FHIR Server for Azure

https://github.com/Microsoft/fhir-server
Open. Extensible. Easy to deploy.
Check it out and contribute!
aka.ms/fhirserver-azurefree

Try out the Microsoft Teams toolkit
aka.ms/teamshealthcasedocs

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© Health Level Seven, HL7, CDA, FHIR and the FHIR [FLAME DESIGN] are registered trademarks of Health Level Seven International, registered in the US Patent and Trademark Office.
Dear HL7®FHIR®DevDays participant and FHIR community member,

Welcome to the seventh edition of DevDays. This is the first edition of DevDays since the release of R4, the first FHIR version with normative content. Somewhat sadly, I realize that FHIR has grown out of its infancy. It is now the young adult that just left home – the HL7 community – to explore and conquer the wide world of health IT. We started climbing the mountain “Interop” back in 2011, and now we’ve reached that plateau where we can set up base camp and set out to explore new slopes.

It is not so much the version number 4, or the adjective “normative”, that defines FHIR’s maturity. More important indicators are the now countless FHIR implementations around the world, the growing number of countries that ‘officially’ adopted the standard one way or the other, the manifold libraries and tools out there (of which you will see a lot during DevDays), the companies that are starting to recognize the business value (thank you DevDays sponsors!), and the FHIR flame logo popping up everywhere in product brochures and presentations.

But the most important indicator is the ever-growing FHIR community – people like you, who believe that FHIR is an opportunity to make their job more meaningful and exciting. People who believe they can achieve more with less effort. We see so many young and talented people entering the space. For me, this is the most amazing part of FHIR: imagining how the collective brain power of the FHIR community will contribute to improving our industry.

Thank you for being here.

Grahame Grieve
FHIR Product Director
HL7 International
Welcome to HL7® FHIR® DevDays 2019 | Be a part of the change in healthcare!

On behalf of Health Level Seven International, I would like to welcome you to the HL7 FHIR DevDays 2019 in Redmond, WA. You’re in for a very special treat! With a program that features 70 speakers over three days, this event is so packed with content that your biggest challenge will be choosing which sessions to attend.

Our program offers something for everyone, including special events such as:

- Student & Startup Tracks
- Pop-up Sessions
- Hands-on Meet & Code
- Community & Tooling Sessions
- Let’s build! Sessions
- FHIR Tutorials

Whether you’re a:

- newbie who needs to learn the ropes and get up to speed on FHIR;
- FHIR developer who wants to learn from others how to do it right;
- designer/architect who wants to see how to fit FHIR into your products/organization;
- or corporate Thought Leader who needs to better understand FHIR’s impact;

this event brings together the best and brightest FHIR experts in the world to help you succeed in your FHIR journey.

Finally, I would like to thank our sponsors of the 2019 HL7 FHIR DevDays event. Their support helps us empower you to change the face of global health data interoperability.

Calvin Beebe
Board Chair, HL7 International
**GENERAL INFORMATION**

**Internet access**
Complimentary wireless internet is available to all attendees.

Network: MSFTGUEST
Password: mseven46lm

**Twitter**
@HL7
@FirelyTeam
#FHIRDevDays

**Website**
Please check [www.devdays.com/us](http://www.devdays.com/us) for the latest news.

**Venue**
Microsoft Conference Center, Building 33
16070 NE 36th Way
Redmond, WA 98042

**Parking**
Free parking is available to all attendees below the Microsoft Conference Center, Building 33.

**Badge**
A conference badge will be provided upon check-in at the registration desk and it must be worn at all times.

**Cloakroom & luggage**
Belongings can be left in the cloakroom, including suitcases on the last conference day.

---

**Registration desk & hours**
The registration desk is located in the hallway.

The registration desk is open during the following hours:
- **Monday:** 7:30 am – 8:00 pm
- **Tuesday:** 8:00 am – 4:30 pm
- **Wednesday:** 8:00 am – 4:00 pm

---

**Meals & breaks**
Registration fee includes:
- Lunches on Monday, Tuesday and Wednesday
- Dinner on Monday
- Social event and dinner on Tuesday
- Farewell drinks on Wednesday
- Coffee, tea and water will be available throughout the day
*Please note: breakfast is not included.*

**Event staff questions?**
Just ask anyone wearing a yellow HL7 FHIR DevDays shirt and they will be happy to assist you.

**Announcements**
Please check the screens in the hallways for announcements and updates on the program.

**Exercises**
Exercises are available for select tutorials and can be found at:

---

**Presentations**
If you miss out on a session or want to see it again, all session recordings and slides with permission to share will be sent to attendees following the event. They will also be posted on the conference website after six months at [www.devdays.com](http://www.devdays.com).

**Photographer**
A photographer will take the official HL7 FHIR DevDays group photo after lunch on Tuesday. Please plan to attend!

**Networking**
The Community Track offers a platform for sharing implementation experiences and best practices in a series of presentations. The structure of HL7 FHIR DevDays and the social event provide attendees with opportunities to meet others who are facing similar challenges.

**Meet & Code**
HL7 FHIR DevDays is about learning in a collaborative environment. Want to work with others on specific topics or issues? Choose a topic and a table and work side-by-side. Exercises are available on-line for most of the tracks and can be found on the website. The McKinley room is the dedicated Meet & Code area.

**Chair massage**
Take some time to relax while enjoying a free chair massage. The professional therapists are at DevDays on:
- **Monday:** 3:15 pm – 6:45 pm
- **Tuesday:** 3:00 pm – 6:00 pm
- **Wednesday:** 9:45 am – 1:45 pm

---

**Sponsors**
We appreciate our sponsors’ commitment to making HL7 FHIR DevDays a great experience! Please be sure to visit the Sponsors Row to meet them and learn more about how they are impacting interoperability.

**Evaluation form**
Your feedback is important. After the event, you will receive a link to the evaluation form. Please take a moment to complete this form as we will use your feedback to improve future events.

**Insurance and liabilities**
The organizers are not liable for any loss, (physical) injuries or damages suffered at HL7 FHIR DevDays 2019. This includes damage, theft or loss of property of a delegate, unless this is the result of gross negligence or willful misconduct by the HL7 FHIR DevDays 2019 organizers.

---

**Event support**
HL7 Director of Meetings
Mary Ann Boyle
maryann@HL7.org
+1 734-677-7777

Firely DevDays Conference Director
Marita Mantle-Kloosterboer
devdays@fire.ly
+31 6 254 333 96

---

**Contact information**
Firely DevDays
Marita Mantle-Kloosterboer
Firely DevDays Conference Director
devdays@fire.ly
+31 6 254 333 96

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**Parking**
Free parking is available to all attendees below the Microsoft Conference Center, Building 33.
STUDENTS & STARTUPS

Student Track
Since the very first edition of DevDays in our office in Amsterdam, we have organized a special track for students. The Student Track offers students the opportunity to learn about FHIR first hand and collaborate in hands-on exercises with their peers.

This year, seven teams have competed for the Student Track 2019 Redmond Cup in an online hackathon. We nominated three teams who are invited to present their work at DevDays:

1. McMaster University
   Mentor: Dr. Kamran Sartipi
   Team members: Bellraj Eapen, Eduardo López and Sinu Jackson

2. Duke University
   Mentor: W. Ed Hammond, PhD
   Team members: Allison Young, Brinnae Bent, Ruiqi Wang and Yifei Wang

3. Georgia Institute of Technology
   Mentor: Alex MacDonald
   Team members: Romeo Cabanan, Maurice Pruna and Ricardo Martinez

Interested in seeing some inspiring demos by students? Please feel free to join us on Tuesday in the St Helens room. After the team presentations the final winners of the Student Track will be announced.

Startup Track
HL7 FHIR DevDays features a Startup Track, which will take place on June 11.

The following startups have been selected to compete:
- Dendrosite
- Invio
- MatchRite Care
- NursIT Institute
- Protenus

Their products will compete on:
- how FHIR enables the concept to work
- how innovative the idea is
- the business value the product offers

Join us in St. Helens to see innovation made real with FHIR by startups. The product pitches are scheduled from 2:10 - 2:50 pm.

Please add the following sessions to your calendar on June 11:
- 3:20 – 4:00 pm: Student team presentations
- 2:10 - 2:50 pm: Product pitches Startup Track
- 4:10 - 4:50 pm: Winners Student and Startup Track
Let’s plant some trees!

HL7 FHIR has become a reality with the help of planes, trains and automobiles transporting health IT professionals to connectathons and working group meetings to build the standard.

A result of travel is carbon dioxide emission, so while we are improving healthcare we are also being detrimental to the planet. HL7 FHIR DevDays wants to help you make a difference and improve our environment. We are partnering with One Tree Planted, an international nonprofit organization working with people all over the world to plant trees in their regions.

When you registered, you had the possibility to add a tree to your order. If you were unable to purchase a tree at that time but wish to do so now, a donation box is available at the registration desk.

For every tree that you buy, HL7 will double your impact by buying another!

The trees will be planted in Washington State and California. Our goal is to plant 2,000 trees in support of the Million Tree Challenge, which will help reforestation efforts in California. Together we can make a difference!

Social Event: MoPOP

After a day in the trenches, roll up your sleeves and get ready for some serious fun!

The party kicks off with dinner at the Microsoft Conference Center, followed by a road rally (by bus) to our final destination: a takeover of Seattle’s Museum of Pop Culture (MoPOP) for the evening. The party ramps up with music, food, drinks and activities in an architecturally unique setting, perfect for our diverse community!

As the evening concludes, the road rally reverses back to Redmond and we gear up for the final day of DevDays (or continue the party if you wish!).

PROGRAM | TUESDAY, JUNE 11, 2019

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>5:00 - 6:00 pm</td>
<td>Dinner inside MSCC</td>
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<tr>
<td>6:15 - 6:30 pm</td>
<td>Board buses</td>
</tr>
<tr>
<td>6:30 - 7:30 pm</td>
<td>Travel by bus to MoPop</td>
</tr>
<tr>
<td>7:30 - 10:00 pm</td>
<td>Museum of Pop Culture tour and reception</td>
</tr>
<tr>
<td>9:30 - 10:00 pm</td>
<td>Load buses to return to MSCC</td>
</tr>
</tbody>
</table>
Microsoft Conference Center

SERVICES

- Restrooms

MEETING & EVENTS

- Kodiak
- Rainier
- St. Helens
- Sonora
- Lassen
- Baker
- Hood
- McKinley
Meet & Code

Meet up with the experts and fellow participants. Sit down and code. Continue working on exercises. Or discuss your own use case with others. Grab a coffee and come to the McKinley room, where we have tables set up with flags indicating the DevDays tracks. This space is available throughout the duration of the event, but is most likely to be filled during the Meet & Code time slots.

