Record Lifecycle Events on FHIR
W5 Analysis and Recommendations for FHIR DSTU-2.1

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Key Links

- **FHIR W5 Report – Current Build**
  - [http://hl7-fhir.github.io/w5.html](http://hl7-fhir.github.io/w5.html)

- **FHIR DSTU-2 – EHR-S Record Lifecycle Event Implementation Guide**
  - [http://hl7.org/fhir/ehrsrle/ehrsrle.html](http://hl7.org/fhir/ehrsrle/ehrsrle.html)

- **FHIR Connectathon 10**
  - EHR Record Lifecycle Architecture (Track 4)
  - 3-4 October 2015, HL7 Atlanta

- **RLE on FHIR Materials – HL7 EHR Interop Wiki:**
## Mapping to FHIR

<table>
<thead>
<tr>
<th>Requirements</th>
<th>Are Fulfilled by…</th>
</tr>
</thead>
<tbody>
<tr>
<td>ISO/HL7 10781 EHR-S FM R2 Record Infrastructure (RI) → 24(+3) Record Lifecycle Events</td>
<td>Implementable FHIR Resources</td>
</tr>
<tr>
<td>Basic Lifecycle Event</td>
<td>• AuditEvent</td>
</tr>
</tbody>
</table>
| Provenance Lifecycle Event when Record Entry content is **created** or **updated** | • AuditEvent  
• Provenance  
• Other new/updated resource(s) → corresponding to Action Taken |

↑ Resources may also be indivisibly and immutably bound by one or more digital signatures in a Record Entry.
• Actors take Actions
• Actors may be individuals, organizations and/or software/devices
• EHR and PHR Record Entries document (show evidence of) Actions Taken in health and healthcare
• Actions and Record Entries have separate (yet corresponding) sets of metadata
• Thus: Action W5 + Record Entry W5
# Action and Record Entry

## Action/Record Entry W5 Metadata

<table>
<thead>
<tr>
<th>Action</th>
<th>Record Entry</th>
</tr>
</thead>
</table>
| **Action W5:**  
Who/role – Action focus, subject, patient  
Who/role – Action performer, assistant, witness  
What – Action taken  
When – Action date/time/duration  
Where – Action physical location  
Why – Action rationale, purpose | **Record Entry W5:**  
Who/role – Entry target, subject, patient  
Who/role – Entry author, scribe, verifier, attester, witness…  
What – Entry Action: originate, update, verify, attest, exchange…  
When – Entry date/time  
Where – Entry device ID, network address  
Why – Entry rationale, purpose |

Expressed across all FHIR resources  
Fully Expressed in FHIR AuditEvent and Provenance resources when bound to other FHIR resources
### Action Metadata

### Abstract Attributes

<table>
<thead>
<tr>
<th>FHIR Resources</th>
</tr>
</thead>
<tbody>
<tr>
<td>CarePlan</td>
</tr>
<tr>
<td>Procedure</td>
</tr>
<tr>
<td>MedicationOrder</td>
</tr>
<tr>
<td>MedicationDispense</td>
</tr>
<tr>
<td>MedicationAdministration</td>
</tr>
<tr>
<td>Observation</td>
</tr>
<tr>
<td>DiagnosticOrder</td>
</tr>
<tr>
<td>DiagnosticResult</td>
</tr>
<tr>
<td>ImagingStudy</td>
</tr>
<tr>
<td>Specimen</td>
</tr>
<tr>
<td>FamilyHistory</td>
</tr>
<tr>
<td>Encounter</td>
</tr>
<tr>
<td>Appointment</td>
</tr>
<tr>
<td>And on across 90+ resources...</td>
</tr>
</tbody>
</table>

### Abstract Metadata Attributes for Action Taken

<table>
<thead>
<tr>
<th>Who</th>
<th>What</th>
<th>When</th>
<th>Where</th>
<th>Why</th>
</tr>
</thead>
</table>

Submitted with FHIR DSTU-2
GForge #6304
RLE on FHIR Project

W5 Recommendations

• Differentiate intent and outcome sections in Provenance

• Distinguish:
  – Action W5
  – Record Entry W5
W5 Recommendations

- Establish W5 elements in
  - AuditEvent as a base set, then
  - Select Provenance set, then
  - Select <any resource> set

- Ensure clear semantics of value sets
Encourage high degree of consistency of W5 element names, descriptions, data types, code/value sets
- Establishing consistent set of resource participants
- Minimizing need for a mapping table, such W5 Report
- Focus on code/value sets as separate step
W5 Recommendations

• Establish what could/may be “left behind” at the point of exchange
  – Yet preserving backward traceability

• Ensure W5 synchrony at same Action Instant (point in time)?
  – As captured in FHIR instance
  – Synchronous Snapshot to ensure we can actually track
    • Who did What, When, Where and Why
Use Cases

• FHIR RLE Use Cases to demonstrate use of
  – Audit log evidence (AuditEvent) and
  – EHR record entry evidence (Provenance bound to
    FHIR Action-related Resources) and
  – W5 metadata

• Security Audit – Glen Marshall

• Pharmacy Medication Tracking – Julia Chan