Argonaut 2020 Patient Lists

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Who am I?

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• During DevDays, you can find / reach me here:
  • Via Whova App – Speaker’s Gallery
• FHIR Zulip Chat
Argonaut Patient Lists

- Scope
- Background
- Sketch of API
- Implementation Experience
- Demo
- Roadmap
- Next Steps
- Resources
Argonaut Patient List Project Scope

**GOAL**: Support interoperable and standard exchange using the FHIR API for exposing *existing* EHR user-facing patient lists

- “System Generated” Lists (e.g., Calendar for the day showing patients)
- “User Generated” Lists (e.g., Patients I want to follow up on)
- Write is Out of Scope
- Final Work Product will be an implementation Guide
Background

• **User-facing apps often need to know things like:**
  • “Who are the patients I’m seeing today,”
  • “Who are the patients I’m responsible for in the hospital right now,”
  • “Who are the patients in this ward.”

• **This core functionality is already supported by EHR systems**

• **However no standards based guidance for creation of and manipulation of patient lists currently exists.**

• **Several Options:**
  • Search
  • Assemble Patients in List Resource
  • Assemble Patients in Group Resource
Sketch of API

Patient List Uses the FHIR Group Resource

1. Discovery of ‘User Facing’ Lists
2. Fetch Patient List
3. Fetch Additional Data about each Patient
REMEMBER

For Patient List Think **Group Resource**

For our use case, Group lists members (``actual`` = true) and members reference Patients using their logical FHIR ids.
FHIR Group Resource

UML Diagram (Legend)

Group (DomainResource)
- identifier : Identifier [0..*]
- active : boolean [0..1]
- type : code [1..1] « GroupType! »
- actual : boolean [1..1]
- code : CodeableConcept [0..1]
- name : string [0..1]
- quantity : unsignedInt [0..1]
- managingEntity : Reference [0..1] « Organization|RelatedPerson|Practitioner|PractitionerRole »

Characteristic
- code : CodeableConcept [1..1]
- value[x] : Type [1..1] « CodeableConcept|boolean|Quantity|Range|Reference »
- exclude : boolean [1..1]
- period : Period [0..1]

Member
- entity : Reference [1..1] « Patient|Practitioner|PractitionerRole|Device|Medication|Substance|Group »
- period : Period [0..1]
- inactive : boolean [0..1]
1. Discovery

- Use Group Resource
- Ability to Search by characteristic
  - Location
  - Practitioner
  - Organization
  - CareTeam
- Ability to Search by manager of List
- Use Summary Search to limit payload size
Example Search Syntax for Getting all the available Patient Lists

```
`GET Group?_summary=true&type=person&
    characteristic=[Code value]&
value-reference=[Value value]
```

* value-reference is a custom SearchParameter in FHIR R4 added to FHIR R5
2. Fetch Individual Patient List

- Patient list is selected using a simple Fetch operation:
  
  /Group/[id]

  End User gets the list of Members
Are We Done?....

... Maybe, but typically need more data about the patient
3. Fetch Additional Data about each Patient

- The Simplest approach is to do a series of queries on the Server to fetch additional data...
Example Search Syntax for Getting data about the members in a Patient List

for each patient in Group:

GET Patient/ID

GET Observation/$lastn?patient=Patient/ID&category=laboratory
When a Patient Based Query Fails

- Sometimes a patient based query isn’t going to get you what you want...

3. Fetch Additional Data: Client MAY fetch more data using a series of FHIR API Searches

Returns requested data
Get the Specific Encounter or Appointment that defines the Group Membership

A patient-based search on Encounter or Appointment may not give you only the one you are interested in

Group

0..* Group.members

Group.member.extension to reference the specific Encounter or Appointment which define the group membership:
   For example, the appointment for each patient I am seeing today.
Fetching Additional Data Using Questionnaire

Group

Group.extension that references a Questionnaire form defining the data that is provided for each patient (Group.member)

0..* Group.members

Group.member.extension that references the filled out form (QuestionnaireResponse) supplying the patient data defined by the Questionnaire (filled by server not the patient)
Using the Questionnaire Extension - Remote Monitoring

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Using the Questionnaire Extension - Remote Monitoring

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Using the Questionnaire Extension - Remote Monitoring

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<thead>
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<th>Risk score</th>
<th>Change since last review</th>
<th>Last reviewed</th>
<th>Name</th>
<th>Age</th>
<th>Sex</th>
<th>Problem</th>
<th>SOFA (or other scores)</th>
<th>Vitals</th>
<th>Alerts</th>
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<td>15m ago</td>
<td>G. Atwood</td>
<td>45y</td>
<td>M</td>
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<td>+100</td>
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<td>52y</td>
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<td>Angina</td>
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<td>Kidney Failure</td>
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</table>

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Implementation Experience

HL7 Connectathon 25: Sept 10th,11th

Servers: Cerner, Meditech, Microsoft,
Clients: Apple, Epic, Microsoft, Argonaut Test App

Accomplishments:

• Able to demonstrate basic proof of concept for above workflow for both Clients and Servers
• Identified Several Issues
Live Demonstration

The Argo Patient List client application will cover some foundational, early-design operations such as list discovery, selecting list member records, and selection of 'extra'
# Argonaut Patient List Roadmap

<table>
<thead>
<tr>
<th>Month</th>
<th>Task</th>
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</thead>
<tbody>
<tr>
<td>April</td>
<td>Kickoff</td>
</tr>
<tr>
<td>May-June</td>
<td>Define Scope and API Design</td>
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<tr>
<td>July - August</td>
<td>Draft and Iterate on IG and prototype implementations</td>
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<tr>
<td>September</td>
<td>Connectathon Track - test multiple servers and clients</td>
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<tr>
<td>October - December</td>
<td>Iterate on IG and prototype implementations</td>
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<tr>
<td>January 2021</td>
<td>???: Ballot IG</td>
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<tr>
<td></td>
<td>Connectathon Track - test multiple servers and clients</td>
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Next Steps

- HL7 FHIR January Connectathon
  - More Testing Capacity
  - Focus on getting additional Data using Q/QR
  - Large Lists
  - Getting Encounters and Appts that defined membership on the list

- Publish Argonaut Implementation Guide
- After more implementation experience hand off to HL7 for publishing as an HL7 IG.
Argonaut Patient List Resources

- Patients lists Wednesday 1-2 PM EDT (Next Meeting ...)
  Running meeting notes
- Draft API (sequence diagrams, FHIR artifacts)
- 2020-09 Patient Lists Connectthon 25 Summary
- Codelab exercise: https://aka.ms/patient-lists-codelab
- Argo Patient Lists Test App