Community Track

The Community Track consists of 10 sessions on FHIR projects and FHIR tools. Each project session consists of two community presentations that focus on the implementation best practices. The aim is for software implementers (even if they’re not using the same architecture or development platform) to learn from the development approach used in other projects.

The Tooling Sessions, which are part of the Community Track, are comprised of a series of eight-minute introductory talks, each of which covers a tool or toolkit that may simplify the life of FHIR implementers.

Pop-up Sessions

Why stick to the regular schedule? If you have a great idea that you want to share or discuss with other participants or speakers, come over to the registration desk and we will make sure you get a room. Start your session off with a brief introduction on the topic and proceed from there. You may wish to have an interactive session with the audience, demo a product or solution or even participate in plenary coding.
**Introduction to FHIR**
9:00 am - 9:40 am
Simone Heckmann

**Payer/Clinical data exchange**
9:00 am - 9:40 am
Viet Nguyen

**Towards Computable Guidelines and beyond with FHIR**
9:00 am - 9:40 am
Paula Braun, Maria Michaels

**FHIR for clinicians**
9:00 am - 9:40 am
David Hay

**FHIR Documents**
9:00 am - 9:40 am
Rick Geimer

**Healthcare Directories**
9:00 am - 9:40 am
Brian Postlethwaite

**FHIR 5**
9:00 am - 9:40 am
Grahame Grieve

**FHIR for clinicians**
9:00 am - 9:40 am
David Hay

**FHIR Profiling overview**
10:15 am - 10:55 am
Michel Rutten

**FHIR Proficiency Exam preparation**
10:15 am - 10:55 am
Simone Heckmann

**Java and .NET FHIR client**
10:15 am - 10:55 am
James Agnew, Mirjam Baltus

**FHIR in Clinical Research**
10:15 am - 10:55 am
Sebastiaan Knijnenburg

**IHE XDS: adding two tablespoons of FHIR**
10:15 am - 10:55 am
Rene Spronk

**Let’s build! Modeling a clinical scenario**
10:15 am - 10:55 am
David Hay

**SQL on FHIR**
10:15 am - 10:55 am
Nick George

**COFFEE BREAK**
9:45 am - 10:15 am

**COFFEE BREAK**
9:45 am - 10:15 am
### SCHEDULE | MONDAY, JUNE 10, 2019

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<thead>
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<th>Kodiak</th>
<th>Rainier</th>
<th>St. Helens</th>
<th>Sonora</th>
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<tbody>
<tr>
<td>2:30</td>
<td>Questionnaire</td>
<td>Let’s build! FHIM mapping examples</td>
<td>Working with FHIRpath</td>
<td>Working with FHIRpath</td>
</tr>
<tr>
<td></td>
<td>Eric Haas, Brian Postlethwaite</td>
<td>2:40 pm - 3:20 pm</td>
<td>2:40 pm - 3:20 pm</td>
<td>2:40 pm - 3:20 pm</td>
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<tr>
<td></td>
<td>ARGONAUT</td>
<td>MAPPING</td>
<td>DEVELOPER</td>
<td>DEVELOPER</td>
</tr>
<tr>
<td>3:00</td>
<td>Argonaut Data Query on FHIR R4</td>
<td>Let’s build! Personal Health Device Data on FHIR</td>
<td>Let’s build! Integration of Amazon Comprehend Medical with a FHIR server</td>
<td>Pop-up Sessions</td>
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<td></td>
<td>3:50 pm - 4:30 pm</td>
<td>3:50 pm - 4:30 pm</td>
<td>3:50 pm - 4:30 pm</td>
<td>3:50 pm - 4:30 pm</td>
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<tr>
<td></td>
<td>Eric Haas</td>
<td>Melanie Yeung</td>
<td>Misun Mallick</td>
<td>DEVELOPER</td>
</tr>
<tr>
<td></td>
<td>ARGONAUT</td>
<td>SPECIAL TOPICS</td>
<td>DEVELOPER</td>
<td>DEVELOPER</td>
</tr>
<tr>
<td>3:30</td>
<td>COFFEE BREAK</td>
<td>3:20 pm - 3:50 pm</td>
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<tr>
<td>4:00</td>
<td>Managing multiple versions</td>
<td>Let’s build! A Vonk plug-in</td>
<td>Let’s build! Questionnaire</td>
<td>Pop-up Sessions</td>
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<tr>
<td></td>
<td>4:40 pm - 5:20 pm</td>
<td>4:40 pm - 5:20 pm</td>
<td>4:40 pm - 5:20 pm</td>
<td>4:40 pm - 5:20 pm</td>
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<td>Eric Haas, Brian Postlethwaite</td>
<td>Eric Haas, Brian Postlethwaite</td>
<td>DEVELOPER</td>
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<td>BUILDING SERVERS</td>
<td>ARGONAUT</td>
<td>DEVELOPER</td>
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<tr>
<td>5:00</td>
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### Advanced Level
- **Material UI on FHIR**
  - 2:40 pm - 3:20 pm
  - Abigail Watson
- **Let’s build! An implementation guide**
  - 2:40 pm - 3:20 pm
  - Ardon Toonstra, Lloyd McKenzie
- **FHIR projects**
  - 2:40 pm - 3:20 pm
  - Kenny Blanchette, Samantha Robicheau

### Introductory Level
- **Argonaut Data Query on FHIR R4**
  - 3:50 pm - 4:30 pm
  - Eric Haas
- **Let’s build! Personal Health Device Data on FHIR**
  - 3:50 pm - 4:30 pm
  - Melanie Yeung
- **Let’s build! Integration of Amazon Comprehend Medical with a FHIR server**
  - 3:50 pm - 4:30 pm
  - Misun Mallick
- **Pop-up Sessions**
  - 3:50 pm - 4:30 pm
  - DEVELOPER
- **Managing multiple versions**
  - 4:40 pm - 5:20 pm
  - Graham Grieve
- **Let’s build! A Vonk plug-in**
  - 4:40 pm - 5:20 pm
  - Eric Haas, Brian Postlethwaite
- **Let’s build! Questionnaire**
  - 4:40 pm - 5:20 pm
  - Eric Haas, Brian Postlethwaite
- **Pop-up Sessions**
  - 4:40 pm - 5:20 pm
  - DEVELOPER

### Special Topics
- **Argonaut Data Query on FHIR R4**
  - 3:50 pm - 4:30 pm
  - Eric Haas
- **Let’s build! Personal Health Device Data on FHIR**
  - 3:50 pm - 4:30 pm
  - Melanie Yeung
- **Let’s build! Integration of Amazon Comprehend Medical with a FHIR server**
  - 3:50 pm - 4:30 pm
  - Misun Mallick
- **Pop-up Sessions**
  - 3:50 pm - 4:30 pm
  - DEVELOPER
- **Managing multiple versions**
  - 4:40 pm - 5:20 pm
  - Graham Grieve
- **Let’s build! A Vonk plug-in**
  - 4:40 pm - 5:20 pm
  - Eric Haas, Brian Postlethwaite
- **Let’s build! Questionnaire**
  - 4:40 pm - 5:20 pm
  - Eric Haas, Brian Postlethwaite
- **Pop-up Sessions**
  - 4:40 pm - 5:20 pm
  - DEVELOPER

### Community
- **Argonaut Data Query on FHIR R4**
  - 3:50 pm - 4:30 pm
  - Eric Haas
- **Let’s build! Personal Health Device Data on FHIR**
  - 3:50 pm - 4:30 pm
  - Melanie Yeung
- **Let’s build! Integration of Amazon Comprehend Medical with a FHIR server**
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  - Eric Haas, Brian Postlethwaite
- **Pop-up Sessions**
  - 4:40 pm - 5:20 pm
  - DEVELOPER
## SCHEDULE | MONDAY, JUNE 10, 2019

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<thead>
<tr>
<th>Time</th>
<th>Location</th>
<th>Event</th>
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<tbody>
<tr>
<td>5:30</td>
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<td>FOOD &amp; DRINKS</td>
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<td>Lassen</td>
<td>FOOD &amp; DRINKS</td>
</tr>
<tr>
<td>6:00</td>
<td>Rainier</td>
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<tr>
<td></td>
<td>Baker</td>
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</tr>
<tr>
<td>6:30</td>
<td>St. Helens</td>
<td>Meet &amp; Code</td>
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<td></td>
<td>Hood</td>
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<tr>
<td>7:00</td>
<td>Sonora</td>
<td>Pop-up Sessions</td>
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<tr>
<td></td>
<td>McKinley</td>
<td>Pop-up Sessions</td>
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</tbody>
</table>
| 7:00 |          | Introductory Level
| 8:00 |          | Advanced Level
### SCHEDULE | TUESDAY, JUNE 11, 2019

