<td></td>
<td>3:00 – 3:30pm</td>
<td>Cookie Break</td>
</tr>
<tr>
<td></td>
<td>3:00 – 4:00pm</td>
<td>Breakout Session</td>
</tr>
<tr>
<td></td>
<td>3:30 – 5:00pm</td>
<td>HL7 FHIR Connectathon Closing &amp; Report-Out</td>
</tr>
</tbody>
</table>
• The Helios FHIR Accelerator is a public/private partnership between the CDC, CDC Foundation, ONC, the STLT public health community, and private sector partners focused on advancing HL7® FHIR® APIs in public health. One of the workgroups is looking at ways to ‘Align and Optimize’ HL7® FHIR® APIs for public health use cases.

• The Helios Align and Optimize workgroup identified three use cases scenarios to test at the Connectathon using FHIR Query and Response applicable to public health investigations.
  — Obtain Demographic and Contact Information
  — Query for Supplemental Information: Newborn Screening
  — Query for Supplemental Information: Positive Reportable Condition (e.g., sexually transmitted infections)
Track Goals

• The track focuses on testing a generic query/response workflow for three use cases applicable to public health investigations.
• Advance the Mapping Public Health Use Cases to FHIR Technical Guidance
• Test the use of USCDI-based FHIR APIs for Public Health Data access
System Roles

Public Health Agency (PHA) Server

- PHA user queries to identify patient in EHR system, retrieve additional demographic and contact information
- PHA user queries for additional information based on the received report and applicable use case
- Bonus: Queried info integrated back into PHA technology
- Notes:
  - Queries and responses utilize USCDI data elements (V1 required, V3 potential) per US Core guidance, where possible
  - [https://inferno.healthit.gov/suites/us_core_v600/qjIf6skZyo](https://inferno.healthit.gov/suites/us_core_v600/qjIf6skZyo)

EHR System

Responds to PHA query
- With patient match response with patient resource
- With requested information
- With negative response
- Note: Can use Inferno to support: [https://inferno.healthit.gov/](https://inferno.healthit.gov/)
Prerequisites: Oracle Cerner Sandbox (Provider or System Access App)

The following information applies to provider and system access app developers connecting with *Cerner Ignite APIs℠* for *Millennium* and *Cerner Ignite APIs for Soarian Clinicals*.

- Review [Open Developer Experience Terms of Use](#)
- Review our [API Access Agreement](#)
- Review our [Cerner Millennium℠](#) and/or [Soarian Clinicals](#) documentation, including the list of available FHIR API resources, and document a gap analysis for your app
- Review our [FAQs page](#) to understand the process and all technical, security and validation requirements
- Register your application in [Open Developer Experience code Console](#)
- Develop a working app demo, connecting with the [Open Developer Experience open sandbox](#) or [Soarian Clinicals sandbox](#).
## Participant Roles and Preparation

<table>
<thead>
<tr>
<th>Organization</th>
<th>Actor</th>
<th>Role</th>
<th>Tools</th>
<th>Responsible Person</th>
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<tr>
<td>Altarum</td>
<td>Track Leads</td>
<td></td>
<td></td>
<td>Craig Newman</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Forrest White</td>
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<tr>
<td>CDC</td>
<td>PHA - Government</td>
<td>Data Receiver</td>
<td>FHIR Client, Postman</td>
<td>Cosmin Potocean</td>
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<td></td>
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<td></td>
<td>Saugat Karki</td>
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<tr>
<td>Epic</td>
<td>Healthcare</td>
<td>Data Submitter</td>
<td>FHIR Server &amp; Test Data</td>
<td>Cooper Thompson</td>
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<tr>
<td>Intelligent Medical Objects</td>
<td>Observer</td>
<td></td>
<td></td>
<td>Lou Ann Montgomery</td>
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<tr>
<td>Leavitt Partners</td>
<td>Track Leads</td>
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<td>Grace Yang</td>
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<td>Mark Roberts</td>
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<td>MITRE</td>
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<td>FHIR Server</td>
<td>Dave Hill</td>
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<td>ONC</td>
<td>Observer</td>
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<td>Katie Tully</td>
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<td>Oracle Cerner</td>
<td>Healthcare</td>
<td>Data Submitter</td>
<td>FHIR Server &amp; Test Data</td>
<td>Hans Buitendijk</td>
</tr>
<tr>
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<td></td>
<td>Steve Hill</td>
</tr>
<tr>
<td>Point of Care Partners</td>
<td>PHA</td>
<td>Data Submitter</td>
<td>FHIR Server</td>
<td>Frank McKinney</td>
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<tr>
<td>Skylight</td>
<td>PHA</td>
<td>Data Submitter</td>
<td>FHIR Server</td>
<td>Brady Fausett</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Daniel Paseltiner</td>
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PH Query and Response Process Flow

Precondition: Information reported to PHA through ELR, eICR, or other report (CDA, FHIR, or v2)

Workflow 1: Patient Match and Obtain Demographic and Contact Information
- Scenario 1: Patient $match
- Scenario 2: FHIR search
- Scenario 3: Patient $match or FHIR Search with multiple matches

