EHRS-FM R2 – Record Infrastructure

Record Entry Lifecycle Event Metadata on FHIR

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http://www.hl7.org/fhir

FHIR Resource Index

As of 1 August 2014

General:

- AdverseReaction
- AllergyIntolerance
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- Procedure
- Contraindication
- RiskAssessment

Medications:

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- MedicationAdministration
- MedicationDispense
- MedicationStatement
- Immunization
- ImmunizationRecommendation

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- DiagnosticOrder
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- Namespace

Now Underway

Mapping to FHIR

ISO/HL7 10781 EHR-S FM R2 Record Infrastructure (RI) → 24(+3) Record Lifecycle Events	FHIR Resources
Basic Lifecycle Event	• SecurityEvent
Provenance Lifecycle Event when Record Entry content is originated or updated	• SecurityEvent • 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 the Record Entry.

Best FHIR Resource for Record Lifecycle Metadata

SecurityEvent or ?

- At Issue: Our use of SecurityEvent
- HL7 Security WG Co-Chairs
  - Not anxious to overload FHIR SecurityEvent with Record Lifecycle metadata and pre/post data state details
- Previously at issue in EHR-S FM R2 Ballot
  - EHR WG agreed to separate Record Lifecycle Event metadata from System/Security metadata and move it from Trust Infrastructure (TI.2) to Record Infrastructure (RI.1.1.x.1)

Alternatives to SecurityEvent

- New LifecycleEvent or RecordEvent
  - Designed and instantiated entirely for Record Lifecycle Events
  - Extended from base set of SecurityEvent Attributes
- OR Profile of Core SecurityEvent
  - Also extended from base Attributes

Distinct SecurityEvent and LifecycleEvent

Possible Advantages

- Any implementation:
  - May instantiate one or both: SecurityEvent and/or LifecycleEvent
  - Base SecurityEvent and LifecycleEvent Attributes are identical and interchangeable
- Easy scope, differentiation of new Resource
  - Explicit: Name and focus on Record Lifecycle
  - Implicit: RM-ES
- Easy management
  - Security WG – FHIR SecurityEvent
  - EHR WG – FHIR LifecycleEvent
- Easy case for where Action and Record go!

EHR-S FM Record Lifecycle

Pre/Post Events 1-9

Pre Event State	Resource @ Event	Post Event State				
	SecurityEvent + Provenance	Added Event Evidence	Retained Pre Edition Unaltered	Added New Edition	Signed as Author	Signed as System
[none]	1 Originate/Retain	X		X	Opt	X
[Record Entry as persisted, indivisible and immutable since previous Lifecycle Event]	2 Amend	X	X	X	Opt	X
	3 Translate	X	X	X		X
	4 Attest	X	X		X	X
	5 Access/View	X				
	6 Output/Report	X				X
	7 Disclose	X				X
	8 Transmit	X				X
	9 Receive/Retain	X	X			

EHR-S FM Record Lifecycle

Pre/Post Events 10-18

Pre Event State	Resource @ Event	Post Event State				
	SecurityEvent + Provenance	Added Event Evidence	Retained Pre Edition Unaltered	Added New Edition	Signed as Author	Signed as System
[Record Entry as persisted, indivisible and immutable since previous Lifecycle Event]	10 De-Identify	X	X	X		X
	11 Pseudonymize	X				
	12 Re-Identify	X				
	13 Extract	X	X	X		X
	14 Archive	X				
	15 Restore	X				
	16 Destroy/Delete	X	[none]			
	17 Deprecate	X				
	18 Re-Activate	X				

EHR-S FM Record Lifecycle

Pre/Post Events 19-27

Pre Event State	Resource @ Event	Post Event State				
	SecurityEvent + Provenance	Added Event Evidence	Retained Pre Edition Unaltered	Added New Edition	Signed as Author	Signed as System
[Record Entry as persisted, indivisible and immutable since previous Lifecycle Event]	19 Merge	X	X	X		
	20 Unmerge	X				
	21 Link	X				
	22 Unlink	X				
	23 Add Legal Hold	X				
	24 Remove Legal Hold	X				
	25 Verify (new event)	X				
	26 Encrypt (new event)	X	X	?		
	27 Decrypt (new event)	X	X	?		