<table>
<thead>
<tr>
<th>Time</th>
<th>Room</th>
<th>Location</th>
<th>Topic</th>
<th>Speaker(s)</th>
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<tr>
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<td>McKinley</td>
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<td>Lassen</td>
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<td>Baker</td>
<td>REGISTRATION</td>
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<td>REGISTRATION</td>
<td>Hood</td>
<td>REGISTRATION</td>
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<td>8:00</td>
<td>REGISTRATION</td>
<td>McKinley</td>
<td>REGISTRATION</td>
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<tr>
<td>8:30</td>
<td>Opening &amp; Keynote</td>
<td>Kodiak</td>
<td>Next Generation Quality Measurement with FHIR</td>
<td>Nikolai Schwertner</td>
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<tr>
<td>8:30</td>
<td>Opening &amp; Keynote</td>
<td>McKinley</td>
<td>Flicker or Bonfire – How design choices affect FHIR’s power</td>
<td>Lloyd McKenzie</td>
</tr>
<tr>
<td>8:30</td>
<td>Opening &amp; Keynote</td>
<td>Lassen</td>
<td>FHIR and Genomics</td>
<td>Gil Alterovitz</td>
</tr>
<tr>
<td>9:30</td>
<td>Building and testing SMART on FHIR Apps with HSPC Sandbox 2019</td>
<td>Sonora</td>
<td>Opening Startup Track</td>
<td>Vadim Peretokin</td>
</tr>
<tr>
<td>9:30</td>
<td>Storage and analytics</td>
<td>Hood</td>
<td>How and when to use FHIR Terminology Service APIs</td>
<td>Jim Steel</td>
</tr>
<tr>
<td>9:30</td>
<td>Let's build! Next Generation Quality Reporting with FHIR</td>
<td>Sonora</td>
<td>Interceptors and Subscriptions in HAPI FHIR</td>
<td>John Stairs</td>
</tr>
<tr>
<td>9:30</td>
<td>Meet &amp; Code</td>
<td>McKinley</td>
<td>Let's build! How and when to use FHIR Terminology Service APIs</td>
<td>Jim Steel</td>
</tr>
<tr>
<td>9:30</td>
<td>ONC Rule open API</td>
<td>Lassen</td>
<td>How to add a FHIR API to an existing database</td>
<td>James Agnew</td>
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<tr>
<td>10:00</td>
<td>COFFEE BREAK</td>
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<td>10:00</td>
<td>COFFEE BREAK</td>
<td>McKinley</td>
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<td>Lassen</td>
<td>COFFEE BREAK</td>
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<td>10:00</td>
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<td>Baker</td>
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<td>10:00</td>
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<td>Hood</td>
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<tr>
<td>10:00</td>
<td>COFFEE BREAK</td>
<td>McKinley</td>
<td>COFFEE BREAK</td>
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</tr>
<tr>
<td>10:30</td>
<td>Let's build! My first profile</td>
<td>Sonora</td>
<td>Let's build! My first profile</td>
<td>Lilian Minne, Ardon Toonstra, Michel Rutten</td>
</tr>
<tr>
<td>10:30</td>
<td>Meet &amp; Code</td>
<td>McKinley</td>
<td>Meet &amp; Code</td>
<td>Jim Steel</td>
</tr>
<tr>
<td>11:00</td>
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<td>Lassen</td>
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<td>11:00</td>
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<td>Baker</td>
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<td>Hood</td>
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<tr>
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<td>McKinley</td>
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</tr>
</tbody>
</table>
### SCHEDULE | TUESDAY, JUNE 11, 2019

<table>
<thead>
<tr>
<th>Time</th>
<th>Location</th>
<th>Session</th>
<th>Speaker(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>11:00</td>
<td>Kodiak</td>
<td>Security in FHIR</td>
<td>Andrew Marcus</td>
</tr>
<tr>
<td>11:00</td>
<td>Rainier</td>
<td>Getting started with the common data model with OMOP on FHIR</td>
<td>David Yue, Dennis Patterson</td>
</tr>
<tr>
<td>12:00</td>
<td>Sonora</td>
<td>Let's build! CDS Hooks Services</td>
<td>Simona Carini, Eric Haas</td>
</tr>
<tr>
<td>12:00</td>
<td>St. Helens</td>
<td>Open mHealth (OmH) and FHIR</td>
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<tr>
<td>11:30</td>
<td>Sonora</td>
<td><strong>Security in FHIR</strong></td>
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</tr>
<tr>
<td>11:30</td>
<td>McKinley</td>
<td><strong>Managing patient merge</strong></td>
<td>Grahame Grieve</td>
</tr>
<tr>
<td>12:00</td>
<td>McKinley</td>
<td><strong>Let's build! CDS Hooks Services</strong></td>
<td>Daniel Benjamin</td>
</tr>
<tr>
<td>12:30</td>
<td>McKinley</td>
<td><strong>Keynotes</strong></td>
<td>Greg Simon, Dana Lewis</td>
</tr>
<tr>
<td>13:00</td>
<td>McKinley</td>
<td><strong>Startup Presentations</strong></td>
<td>Selected startup companies</td>
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<tr>
<td>13:30</td>
<td>McKinley</td>
<td><strong>Pop-up Sessions</strong></td>
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<tr>
<td>14:00</td>
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<td><strong>Repeated session</strong></td>
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<tr>
<td>14:30</td>
<td>McKinley</td>
<td><strong>Trial Site to Sponsor Lab data exchange with HL7 FHIR</strong></td>
<td>Amy Nordo, Roland Hartich</td>
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<tr>
<td>15:00</td>
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<td><strong>FHIR projects</strong></td>
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<td><strong>FHIR projects</strong></td>
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### SCHEDULE | TUESDAY, JUNE 11, 2019

| 11:00 | Lassen  | Firely tooling for putting FHIR in production                                              | Vadim Peretokin                                                          |
| 11:30 | Lassen  | Packages and versioning                                                                     | Martijn Harthoorn                                                        |
| 12:00 | Lassen  | FHIR projects                                                                               | Simone Heckmann, Chris Ward                                              |
| 12:30 | Lassen  | **Firely tooling for putting FHIR in production**                                          |                                                                           |
| 13:00 | Lassen  | **Packages and versioning**                                                                  |                                                                           |
| 13:30 | Lassen  | **FHIR projects**                                                                           |                                                                           |
| 14:00 | Lassen  | **FHIR projects**                                                                           |                                                                           |
| 14:30 | Lassen  | **FHIR projects**                                                                           |                                                                           |
| 15:00 | Lassen  | **FHIR projects**                                                                           |                                                                           |
| 16:00 | Lassen  | **FHIR projects**                                                                           |                                                                           |
| 17:00 | Lassen  | **FHIR projects**                                                                           |                                                                           |
**3:30**

**Using LOINC with FHIR**
3:20 pm - 4:00 pm
Dan Vreeman

**Student Team Presentations**
3:20 pm - 4:00 pm
Student teams

**Pop-up Sessions**
3:20 pm - 4:00 pm

**Let’s build! Patient Mediated Data Connectivity**
4:10 pm - 4:50 pm
Ricky Sahu

**Winners of Student and Startup Track**
4:10 pm - 4:50 pm

**Pop-up Sessions**
4:10 pm - 4:50 pm

**4:00**

**SOCIAL EVENT**
5:00 pm - 10:00 pm
See page 13 for details

**4:10 pm - 4:50 pm**

**Graphql / GraphDefinition**
4:10 pm - 4:50 pm
Grahame Grieve

**FHIR projects**
3:20 pm - 4:00 pm
Lauren Cairco Dukes, Lucienne Ide

**Repeated session**
4:10 pm - 4:50 pm
Session will be announced at the event.

**Student Team Presentations**
4:20 pm - 4:50 pm
Student teams

**Graphql / GraphDefinition**
4:20 pm - 4:50 pm
Grahame Grieve

**FHIR Server Certification with Inferno**
4:20 pm - 4:50 pm
Robert Scanlon

**4:30 pm - 4:50 pm**

**SOCIAL EVENT**
5:00 pm - 10:00 pm
See page 13 for details

**5:00**

**COFFEE BREAK**
2:50 pm - 3:20 pm

**Meet & Code**
10:30 am - 4:50 pm
### SCHEDULE | WEDNESDAY, JUNE 12, 2019

<table>
<thead>
<tr>
<th>Time</th>
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<tbody>
<tr>
<td>11:00</td>
<td>Kodiak</td>
<td>Let's build! A Synthetic FHIR Dataset</td>
</tr>
<tr>
<td></td>
<td></td>
<td>11:05 am - 11:45 am</td>
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<tr>
<td></td>
<td></td>
<td>Jason Walonoski</td>
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<tr>
<td></td>
<td></td>
<td>DEVELOPER</td>
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<tr>
<td>11:30</td>
<td>Rainier</td>
<td>Let's build! Google Cloud on FHIR</td>
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<tr>
<td></td>
<td></td>
<td>11:05 am - 11:45 am</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Kurt Ericson</td>
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<td></td>
<td></td>
<td>DEVELOPER</td>
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<tr>
<td>12:00</td>
<td>St. Helens</td>
<td>Consumer Access /Advanced OAuth</td>
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<tr>
<td></td>
<td></td>
<td>11:05 am - 11:45 am</td>
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<tr>
<td></td>
<td></td>
<td>Josh Mandel</td>
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<td></td>
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<td>SECURITY</td>
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<tr>
<td>12:30</td>
<td>Sonora</td>
<td>Pop-up Sessions</td>
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<tr>
<td></td>
<td></td>
<td>11:05 am - 11:45 am</td>
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<tr>
<td></td>
<td></td>
<td>Let's build! A FHIR package</td>
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<tr>
<td></td>
<td></td>
<td>11:05 am - 11:45 am</td>
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<tr>
<td></td>
<td></td>
<td>Ardon Toonstra</td>
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<td>Pop-up Sessions</td>
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<td></td>
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<td>11:05 am - 11:45 am</td>
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<tr>
<td></td>
<td></td>
<td>Validation of FHIR data</td>
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<td>11:55 am - 12:35 pm</td>
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<td>Ewout Kramer</td>
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<td>MODELING</td>
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<tr>
<td>1:00</td>
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<td>LUNCH</td>
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<td></td>
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<td>12:35 pm - 1:45 pm</td>
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<tr>
<td>1:30</td>
<td></td>
<td>LUNCH</td>
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<tr>
<td></td>
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<td>12:35 pm - 1:45 pm</td>
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<tr>
<td>2:00</td>
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<td>Keynotes</td>
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<td>1:45 pm - 2:30 pm</td>
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<td>Peter Lee, Judy W. Gichoya</td>
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**Introductory Level**  
**Advanced Level**
<table>
<thead>
<tr>
<th>Time</th>
<th>Location</th>
<th>Event</th>
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</thead>
<tbody>
<tr>
<td>2:30</td>
<td>McKinley</td>
<td>Meet &amp; Code</td>
</tr>
<tr>
<td>2:40 pm - 3:20 pm</td>
<td>Lassen</td>
<td>Repeated session</td>
</tr>
<tr>
<td>2:40 pm - 3:20 pm</td>
<td>Baker</td>
<td>Let's build! Search in FHIR</td>
</tr>
<tr>
<td>2:40 pm - 3:20 pm</td>
<td>Hood</td>
<td>FHIR projects</td>
</tr>
<tr>
<td>2:40 pm - 3:20 pm</td>
<td>Sonora</td>
<td>Pop-up Sessions</td>
</tr>
<tr>
<td>2:40 pm - 3:20 pm</td>
<td>Rainier</td>
<td>Let's build! A FHIR sandbox in 30 minutes</td>
</tr>
<tr>
<td>2:40 pm - 3:20 pm</td>
<td>Kodiak</td>
<td>FHIR Bulk Data API</td>
</tr>
</tbody>
</table>

**Introductory Level**

- Lassen: Repeated session
- Baker: Let's build! Search in FHIR
- Hood: FHIR projects

**Advanced Level**

- Sonora: Pop-up Sessions
- Rainier: Let's build! A FHIR sandbox in 30 minutes
- Kodiak: FHIR Bulk Data API

**Thanks for attending HL7 FHIR DevDays 2019!**
Welcome to the HL7 FHIR DevDays in Redmond!

**Opening**

Wayne Kubick

*Target audience: All participants*

**Towards Computable Guidelines and beyond with FHIR**

Paula Braun
Maria Michaels

*9:00 - 9:40 am | St. Helens*

*Type: Tutorial*

*Target audience: Developers, data requestors, architects, project leaders*

This tutorial will demonstrate how CDC’s strategic priorities and needs align with work already underway by established FHIR accelerators (such as the Argonaut and Da Vinci projects) and its mission and data needs are consistent with federal counterparts. This includes how using FHIR to represent the recommendations within clinical practice guidelines can help produce sharable and interoperable clinical decision support, next generation clinical quality measures and streamlined reporting and referrals. This session will highlight the reusability of FHIR profiles across these areas and provide an overview of a draft implementation guide on the representation of clinical practice guideline recommendations in FHIR (CPG-on-FHIR).