Workflow 2: Query for Supplemental Information
- Scenario 1: Newborn Screening
- Scenario 2: Positive Result Follow-up

Reportable Result: v2 message (ELR), CDA (eICR), FHIR

Scenario 1: Demographics
Scenario 2: MRN, Demographics

Patient Resource(s)

FHIR search for screening info captured shortly after birth
Observations matching requested values

FHIR search for clinical information related to a case, using specific codes and other parameter values

Many elements (incl. MedicAdministered, Pregnancy Status, Additional Demographics, follow-up lab test)
Obtain Demographic and Contact Information

**Scenario 1:** As part of a case investigation, a public health practitioner locates an individual in their provider’s EHR using the Patient $match operation

- **Action:** The investigator submits a Patient $match request to the EHR, using demographics received in a reportable lab or condition report

- **Preconditions:**
  - The public health entity has received notice of a reportable event through an electronic lab report or other means
  - The investigator has determined which EHR system to access (based on provider information in the received report)
  - The public health system has authorization to query the EHR for patient information (a data sharing agreement is in place between the PH entity and the healthcare organization)
  - The investigator can provide enough demographic information to enable the EHR to match the patient

**Success Criteria:** The EHR positively matches the individual, returning a single Patient resource in the match response
Obtain Demographic and Contact Information (Cont.)

**Scenario 2:** The investigator performs a FHIR search for the patient in the EHR
- **Action:** The investigator submits a FHIR search for the patient in the EHR using parameters such as the individual’s medical record number, name and date of birth
- **Preconditions:** Same as in Scenario 1
- **Success Criteria:** The FHIR search returns a single Patient resource corresponding to the search parameters

**Scenario 3 (Alternative response to both Scenarios 1 and 2):** The EHR returns multiple patients in response to the investigator’s action (either Patient $match or FHIR search)
- **Action:** The investigator submits a Patient $match or FHIR search for the patient in the EHR (per Scenario 1 or 2 above)
- **Preconditions:** Same as in Scenario 1
- **Success Criteria:** The FHIR search returns multiple Patient resources corresponding to the submitted demographics, and the investigator determines which is correct
Obtain Demographic and Contact Information (Cont.)

Discussion Scenario:

If the investigator can’t positively match the patient in the EHR based on available demographic information, are there fallback approaches that could be tried? For example, navigate to the patient based on lab order information received by the public health agency in a lab report?
Query for Supplemental Information: Newborn Screening

Note: All query workflow scenarios require successful completion of the Match Patient and Obtain Demographic and Contact Information workflow, above, so that the individual's Patient.id can be included in FHIR searches.

Scenario 1: Newborn Screening

- An investigator at a Newborn Screening (NBS) program queries the birthing facility’s EHR for a particular newborn’s screening information
- **Action**: The investigator submits FHIR Observation searches to the EHR for screening information captured shortly after the time of birth
- **Preconditions**:
  - The Newborn Screening (NBS) program has become aware of an infant born at a FHIR-accessible birthing facility, through an electronic notification or other means
  - The NBS has authorization to query the EHR for patient clinical information (a data sharing agreement is in place between the NBS and the healthcare organization)
  - The investigator or their system knows the LOINC codes associated with the desired screening information (see query content, below)
- **Success Criteria**: The EHR returns FHIR resources containing the desired information. (see “Sample Query Content”)

Sample Query Content

```
GET /Patient
?patientId={Patient.id}

[Patient: {
  "identifiers": [{"system": "urn:oid:2.16.840.1.113733.2.164704.3.1.7.1", "value": "{Patient.id}"}],
  "gender": "{Patient.gender}",
  "birthDate": "{Patient.birthDate}",
  "name": [{"family": "{Patient.familyName}", "given": "{Patient.givenName}"}],
  "address": [{"type": "home", "line1": "{Patient.line1}", "city": "{Patient.city}", "state": "{Patient.state}", "postalCode": "{Patient.postalCode}"}],
  "telecom": [{"system": "tel", "value": "{Patient.phone}"}],
  "note": [{"text": "{Patient.note}"}],
  "maritalStatus": "{Patient.maritalStatus}",
  "race": "{Patient.race}",
  "ethnicity": "{Patient.ethnicity}"}
```

```
GET /Observation
?patientId={Patient.id}
&code={ScreeningCode}

[Observation: {
  "status": "final",
  "valueCodeableConcept": {
    "coding": [{"system": "loinc", "code": {ScreeningCode}}],
    "value": "{ScreeningValue}"},
  "effectiveDateTime": "{ScreeningDate}"}
```
Sample Query Content – Newborn Screening (Preliminary)