**Introduction to FHIR**

Simone Heckmann

*9:00 - 9:40 am | Kodiak*

*Type: Tutorial*

*Target audience: Those who are new to FHIR, both technical and non-technical*

This tutorial provides a brief introduction and overview of the FHIR specification. We will examine the basic concepts of FHIR resources and supported interoperability paradigms. An instructor led demo will illustrate a FHIR-in-action scenario. If you are new to FHIR, this is a great place to start.

**FHIR for clinicians**

David Hay

*9:00 - 9:40 am | Sonora*

*Type: Tutorial*

*Target audience: Clinicians, payers, vendors, developers*

This presentation is an introduction to FHIR for the clinical and business user. We’ll talk about what FHIR is, why it was developed and the benefits that it brings to clinicians and others. The topics include the main parts of FHIR - resources, connections between resources and terminology as well as touching on profiling - making FHIR work for you! The objective of this session is to prepare a clinician for participating in FHIR related projects.

**Payer/Clinical data exchange**

Viep Nguyen

*9:00 - 9:40 am | Rainier*

*Type: Tutorial*

*Target audience: Payers, providers and HIT vendors to address use cases in value based care. In this session, participants deep dive into two Da Vinci use cases: Payer Data Exchange and Clinical Data Exchange. Participants will learn how payer-sourced data can be made available to clinicians to support clinical care and how provider-sourced data will be transmitted to payers to support care management, auditing and risk adjustment.

**FHIR Documents**

Rick Geimer

*9:00 - 9:40 am | Lassen*

*Type: Tutorial*

*Target audience: Software developers, informaticists and practitioners who author clinical documents*

This tutorial will provide a brief introduction to FHIR documents. We will explore the core resources used for documents, such as Composition, Bundle and DocumentReference. We will also discuss current applications of FHIR documents, such as the C-CDA on FHIR spec, electronic case reporting and pharmacist care plan documents. We will also discuss converting CDA documents to FHIR documents. An instructor led demo will conclude the session.

**Healthcare Directories**

Brian Postlethwaite

*9:00 - 9:40 am | Baker*

*Type: Tutorial*

This tutorial will demonstrate how to use FHIR for creating healthcare directories. We will explore common use cases, such as FHIR registries, package management and FHIR conformance layer and its principal components, such as profiles, extensions and implementation guides, and learn about its benefits and capabilities. We will present collaborative authoring and publication workflows, discuss related concepts such as FHIR profiles, FHIR registries, FHIR terminology and introduce available tooling. This session is targeting beginners and intermediates and will prepare you for attending the hands-on sessions "Profiling in practice" and "Let's Build My first profile!".

**FHIR 5**

Graeme Grieve

*9:00 - 9:40 am | Hood*

*Type: Tutorial*

*Target audience: Beginners and intermediates*

This session will present the FHIR RS roadmap, which covers both changes to the FHIR standard itself and the other major plans that the FHIR community has during the next couple of years. The session will include: what’s in RS, what’s not in RS, when is it likely to land, should I wait for RS before committing and what is the FHIR community doing to increase real world penetration in solutions.

**FHIR Proficiency Exam preparation**

Simone Heckmann

*10:15 - 10:55 am | Rainier*

*Type: Tutorial*

*Target audience: Experienced FHIR developers/specialists who aim for official certification of their skills or FHIR beginners who are willing to dive deep into the specification with the purpose of achieving certification*

The tutorial will inform participants about the requirements for taking the HL7 FHIR Proficiency Exam. We will take a quick look over the topics that are covered by the exam, give tips for how to prepare and test your knowledge with a few training questions. At the end you can decide whether you’re ready to take the exam or need more time to study.

**Java and .NET FHIR client**

James Agnew
Mirjam Baltus

*10:15 - 10:55 am | St. Helens*

*Type: Tutorial*

*Target audience: Business analysts wanting an understanding of their skills or FHIR beginners who are willing to dive deep into the specification with the purpose of achieving certification*

This tutorial will explain several parts of the API. Code examples will be provided for creating resource instances, sending requests to servers and inspecting the responses. Join James and Mirjam after this session for the guided Let’s build! session, where you will build your first FHIR client using what you’ve just learned.
Electronic Data Capture (EDC) in clinical trials has been a manual, time-consuming and error-prone task. Automated data entry via EHR linkage can greatly improve the efficiency of research personnel, improve the quality of the collected data and reduce costs. As FHIR adoption in hospitals and EHRs rises, the EHR becomes a valuable data source for EDC tools.

In this session we will discuss how the clinical research process works, from hypothesis to analysis, assess where FHIR can play a role, share our experiences with integrating two EHRs into an online EDC tool (Castor EDC) via FHIR and discuss a reference architecture for gathering research data via FHIR.

IHE XDS: adding two tablespoons of FHIR

RENE SPRONK
10:15 - 10:55 am | Lassen
Track: FHIR Documents
Type: Tutorial
Introductory Level

What happens if you combine the strengths of XDS with those of FHIR? XDS is mainly used for the exchange of documents between organizations. FHIR is mainly used for the exchange of resources with apps. This talk explores how this combination is currently leveraged by various projects, and how XDS & FHIR could be used if one extrapolates the current usage of both XDS as well as FHIR. Topics include MHD (the FHIR version of XDS), FHIR documents, full text search in XDS documents, the link with RESTful DICOM, the exchange of random FHIR bundles instead of documents and the power of on-demand documents.

In short: a delicious dish comprised of a pinch of XDS documents and the power of on-demand documents. This exchange of random FHIR bundles instead of XDS documents, the link with RESTful DICOM, could be used if one extrapolates the current usage of both XDS as well as FHIR. Topics include MHD (the FHIR version of XDS), FHIR documents, full text search in XDS documents, the link with RESTful DICOM, the exchange of random FHIR bundles instead of documents and the power of on-demand documents.

Let's build! Modeling a clinical scenario

DAVID HAY
10:15 - 10:55 am | Baker
Track: Clinical Type: Tutorial
Let's build!

This session follows from the introduction and uses freely available tooling—clinFHIR—to build collections on resources that represent real clinical scenarios. We’ll start with a short demonstration, then it’s hands on! There will be a number of scenarios to choose from and you’ll be able to continue your work after the session—and, indeed, after the event. You’ll need a computer with a modern browser (we recommend Chrome) and a desire to learn!

Let’s build! Java and .NET FHIR client

JAMES AGNEW
11:05 - 11:45 am | S. Helens
Track: Building clients
Type: Tutorial
Let’s build!

Come and build your first FHIR client together with us! Using either the FHIR .Net API or the Java HAPI library, we will create a simple FHIR client that retrieves a Patient resource from a FHIR server. Next we will change some details in the Patient data and send the updated resource to the server again. After these first steps, we will create a search query and look at the server’s response. During the first part of the session you can code along with us. After that, we welcome you to try out any of the other options that we have talked about in our previous session.

SQL on FHIR

NICK GEORGE
10:15 - 10:55 am | Hood
Track: Developer
Type: Tutorial
Introductory Level

In this session, we present the work open-sourced at github.com/google/fhir. This package includes tools to help customize FHIR representations using profiles, including creating views suitable for SQL queries over large amounts of data. We’ll describe how we use this representation internally at Google and show examples of how you could use the same techniques in your own applications and systems.

A FHIR server: a swiss army knife in an IT architecture

MARCO VISSER
11:05 - 11:45 am | Rainier
Track: Building servers
Type: Tutorial
A FHIR server

• Do you want to support your researchers? Use a FHIR server as a Clinical Data Repository.
• Has your region started data exchange in FHIR? Setup a FHIR server as your integration point to the project and have it enforce the IG as a bonus.
• Data quality hard to maintain? State your rules as profiles and let a FHIR Server check them on your data.
• Do you have that legacy system that just won’t go away and won’t integrate either? Use a FHIR server as a facade on top of it and have it speak FHIR.
• Looking for a generic back end for your apps? Deploy a FHIR server that will host all the resources you need.

Marco will explain what a FHIR server actually is and can do and give an overview of all these uses.

Mechanics of FHIR in Reporting and Referrals

ARUNKUMAR SRINIVASAN
JOHN LOONSK
11:05 - 11:45 am | Sonora
Track: Public Health
Type: Tutorial
Mechanics of FHIR

This session covers how to leverage FHIR in addressing different public and population health use cases. Learn to use FHIR subscriptions and planDefinitions in the context of distributing knowledge to EHRs and using the “when, where and how” for public health reporting. Develop a deeper understanding in designing FHIR Messaging headers, FHIR bundles and state machines in the context of easing interorganizational bidirectional data exchange. Review the role of FHIR communication resources as well as the uses of FHIR bundles as an approach to managing granular data segmentation. This session will offer practical technical examples, code snippets and exercises from the electronic case reporting (eCR) and Bidirectional Services eReferrals (BSeR) usecases. Leverage the Meet & Code sessions throughout the meeting to work with the presenters on the exercises offered during this session.

Profiling in practice

LILIAN MINNE
11:05 - 11:45 am | Lassen
Track: Modeling
Type: Tutorial
Profiling in practice

This session will introduce Profiling Academy and address profiling in practice. You will receive guidelines, best practices, tips and tricks that you can use in your own profiling project.
SNOMED overview

RORY DAVIDSON
11:05 - 11:45 am | Baker

Track: Terminology
Type: Tutorial
Introductory Level

Target audience: General, anyone interested in using SNOMED CT with FHIR

This session will provide information and discussion on the clear exchange of health information for all using a universal, codified, clinical terminology (SNOMED CT) leveraging FHIR Terminology Services. The session will focus on an introduction to the SNOMED CT model and the specifics and differences that are useful to be aware of when using SNOMED CT and FHIR together. Specific areas covered will include using SNOMED CT Reference Sets with valuesets, working with the SNOMED CT Expression Constraint Language (ECL) and SNOMED URI standards as applicable to FHIR.

FHIR Mapping Language

VADIM PERETOKIN
11:55 am - 12:35 pm | Rainier

Track: Mapping
Type: Tutorial
Advanced Level

Learn how to use the FHIR mapping language and its updated syntax with an overview of the language, key concepts and practical examples. You can use the FHIR mapping language to transform content such as V2 and CCD to/from FHIR, though due to time constraints that will not be covered - join the “Let’s build!” session for that.

Clinical Notes

MICHELLE MILLER
11:55 am - 12:35 pm | St. Helens

Track: Argonaut
Type: Tutorial
Introductory Level

Target audience: Developers, architects, analysts

Clinical Notes is a broad label for textual narrative in the patient’s chart, such as consultation notes, discharge summaries, history and physical notes, procedure notes, progress notes, etc. This session will provide an overview of which FHIR resources should (and shouldn’t) be used to support clinical notes.

International Patient Summary

ROB HAUSAM
11:55 am - 12:35 pm | Sonora

Track: FHIR standard
Type: Tutorial
Introductory Level

Target audience: Implementers, EHR vendors, managers, providers and patients who are interested in making clinical data available or taking it with them and using it across boundaries

International Patient Summary - Opening new horizons for clinical data exchange.

The HL7 International Patient Summary (IPS) specification provides a minimal and non-exhaustive health record extract which is specialty agnostic and condition independent, clinically relevant and global in scope. It was initially developed as a clinical document designed for the needs of unscheduled, cross-border care of a patient. Now with the FHIR version the focus is broadened to cover additional clinical scenarios and uses of individual data components (FHIR profiles). The tutorial provides an introduction and overview of the FHIR IPS implementation guide specification, emphasizing the use and re-usability of individual data components, with the IPS Immunization profile as a specific example.

Da Vinci: Broad update

VIET NGUYEN
11:55 am - 12:35 pm | Lassen

Track: Da Vinci
Type: Tutorial
Introductory Level

Target audience: Clinicians, payers, vendors, Developers

The HL7 Da Vinci Project is a multi-stakeholder effort led by payers, providers and HIT vendors to address use cases in value based care. In this session, participants will learn about the Da Vinci processes for identifying use cases, creating implementation guides and developing reference implementations. There will also be an update on the new and in-flight use cases including Data Exchange for Quality Measures, Clinical Data Exchange, Patient Data Exchange, Document Templates and Payer Rules, and Prior Authorization Support.

Let’s build! SNOMED

RORY DAVIDSON
11:55 am - 12:35 pm | Baker

Track: Terminology
Type: Let’s build!
Introductory Level

Target audience: Software developers

Introduction to developing with SNOMED International’s FHIR enabled open source SNOMED CT terminology server through useful examples and exercises to get used to access SNOMED CT through FHIR Terminology Services.

This session is hands-on covering topics discussed in the SNOMED CT Overview session including using SNOMED CT reference sets with valuesets, working with the SNOMED CT Expression Constraint Language (ECL), and SNOMED URI standards as applicable to FHIR.
### Keynotes

<table>
<thead>
<tr>
<th>Name</th>
<th>Time</th>
<th>Location</th>
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<tr>
<td>Steven Posnack</td>
<td>1:45 - 2:30 pm</td>
<td>Kodiak</td>
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<tr>
<td>Micky Tripathi</td>
<td>1:45 - 2:30 pm</td>
<td>Kodiak</td>
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</tbody>
</table>

Plenary Session

**1.45 - 2:30 pm | Kodiak**

**STEVEN POSNACK**

**MICKY TRIPATHI**

1.45 pm - Steve Posnack, ONC

Answering the Call of FHIR: The Argonaut Project and FHIR Acceleration

This presentation will discuss the origins, accomplishments and status of the Argonaut Project and the impact it’s had on accelerating FHIR adoption.

### Working with FHIRpath

<table>
<thead>
<tr>
<th>Name</th>
<th>Time</th>
<th>Location</th>
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<tbody>
<tr>
<td>Ewout Kramer</td>
<td>2:40 - 3:20 pm</td>
<td>St. Helens</td>
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</tbody>
</table>

Track: Developer

Type: Tutorial

Introductory Level

Target audience: Profile authors, modelers

FHIRPath is a step traversal and extraction language much like XPath. It is used —amongst other things— for validation of instances. Learn about its syntax and structure so you can author FHIRPath expressions with confidence.

### Material UI on FHIR

<table>
<thead>
<tr>
<th>Name</th>
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<tbody>
<tr>
<td>Abigail Watson</td>
<td>2:40 - 3:20 pm</td>
<td>Lassen</td>
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</tbody>
</table>

Track: Building clients

Type: Tutorial

Learn how to convert FHIR resources into reusable and composable user interface components, using the popular React and Material UI libraries. This session will discuss how FHIR intersects user interface design paradigms. We will cover optimization, DOM management, functional programming, flattening resources, versioning, composability and otherwise developing great user interfaces using FHIR.

### Let's build! An implementation guide

<table>
<thead>
<tr>
<th>Name</th>
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<tbody>
<tr>
<td>Ardon Toonstra</td>
<td>2:40 - 3:20 pm</td>
<td>Baker</td>
</tr>
</tbody>
</table>

Track: Modeling

Type: Let’s build!

Introductory Level

Target audience: HIT Vendors, insurers, clinicians, health systems

This session will guide you in building your own FHIR Implementation Guide (IG), using the IG editor of Simplifier.net and the FHIR build tool.

### FHIR projects

<table>
<thead>
<tr>
<th>Name</th>
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<th>Location</th>
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<tbody>
<tr>
<td>Kenny Blanchette</td>
<td>2:40 - 3:20 pm</td>
<td>Hood</td>
</tr>
</tbody>
</table>

Track: Community

Type: Presentations

1. FHIR for product managers

Kenny Blanchette and Samantha Robicheau, Athenahealth

You’re convinced. FHIR is a valuable tool to improve healthcare interoperability. The executives are excited and the engineers are ready, but as a product manager trying to prioritize the right set of work, where do you start? Does your product need FHIR? Is it just an implementation detail? Do your users care? The key is keeping your team and organization focused on the user problems, not the technology. In this talk, we will share some lessons learned while delivering a product for our EHR users leveraging FHIR. You will learn a few ways you can articulate the value of FHIR to non-technical stakeholders and incorporate it into your product strategy. You will also better understand how your role changes (hint: it doesn’t!) when defining requirements and partnering with design in this space.

2. Second presentation to be announced.

### Argonaut data query on FHIR R4

<table>
<thead>
<tr>
<th>Name</th>
<th>Time</th>
<th>Location</th>
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<tbody>
<tr>
<td>Eric Haas</td>
<td>3:50 - 4:30 pm</td>
<td>St. Helens</td>
</tr>
</tbody>
</table>

Track: Argonaut

Type: Tutorial

Introductory Level

Target audience: All

Future ONC API/FHIR certification on your planning roadmap? Implementers planning for future US ONC certification requirements will benefit from hearing about the latest Argonaut data query efforts based on FHIR R4. Topics include a brief history on the guide, its relationship to other FHIR implementation guides including US Core, an overview of its contents and how it is expected to be used in the future.

### Let's build! Personal Health Device Data on FHIR

<table>
<thead>
<tr>
<th>Name</th>
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<tbody>
<tr>
<td>Melanie Yeung</td>
<td>3:50 - 4:30 pm</td>
<td>Rainier</td>
</tr>
</tbody>
</table>

Track: Special Topics

Type: Let’s build!

Introductory Level

Target audience: Attendees interested in integrating personal health device data into a FHIR service

Personal Connected Health Alliance (PCHAlliance) publishes and promotes the Continua Design Guidelines, an open framework using existing device standards for interoperability of devices used for applications monitoring personal health and wellness. This track will explore how device data generated from compliant devices are used in monitoring, analytics, clinical and other uses in informatics from hospital to home. Participants will gain experience in understanding how device data is represented in FHIR and how to work with the device data to build meaningful applications that can be used by patients, providers and caregivers.

### Let’s build! Integration of Amazon Comprehend Medical with a FHIR server

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<thead>
<tr>
<th>Name</th>
<th>Time</th>
<th>Location</th>
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<tbody>
<tr>
<td>Mithun Mallick</td>
<td>3:50 - 4:30 pm</td>
<td>St. Helens</td>
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</tbody>
</table>

Track: Developer

Type: Let’s build!

In this session you will learn to extract clinical entities from medical notes using Amazon Comprehend Medical and map them to FHIR resources. Attendees will then learn how to load the resources to FHIR repository by calling the interactions on a FHIR server.
Customizing IG Publisher templates

LLOYD MCKENZIE
3:50 - 4:30 pm | Baker
Track: Modeling
Type: Tutorial

The HL7 IG Publisher has undergone a shift to a template-based publication approach. These templates allow implementation guides (IG) to be published with a variety of aesthetics. The tutorial will examine the different pieces of a template and show how they work when publishing an implementation guide.

JEFF DANFORD
3:50 - 4:30 pm | Hood
Track: Community
Type: Presentations
1. Care Planning in FHIR
Jeff Danford, Aliscripts
This presentation provides a demonstration of how FHIR resources can be used to support standardized care planning for patients and how business logic may be incorporated into the process. This presentation is based on the work being done in the Care Planning track at the HL7 FHIR Connectathons and the Dynamic Care Planning profile recently published by IHE.
2. Second presentation to be announced.