<table>
<thead>
<tr>
<th>Information sought</th>
<th>FHIR resource</th>
<th>FHIR search or other method</th>
</tr>
</thead>
<tbody>
<tr>
<td>The basic Observation types that may be available from the EHR are:</td>
<td>Observation</td>
<td>GET [base]/Observation?patient={patient}&amp;subject={subject}&amp;category={category}&amp;code={code}&amp;date={date}</td>
</tr>
<tr>
<td>• CCHD Newborn Screening Interpretation: 73700-7</td>
<td></td>
<td>where:</td>
</tr>
<tr>
<td>• Reason CCHD oxygen saturation screening not performed: 73698-3</td>
<td></td>
<td>• category = vital-signs <em>(depending on the EHR… to be tested)</em></td>
</tr>
<tr>
<td>• Newborn hearing screen of ear – left: 54108-6</td>
<td></td>
<td>• code = [LOINC codes noted in the Information Needed column]</td>
</tr>
<tr>
<td>• Newborn hearing screen of ear – right: 54109-4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Hearing loss risk indicators (if possible): 58232-0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Hearing loss newborn screening comment/discussion (if possible): 57700-7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Newborn hearing screen reason not performed of ear – left: 73739-5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Newborn hearing screen reason not performed of ear – right: 73742-9</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Sample Query Content – Newborn Screening (Preliminary)**
Query for Supplemental Information: Positive Reportable Condition (STI)

When investigating a case of a reportable condition (an STI), a public health practitioner retrieves pertinent clinical information from an EHR

• **Action**: The investigator submits FHIR searches to the EHR for particular clinical information related to the case, using specific codes and other parameter values

• **Preconditions**:
  • The public health system has authorization to query the EHR for patient clinical information (a data sharing agreement is in place between the PH entity and the healthcare organization)
  • The investigator has located the subject’s patient record in the EHR
  • The investigator or their system knows the lab LOINC codes, medication identifiers, etc. needed to query for the specific information needed (see query content, below)

• **Success Criteria**: The EHR returns FHIR resources containing the desired information. (see “Sample Query Content”)
**Sample Query Content: Positive Reportable Condition (STI) (Preliminary)**

<table>
<thead>
<tr>
<th>Information needed</th>
<th>FHIR resource</th>
<th>FHIR search or other method</th>
</tr>
</thead>
</table>
| Provider who ordered the syphilis test, located using the following LOINC codes:   | Practitioner                                                                 | • 1<sup>st</sup>: Locate the lab panel (FHIR DiagnosticReport) of interest. See #3 in [US Core DiagnosticReport required searches](https://www.hl7.org/fhir/us/core/2018-03/DiagnosticReport.html), E.g.,  
  GET [base]/DiagnosticReport?patient=123  
  &code=http://loinc.org/LOINC 98212-4  
  • 2<sup>nd</sup>: Retrieve the associated ServiceRequest referenced in the returned DiagnosticReport.basedOn element  
  • 3<sup>rd</sup>: Retrieve the associated Practitioner referenced in ServiceRequest.requester  
  • Discuss: What is the most reliable and efficient way to determine the ordering provider based on current EHR population of ServiceRequest, DiagnosticReport and Observation? |
| • Rapid plasma reagin (RPR) (LOINC LP70657-9)                                      | Practitioner referenced in the .requester element of the ServiceRequest referenced in DiagnosticReport.basedOn |                                                                                                           |
| • Reagin Ab and Treponema pallidum IgG and IgM and total panel – Serum (LOINC 98212-4) |                                                                                   |                                                                                                           |
### Sample Query Content: Positive Reportable Condition (STI) (Cont.)

<table>
<thead>
<tr>
<th>Information needed</th>
<th>FHIR resource</th>
<th>FHIR search or other method</th>
</tr>
</thead>
</table>
| USCDI v3 defined social determinants of health | Observation where .category =  
  - **code**: sdoh | Retrieve all patient Observations with a .category of 'survey'.  
  - GET [base]/Observation?patient=12345  
  &category=[http://loinc.org|survey](http://loinc.org|survey)  

  *Discuss: SDOH population and LOINCs used in EHRs today*

  - Example results:  
    - Employment status – current (LOINC 67875-5)  
    - Housing status (LOINC#71802-3)

  &code=[http://loinc.org|82810-3](http://loinc.org|82810-3) |
<table>
<thead>
<tr>
<th>Information needed</th>
<th>FHIR resource</th>
<th>FHIR search or other method</th>
</tr>
</thead>
</table>
| Medication prescribed / administered    | MedicationRequest MedicationAdministration | GET [base]/MedicationRequest?patient=123
|                                         |                              | GET [base]/MedicationAdministration?patient=123               |
| Other treatment information             | TBD                           |                                                                  |
| Patient demographic information         | Patient                      | Patient/$match operation or patient search returning general demographics and:
| Phone numbers                           |                              | · Phone (Patient.telecom, system='phone')                       |
| Race / ethnicity                        |                              | · Race (Patient.extension = us-core-race)                        |
|                                         |                              | · Ethnicity (Patient.extension = us-core-ethnicity)              |
|                                         |                              | See the Demographic and Contact Information use case            |
Participant Checklist

✔ Register on HL7 Event Page
✔ Sign up for Confluence Access
✔ Sign up for chat.fhir.org Access (Zulip)
✔ Get the Whova App
✔ Complete Pre – Connectathon Survey and select Track
  ✔ From email or quick links on confluence
✔ Connect with your Track lead & participants
✔ Watch HL7 Connectathon Participant Information Session Recording
✔ Join Track Touchpoint Calls
Questions?

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Frank McKinney
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