Managing multiple versions

GRAHAME GRIEVE
4:40 - 5:20 pm | Kodiak
Track: FHIR standard
Type: Tutorial
Advanced Level

There have been three major releases of FHIR and the production of FHIR systems are spread across R2, R3 and R4. Grahame will discuss the features in the FHIR specification itself that relate to supporting multiple versions, and will describe some of the major implementation decisions relating to which version(s) to support.

Let's build! A Vonk plug-in

CHRISTIAAN KNAAP
4:40 - 5:20 pm | Rainier
Track: Building servers
Type: Let's build!

In its latest version, FHIR covers a lot of different topics: REST API, terminology services and mapping language. However, organizations often have unique constraints which require a set of custom operations when adopting FHIR.

This Let’s build session provides you with a practical walkthrough covering the following topics:
• How to extend the functionality of the Vonk FHIR server
• How to customize already existing services provided by the Vonk FHIR server
• How to connect to external web services and FHIR servers to retrieve information

Let’s build! Questionnaire

ERIC HAAS
BRIAN POSTLETHWAITE
4:40 - 5:20 pm | St. Helens
Track: Argonaut
Type: Let’s build!

In this Let’s build session we will be using some open source tools to create a basic forms, render those forms and capture the responses to the form as a QuestionnaireResponse resource.

Repeated session

4:40 - 5:20 pm | Lassen
This slot is reserved for a session which will be repeated. The session will be announced on the screens in the hallway.

Pop-up Sessions

Why stick to the regular schedule? If you have a great idea that you want to share or discuss with other participants or speakers, come over to the registration desk and we will make sure you get a room. Or if you already know, send us an email just prior to the event. Great ideas come before just good ideas.

Introduction to DICOM for Imaging and its FHIR integration

MOHANNAD HUSSAIN
4:40 - 5:20 pm | Baker
Track: Special Topics
Type: Tutorial

Target audience: HIT Vendors, insurers, clinicians, health systems

This session provides a formal introduction to DICOM for medical imaging. The session then proceeds to explore how DICOM integrates with FHIR to compliment the patient record. It will cover basic interactions with FHIR and DICOMweb to query for and retrieve images.

Let’s build! A Vonk plug-in

CHRISTIAAN KNAAP
4:40 - 5:20 pm | Rainier
Track: Building servers
Type: Let’s build!

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SESSIONS | TUESDAY, JUNE 11, 2019

Opening & Keynote

EWOUT KRAMER  ED HAMMOND
8:30 - 9:05 am | Kodiak

Plenary Session

Target audience: All participants
30 am Ewout Kramer, Firely
Learn about the highlights of the second day of HL7 FHIR DevDays 2019
8:45 am Ed Hammond, DCHI
Future of healthcare and research under FHIR

Building and testing SMART on FHIR
Apps with HSPC Sandbox 2019

NIKOLAI SCHWERTNER
9:15 - 9:55 am | Kodiak

Track: Building clients
Type: Tutorial

The Health Services Platform Consortium (HSPC) was founded in 2013 by Intermountain Healthcare, Louisiana State University and the Veteran’s Administration to improve health by creating a vibrant, open ecosystem of interoperable platforms, applications, and knowledge assets. This tutorial will provide an overview of the HSPC Developers Portal, HSPC Sandbox and the HSPC Gallery. The participants will learn how to effectively use the latest HSPC platform, SDKs and libraries, application samples, and documentation to set up their personal SMART on FHIR sandbox in the cloud. We will explore the steps for populating the sandbox with realistic clinical data. Finally, we will demonstrate the process of developing and testing health applications and CDS Hooks services in the sandbox environment that we created.

FHIR and Genomics

GIL ALTEROVITZ
9:15 - 9:55 am | Sonora

Track: Special Topics
Type: Tutorial

This session provide an introduction to the FHIR Genomics components included in FHIR R4 and the upcoming Genomics Reporting Implementation Guide. It will also cover Clinical Genomics use cases and demo app building, including integration with sample patient data and genomics knowledge bases.

Next generation quality measurement with FHIR

BEN HAMLIN  SAM SAYER
9:15 - 9:55 am | Rainier

Track: Quality Measures
Type: Tutorial

Introductory Level
Beginner to intermediate. Basic familiarity with HL7 standards necessary, expert knowledge of quality measurement not required.

Target audience: Those interested in deploying/implementing next generation measures specified using FHIR and CQL

This session will introduce the quality measure standards landscape including Fast Healthcare Interoperability Resources (FHIR) and Clinical Quality Language (CQL). It will also detail data model standards and how their use in FHIR-CQL measure specifications has initiated a renaissance in quality measurement that is altering perceptions of healthcare quality. We will be using several examples of next-generation measures to demonstrate the transformation of quality measures into decision support applications, and how FHIR supports streamlined API-based reporting.

Flicker or Bonfire - How design choices affect FHIR’s power

LLOYD MCKENZIE
9:15 - 9:55 am | St. Helens

Track: Special Topics
Type: Tutorial

FHIR is very popular because of its promise of faster/cheaper/more interoperable. In addition, FHIR provides several design options to ensure that it can be used in the broadest possible group of settings. However, the design choices you make can make a significant difference around how much of the faster/cheaper/more interoperable promise will actually be delivered. Furthermore, sometimes the FHIR solution that’s fastest/cheapest for the one writing a FHIR specification isn’t necessarily fastest/cheapest/most interoperable for the community at large. The presenter will identify design choices that can undercut FHIR’s power and describe the alternatives that may take more work or require a shift in thinking up front, but will lower costs and increase uptake in the long term.

Opening Startup Track

VADIM PERETOKIN
9:15 - 9:55 am | Lassen

Track: Startup Track

Target audience: Startup attendees

Delegates participating in the Startup Track will be welcomed to the HL7 FHIR DevDays.

Storage and analytics

NIKOLAI RYZHIKOV
9:15 - 9:55 am | Baker

Track: Quality Measures
Type: Tutorial

Advanced Level

Target audience: Software and data engineers

Implementers are faced with two important questions when they begin working on a FHIR-based system. They are: How should the FHIR resources be stored in the database? How should FHIR data be used for analytics and data mining? This session will provide an overview of options as well as highlight the trade-offs that accompany different solutions. It will also cover storage and analytics tracks as well as SQL and FHIR specifications. It will demonstrate how the opensource fhirbase database leverages both SQL and FHIR together in real-time.

Let’s build! Next Generation Quality Reporting with FHIR

JAMES AGNEW  BRYN RHODES
9:15 - 9:55 am | Hood

Track: Policy
Type: Let’s build!

Level: Intermediate to Advanced. This session will be digging in to reference implementations to build and run quality measures.

Target audience: Healthcare systems integrators, quality measurement and reporting vendors and consumers

This session will build running examples of quality measures specified using FHIR and CQL, exploring implementation challenges and surveying the landscape of tools and techniques currently available. We will build off the examples presented in the Next Generation Quality Measurement with FHIR session, exploring novel ways to use the data made available by the improved interoperability landscape of FHIR to advance healthcare quality measurement.

How and when to use FHIR Terminology Service APIs

JIM STEEL
9:15 - 9:55 am | Hood

Track: Terminology
Type: Tutorial

Target audience: Architects, front-end developers, data analysts, server developers, IG/profile authors

This talk will present the FHIR Terminology Service, beginning with the different usage scenarios for implementing it – from clinical data entry, to analytics, to authoring your own terminology resources. This includes defining terminology bindings for profiles and implementation guides as well as integrating terminology when building other kinds of FHIR servers. The session will also cover the different sections of the Terminology API, and how they can be used to help you solve these problems. Finally, it will also review some of the governance issues you should consider.

Interceptors and Subscriptions in HAPI FHIR

JAMES AGNEW  BRYN RHODES
10:30 - 11:10 am | St. Helens

Track: Building servers
Type: Tutorial

Advanced Level

HAPI FHIR 3.8.0 introduces some significant improvements in the way that event notification is done. This includes a brand new interceptor framework, as well as a newly rewritten subscription module. This tutorial explores both of these new features and covers how to get started with event notifications using either framework. It also covers built-in interceptors for security, authorization, productivity and more.
Learn how you can build a data provider for the FHIR Server for Azure to put a FHIR API over an existing data store.

JIM STEEL

10:30 - 11:10 am | Hood

Track: Terminology Service APIs

Target audience: Front-end developers, data analysts, IG/profile authors

This session will demonstrate how to use terminology service APIs to build sample tools for clinical data entry and data validation scenarios. It will also cover the process of defining your own terminology resources and mapping them to standard terminologies such as SNOMED CT and LOINC. The exercises will use HTML and Javascript, and CSIRO’s Ontoserver terminology server, but attendees are also welcome to use other languages and tools.

Let's build! My first profile

LILIAN MINNE
ARDON TOONSTRA
MICHEL RUTTEN

10:30 - 11:10 am | Baker

Track: Modeling

Type: Let’s build!

Introductory Level

This hands-on session provides attendees the opportunity to create their first FHIR profile and play with fixed values, cardinality, choice elements, value set bindings, slices and extensions. The instructors will also offer the opportunity to delve further into the topic on the creation of examples, value sets and other specific profiling questions.

Getting started with the common data model with OMOP on FHIR

DAVID YUE

11:20 am - 12:00 pm | Rainier

Track: Modeling

Type: Tutorial

Introductory Level

As the FHIR standard is becoming more prevalent in EHR interfaces, the ability to analyze data in a common format in a relational format will accelerate bridging data integration initiatives by using common terminologies. The objective of this tutorial is to walk through the developer workflow setup for the utilization of the GT-FHIR2 project from Georgia Tech. We will walk through common use cases and how to get a working environment up and running in a sandbox environment. Basic requirements will include an installation of Docker on the host machine to run containers, a REST client to communicate with the FHIR API server, and database client tools to perform CRUD operations on a relational database server hosted in Docker. We will traverse between example sets of resource mappings derived from FHIR DSTU2 to OMOP CDM v5 data structures.

Let’s build! CDS Hooks Services

DENNIS PATTERSON

11:20 am - 12:00 pm | St. Helens

Track: Clinical Decision Support

Type: Tutorial

Introductory Level

Come build decision support services to provide guidance within an EHR or other CDS Hooks client system. In this “Let’s build!” session, you will stand up your first CDS services and integrate with the public CDS Hooks sandbox. You’ll leave with a better understanding of the APIs involved as well as what to consider when building services for production.

Open mHealth (OmH) and FHIR

SIMONA CARINI
ERIC HAAS

11:20 am - 12:00 pm | Sonora

Track: FHIR standard

Type: Tutorial

Introductory Level

Open mHealth (OmH) provides open schemas for mobile health data (mHealth data), such as step count and blood glucose readings, to promote standardization and to make mHealth data more accessible. By combining OmH work with the FHIR API we are able to pull mHealth data from popular third-party APIs like Google Fit, FitBit, Apple Health and expose it to the FHIR ecosystem, where it can be accessed either in the native OmH schema format or as FHIR resources (typically FHIR Observations).

In this tutorial we will describe:

a) how mHealth data like step count from Google Fit or FitBit can be visualized as part of the normal EHR workflow using OmH standard and FHIR via a SMART-on-FHIR service to allow for the data to be fully integrated into a patient’s FHIR-based medical record.

b) the architecture used to capture the data from the mHealth apps and present it to a practitioner using OmH standards and FHIR.

c) mappings from OmH schemas to FHIR to allow the data to be fully integrated into a patient’s FHIR-based medical record.

Pop-up Sessions

Why stick to the regular schedule? If you have a great idea that you want to share or discuss with other participants or speakers, come over to the registration desk and we will make sure you get a room. Or if you already know, send us an email just prior to the event. Great ideas come before just good ideas.

hl7 fhir devdays 2019 | tuesday sessions

sessions | tuesday, june 11, 2019

how to add a fhir api to an existing database

john stairs

10:30 - 11:10 am | sonora

track: building servers

type: tutorial

security in fhir

andrew marcus

11:20 am - 12:00 pm | kodak

track: security

type: tutorial

introductory level

let's build! my first profile

lilian minne
ardin toonstra
michiel rutten

10:30 - 11:10 am | baker

track: modeling

type: let's build!

introductory level

getting started with the common data model with omop on fhir

david yue

11:20 am - 12:00 pm | rainier

track: modeling

type: tutorial

introductory level

let's build! cds hooks services

dennis pattereson

11:20 am - 12:00 pm | st. helens

track: clinical decision support

type: tutorial

introductory level

open mhealth (omh) and fhir

simona carini
eric haas

11:20 am - 12:00 pm | sonora

track: fhir standard

type: tutorial

introductory level

packages and versioning

martijn hartoorn

11:20 am - 12:00 pm | baker

track: fhir standard

type: tutorial

advanced level

target audience: tool builders, profilers, authors

everything that defines fhir can be found through a canonical url. while fhir was still a draft standard, this was good enough. however, with real collaboration emerging and multiple versions of the same conformance resources (structuredefinitions, extensions, value sets, etc) available as well as groups of resources that evolve together, the solution is packages. this tutorial will discuss how you can consume, create and publish packages as well as how a tooling ecosystem is emerging for packages.
A walk through the experiences, challenges and opportunities we met at DMI after deciding to use FHIR/VONK as technological basis for a large scale document management system.

Despite the best efforts of those of us working on interoperability, it is estimated that as much as 75% of American healthcare data is still exchanged by fax. Fax-On-FHIR is a proof of concept for a system that would use platforms like AWS and Twilio to extract usable information from this enormous stream of analog data without disrupting existing workflows or the overhead of building and deploying a separate application for handling faxes.

Let’s build! Capture the Flag – hacking a FHIR server

This session will build on morning’s security session by diving deeper into the scenario and let you play the role of the hacker. You will be provided with a VM loaded with hacking tools to install on your laptop. Asymmetrix’s cyber-security experts will then guide you as you identify and exploit vulnerabilities, looking at many attack vectors and techniques that can be used against insufficiently-secure FHIR infrastructure. This will help you gain a better understanding of each of the attacks and how they work.

Managing patient merge

Merging and linking duplicate patient records (and undoing that) is a running challenge for healthcare. This session will cover the existing features that support managing patient registration and identify what remains to be done. Finally, the instructor will facilitate a discussion about where the community might go with this in Release 5 of the FHIR standard.

Trial Site to Sponsor Lab Data exchange with HL7 FHIR

The HL7 Lab Data Implementation Guide (IG), to be submitted for approval in the September ballot, specifies how to extract FHIR resource data and map it to CDISC variables. We will present a high level summary of the IG, explain how it fits into the larger goal of using FHIR data in clinical research, and discuss how to use the proposed FHIR-to-CDISC mappings in solution development.

Using LOINC with FHIR

FHIR and LOINC go together like chips and salsa! FHIR’s standardized resources and API are the perfect delivery vehicle for clinical data coded with LOINC, the freely available international vocabulary standard for identifying health measurements, observations and documents. LOINC is now ubiquitous in health data systems worldwide and is an essential ingredient of system interoperability. In this session, we’ll get acquainted with the basics of LOINC, tour the common FHIR resources where you can make use of LOINC coded health data, and explore how to use the main FHIR terminology resources to interact with the LOINC terminology.

Keynotes

GREG SIMON
DANA LEWIS

1:15 - 2:00 pm | Hood
Plenary Session
Target audience: All participants
1:15 pm: Greg Simon, Biden Cancer Initiative
The Biden Cancer Initiative: creating the cancer research and care system you think we already have
1:40 pm: Dana Lewis, openAPS #WeAreNotWaiting: Open Source, Interoperability, and the Future of Healthcare
What happens when an open source community develops around a group of patients who are frustrated with their medical devices? You end up with an artificial pancreas (of course), Dana Lewis, a founder of the open source artificial pancreas (OpenAPS) movement, discusses open source innovation in unexpected places and the challenges and opportunities of interoperability in healthcare.
The SMART framework opens new avenues for layering applications within an EHR host, and CDS Hooks provides intelligent triggers for host-to-app communications. However, a few gaps still remain: how can apps communicate back to their hosts, and what options do they have to make intelligent recommendations? In this session, we will propose a technical pattern for answering both of those questions: Hooks with SMART messaging.

Lauren Cairco Dukes, Verily

When a clinician has to do an initial inpatient chart review, it can be difficult to pull together all the information needed to understand how a patient’s condition has changed over time. Verily collaborated with Boston Children’s Hospital’s Innovation and Digital Health Accelerator to create MedTimeline, an open-source SMART on FHIR app for Cerner Powerchart. The app plots patient datastreams as charts over time. We will share our experience in working with clinicians throughout development, as well as the surprises and challenges we encountered as we worked through the technical and clinical process barriers to launch into a hospital setting.
SESSIONS | WEDNESDAY, JUNE 12, 2019

Opening

EWOUT KRAMER
8:30 - 8:50 am | Kodiak
Plenary Session
Target audience: All participants
Ewout will make opening remarks.

Vendor Neutral Apps & EHR App Stores

ABIGAIL WATSON
9:00 - 9:40 am | Kodiak
Track: Building clients
Type: Tutorial
Introductory Level
Join us for an informal discussion of what development teams need to plan for when they develop vendor-neutral apps for deployment into multiple app stores. We'll look at the current ecosystem of stores, regulatory considerations, economics and give special consideration to MACRA and value-based care apps, as well as patient advocacy apps that fall under the 21st Century Cures Act anti-datablocking rule.

FHIRcast

ISAAC VETTER
9:00 - 9:40 am | Rainier
Track: Developer
Type: Tutorial
Introductory Level
FHIRcast synchronizes healthcare applications in real time to show the same clinical content to a common user. FHIRcast is a fledgling, modern, simple application context synchronization spec. It’s built on top of the SMART app launch protocol to enable rich integration between full-featured healthcare applications. Modeled after the common webhook design pattern and specifically the W3C WEBSUB RFC, FHIRcast naturally extends the SMART on FHIR launch protocol to achieve tight integration between disparate, full-featured applications.

Attend and learn how to use the opensource sandbox and how to build your own FHIRcase implementation.

Using Terminology Services - Further steps

ROBERT HAUSAM
9:00 - 9:40 am | Baker
Track: Terminology
Type: Tutorial
Advanced Level
Target audience: Terminology server and terminology client developers and implementers who are interested in improving the performance or expanding the capabilities of their use of terminology services

Using Terminology Services - Further Steps: How (and Why) Would I Use $find-matches and $closure?
The FHIR Terminology Service operations $expand, $validate-code, $lookup, $subsumes and $translate are fairly widely used and understood. But there are two additional terminology service operations that, while powerful and potentially quite useful, have received much less attention and use than the others and are generally not well understood – $find-match- es and $closure. The idea of $find-matches (formerly named $compose) is to take a set of properties (and potentially text) and look for and return one or more possible matching codes in the specified code system. The idea of $closure is to support the creation and ongoing maintenance of a client-side transitive closure table. In this tutorial, we will further explore the rationale, details and how to understand these operations. Rob also offers suggestions on how you may want to use them in your applications. Demonstrations and exercises will be provided for further hands-on exploration.

A computable guideline in FHIR: Opioid Prescribing Support

BRYN RHODES
9:00 - 9:40 am | Hood
Track: Clinical Decision Support
Type: Tutorial
Target audience: Developers

The ability of healthcare IT systems to react quickly and effectively to emerging public health concerns is a significant challenge. This session will look at how the FHIR Clinical Reasoning module is being used by the CDC to represent computable guideline recommendations for Opioid Prescribing Support.

Subscriptions on FHIR

JENNY SYED
10:15 - 10:55 am | Kodiak
Track: Developer
Type: Tutorial
The subscription resource in FHIR is now more mature, but there are still some gaps. Learn about the basic flow of a subscription, gotchas, and the outstanding questions that have been raised by the community.

FHIR in Population Health Ecosystem

JOHN LOONSK
10:15 - 10:55 am | Rainier
Track: Public Health
Type: Let’s build!
Target audience: Developers, architects, data requestors, project leads

In this two part tutorial, using the backdrop of population health, learn how to leverage the FHIR ecosystem for delivering privacy protecting capabilities and aggregating population health data. In the first half of the session, attendees will review the technical underpinnings of implementing privacy capabilities using FHIR to support limited data set, de-identified data while maintaining patient re-linking (with pseudonymization), record deduplication and distributed record linking (with irreversible hashing). As suggested in the GDPR, these privacy-protecting technologies can be used proactively to enhance privacy beyond encryption.

In the second half of this tutorial, in the context of hospitalized flu and respiratory syncytial virus (RSV) surveillance activity, learn how to ingest FHIR streams of data along with legacy Version 2 (V2) messages into your population/public health enterprise data. Learn to use FHIR Bulk Data API along with FHIR Terminology resources to acquire, manage, and disseminate your population/public health data. Develop an understanding in designing FHIR data storage and data stewardship architectures internally for your organization.

Methods for transforming content from V2 and CDA to FHIR and vice versa

GRAHAME GRIEVE
10:15 - 10:55 am | St. Helens
Track: Mapping
Type: Tutorial
Introductory Level
Almost everyone implementing FHIR starts with information that already exists in another format; this information must be converted to (and from) the FHIR resource format. Of particular interest to the HL7 community is content in V2 messages and Clinical Document Architecture (CDA) documents. Grahame will describe the facilities built into FHIR that can be used to convert between the formats, and also look at other tools and community projects that do the same. Mantra: mapping should not be a solitary activity.

Pop-up Sessions

Why stick to the regular schedule? If you have a great idea that you want to share or discuss with other participants or speakers, come over to the registration desk and we will make sure you get a room. Or if you already know, send us an email just prior to the event. Great ideas come before just good ideas.
This talk will cover the approach and lessons learned in working with clinical experts to define a FHIR-based model for essential cancer data. The goal is to establish systems that result in collection and sharing of high-quality data that can drive evidence-based treatment. Ultimately, information gathered from each cancer patient will effectively contribute to improving care for all future cancer patients. Under the leadership of the American Society of Clinical Oncology, a committee of leading clinical experts in oncology has identified and developed a specific set of common core data elements for cancer to be structured and standardized. Mark will show how that information has been developed into a FHIR-based model, the minimal Common Oncology Data Elements (mCOODE), including elements such as staging, progression, treatment, biomarkers, and toxicities. The session will cover how applications based on that model are being deployed at clinical sites that help cancer patients decide their treatments. It will also discuss techniques and tooling that will help scale this approach to other medical specialty areas.

This session is comprised of a series of eight-minute introductory talks that each cover a tool or toolkit (commercial, open-source, or otherwise) which may ease the life of FHIR implementers.

1. FHIR API Sandbox
   Track: developer
   Type: tutorial
   Target audience: healthcare systems
   How do we move beyond a “core data set,” giving consumer apps the power to securely access diverse health data stored in disparate back-end systems? We’ll take imaging data as a case study, showing a technical architecture that allows a client to register with a single institutional endpoint and request authorization to connect with multiple FHIR servers (e.g., a clinical data server and an imaging data server). We’ll demonstrate an open source reference architecture, explore challenges for client and server developers, and review a set of OAuth-based specifications to enable this kind of rich ecosystem. Topics will include dynamic client registration, PKCE, App-Claimed https URLs, token introspection and token exchange.

2. Trifolia-on-FHIR
   Track: community
   Type: tutorial
   Target audience: developers (intermediate users)
   Vonk FHIR Server can expose data from your existing system as FHIR resources. This session will teach you how to build a plugin to make that work. We’ll use an example legacy system and build a Facade on top of it. This includes mapping data to FHIR resources and mapping search parameters to queries to the legacy system.

3. Trifolia-on-FHIR
   Track: community
   Type: tutorial
   Target audience: developers
   Trifolia on FHIR is a new open source tool for authoring and publishing FHIR implementation guides.
**A POETIC approach to Solving FHIR’s Dynamic Application Registration challenge**

**MARK SCRIMSHIRE**
11:55 am - 12:35 pm | Rainier

Target audience: Developers FHIR, API publishers

Registering applications with OAuth protected endpoints is a manual grind. What if we could enable dynamic registration with confidence by acting as a community to certify applications. Hear how the CMS Blue Button 2.0 team has worked with developers to create a simplified, automated registration of certified consumer applications. Learn how a standards-based approach creates a win-win-win for developers, data holders and consumers by removing a major roadblock to consumer's access to their health data as impending regulations drive a dramatic proliferation of API endpoints.

**Validation of FHIR data**

**EWOUT KRAMER**
11:55 am - 12:35 pm | St. Helens

Track: Modeling
Type: Tutorial
Advanced Level

Target audience: Modelers & profile authors who want to understand about StructureDefinition

Are you a modeler or profile author? Do you use tools like forge but want to learn about how the mechanics behind validation and the StructureDefinition resource? In this tutorial, Ewout will show how familiar concepts translate into the StructureDefinition resource and how you can use validation tools to immediately try out the profiles you are creating.

**Let’s build! Health Records on iPhone**

**APPLE**
11:55 am - 12:35 pm | Kodiak

Track: Special Topics
Type: Let’s build!

Learn how to integrate the Health Records API into your health app on iOS. Discuss your apps and integrations with Apple engineers.

**FHIR projects**

**TRISTAN WILINSON**
Fei Wang
11:55 am - 12:35 pm | Hood

Track: Community
Type: Presentations

1. Preventing a Database Dumpster FHIR: Constraining Searches
Tristan Wilsonson, Redox

The FHIR specification is both very powerful and very open when it comes to search functionality. This forces server implementers to balance between dynamically supporting a robust FHIR search feature set with the need to constrain against performance degrading searches. Tristan will explore the following: different potential approaches for protecting a FHIR server while still dynamically handling varying search requests, discuss how those approaches could differ based on use cases, and raise the topic of how best practices could be defined around all of this to further the cause of interoperability through FHIR.

2. Handling application and user context in the Iglia EHR development platform
Fei Wang, Partners HealthCare

Partners HealthCare, in collaboration with Persistent Systems Inc., has developed iglia, an open source EHR development platform, built to lower the cost of building enterprise-grade clinical applications. This talk will demonstrate the main platform components and do a deep dive into how we handle application and user context, for example, launching EHR-agnostic applications in standalone mode using open source identity and access management tools.

**Keynotes**

**PETER LEE**
JUDY W. GICHOYA
1:45 - 2:30 pm | Kodiak

Plenary Session
Target audience: All participants

1:45 pm: Peter Lee, Microsoft
Reimagining Healthcare

The infrastructure of healthcare is moving to the cloud. This is a shift that will be truly historic, not only because it will happen only once, but because it may finally enable the interoperable, accessible, and AI-powered healthcare delivery platform that has been promised for so many years. However, as with other technology shifts, sometimes best intentions fail and data ends up in a maze of twisty little data silos – different silos than today’s, but fundamentally no better. This talk explores what is at stake, and suggests some specific interventions that developers can make today to ensure a better healthcare future.

2:10 pm: Judy W. Gichoya, Dotter Institute
Bridging the gap - FHIRed for Global Health Informatics

Judy will share her experience on how global health solutions are using FHIR - in her case building web components to lower the barrier of entry for resource limited settings to programming, and also for integration by sharing how they developed a point of care system to consume radiology text collected from a mobile Xray truck in Western Kenya.

At the end of the talk you will have an appreciation of global health informatics opportunities , with an opportunity to share and learn from the two use cases where FHIR is used to bridge a technical gap, but also resource gap.

**FHIR Bulk Data API**

**DAN GOTTLIEB**
2:40 - 3:20 pm | Kodiak

Track: Developer
Type: Tutorial

Target audience: Beginner to intermediate audience with interest in implementing or using open standards to export and import population level FHIR data from clinical systems, payment systems, and data warehouses.

Healthcare organizations have many reasons for bulk-data export, such as populating a data warehouse for operational or clinical analytics, leveraging population health and decision support tools from external vendors, and submitting data to registries and regulatory agencies. Today, bulk export is often accomplished with proprietary pipelines, and data transfer operations frequently involve an engineering and field mapping project. Learn about an exciting new effort by SMART and HL7 to bring the FHIR standard to bear on these challenges of bulk-data export.

**Take your app up a notch**

**JENNI SYED**
2:40 - 3:20 pm | Rainier

Track: Building clients
Type: Tutorial

Learn about the best practices that your app may be missing, but that can make your SMART on FHIR application easier to use and maintain. The information learned in this tutorial is applicable regardless of the FHIR server your applications will be running against.
Let's build! A FHIR sandbox in 30 minutes

MICHAEL HANSEN
2:40 - 3:20 pm | St. Helens
Track: Building servers
Type: Let's build!
Target audience: Developers

A FHIR server is just an API. Developing FHIR applications involves several other software components that need to be deployed and configured correctly. There are public sandboxes available, but a developer may want to modify the sandbox components to test a certain scenario. In this presentation, we will look at how cloud platform components can be combined to build a small FHIR sandbox from scratch. We will also introduce components that facilitate data exploration and ingestion. The session will build confidence that a sandbox can be built from scratch and point to ready to consume components that will allow deployment in minutes.

Repeated session
2:40 - 3:20 pm | Lassen
This slot is reserved for a session which will be repeated. The session will be announced on the screens in the hallway.

Let's build! Search in FHIR

ALEXANDER ZAUTKE
2:40 - 3:20 pm | Baker
Track: Building servers
Type: Let's build!
Advanced Level
Target audience: Analysts, developers (intermediate users)

Since the beginning of FHIR, there existed an official way of searching in FHIR resources. Using the RESTful API, specific information can be requested in a fine-granular way from a FHIR server. This Let's build session will give a practical walkthrough covering the following topics:
• Introduction to using search parameters
• Applying search modifiers
• How to create custom search parameters
• Advanced search concepts like reverse chaining and _filter expressions.

FHIR projects

SPEAKERS TO BE ANNOUNCED
2:40 - 3:20 pm | Hood
Track: Community
Type: Presentations

This session consists of two community presentations, which focus on the implementation best practices of their project/product. These presentations are NOT a product showcase. Each presentation will feature a five minute introduction of the product/project, followed by a deep dive into topics like the architectural approach, tools used, good/bad experiences with FHIR. The aim is for software implementers (even if they’re not using the same architecture nor development platform) to learn from the development approach as used in other projects.

Closing Keynotes

GRAHAME GRIEVE
3:30 - 3:50 pm | Kodiak
Plenary Session
Target audience: All participants

The closing remarks summarize HL7 FHIR DevDays and the overall state of the FHIR Community and where we are going.

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FHIR Products & Services

- **Simplifier.net**: Simplifier.net is the FHIR collaboration platform. Upload, manage and share FHIR profiles and Implementation Guides.
- **Forge**: Forge is the official FHIR tool for managing conformance resources (“FHIR Profiles”). Free download.
- **VONK**: VONK is the .NET FHIR Server for production purposes.
- **FHIR-API**: The official .NET API for FHIR. Available on GitHub and NuGet.

Firely’s FHIR services

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