Record Entry Event Lifecycle

Pre/Post Entry Content w/FHIR

Starts at Point of Origination (Creation/Capture) as New Event

	Prior Event Added	During Interval between Events Retains (at rest): Indivisibly+Immutably	PRE	At New Event Adds	POST
Basic	1 SecurityEvent instance	1 or more SecurityEvent instances >> One per each prior Record Lifecycle Event	➔	1 SecurityEvent instance	*Becomes Prior Event*
w/Provenance	1 Provenance instance	1 or more Provenance instances >> One per each prior Record Lifecycle Provenance Event	➔	1 Provenance instance	
	1 or more other resource instance(s)	1 or more other FHIR resource instances > Corresponding to Action(s) Taken > As documented in Record Entry(ies)	➔	1 or more other resource instance(s)	

From ISO/HL7 10781 EHR-S FM – Sample Conformance Criteria

Originate/Retain Record Entry

RM-ES will vet Record Infrastructure (RI).

With Event Evidence (RI.1.1.1.1)➔
➔ At Lifecycle Event Occurrence (RI.1.1.1)

1. The system SHALL provide the ability to capture (originate) a Record Entry instance corresponding to an Action instance and context.
2. The system SHALL capture a unique instance identifier for each Record Entry.
3. The system SHALL capture the signature event (e.g., digital signature) of the origination entry Author, binding signature to Record Entry content.
4. The system SHALL provide the ability to capture both structured and unstructured content in Record Entries.
5. The system SHALL provide the ability to capture Record Entries from information recorded during system downtime.
6. The system SHOULD provide the ability to integrate Record Entries from Information recorded during system downtime.
7. The system SHALL provide the ability to capture date/time an Action was taken or data was collected if different than date/time of the Record Entry.
8. The system SHOULD capture metadata that identifies the source of non-originated Record Entry (e.g., templated, copied, duplicated, or boilerplate information).
9. The system MAY provide the ability to tag unstructured Record Entry content to organize it according to need, for example, in a time-related fashion or by application-specific groups (such as photographs, handwritten notes, or auditory sounds), or by order of relative importance.
10. The system MAY capture and maintain a Record Entry encoded as a standards-based data object (e.g., HL7 Continuity of Care, other HL7 CDA R2 Document, ISO 13606 artifact).
11. The system MAY capture and maintain a standards-based data object to mirror (be duplicate and synchronous with) internal Record Entry representation.

Fulfilled by FHIR Resource Implementation

Lifecycle Event Metadata (who, what, when, where, why)

Others to consider

1. The system SHALL audit each occurrence when a Record Entry is originated and retained.
2. The system SHALL capture identity of the organization where Record Entry content is originated.
3. The system SHALL capture identity of the patient who is subject of Record Entry content.
4. The system SHALL capture identity of the individual(s) who performed the Action documented in Record Entry content.
5. The system SHALL capture identity of the user who entered/authored Record Entry content.
6. The system SHALL capture identity of the system application which originated Record Entry content.
7. IF the source of Record Entry content is a device THEN the system SHALL capture identity of the device.
8. The system SHALL capture the Action as evidenced by Record Entry content.
9. The system SHALL capture the type of Record Event trigger (i.e., originate/retain).
10. The system SHALL capture date and time of Action occurrence as evidenced by Record Entry content.
11. The system SHALL capture date and time Record Entry content is originated.
12. The system MAY capture the duration of the Action evidenced by Record Entry content.
13. The system MAY capture the physical location of the Action evidenced by Record Entry content.
14. The system SHOULD capture identity of the location (i.e., network address) where Record Entry content is originated.
15. The system MAY capture the rationale for the Action evidenced by Record Entry content.
16. The system MAY capture the rationale for originating Record Entry content.
17. IF Record Entry content includes templates (boilerplate information) or copied (duplicated) information THEN the system SHOULD capture the source of such content.

Individuals have specific…

Action and Record Entry Roles

Action Roles	Record Entry Roles
• Subject • Performer • Witness	• Record Target • Author • Recorder • Attester • Informant

Example – Medication Order

Action and Record Entry Metadata

	Action Metadata	Record Entry Metadata
Who	Action Subject (Patient) Johnny Walker Role: Subject	Entry Subject (Patient) Johnny Walker Role: Record Target
	Action Organization Bay City Medical Center	
	Action Practitioner/ Performer (Order Placer) Doctor Sally Smith Role: Performer	Entry Source – Author or Scribe Nurse Janice Jones Role: Recorder
		Entry Source – System/Device Erstwhile EHR/Device XX123456

Example – Medication Order

Action and Record Entry Metadata

	Action Metadata	Record Entry Metadata
What	Action Taken Medication Order for Ambien 20mg PRN	Entry Origination/Retention (FHIR Resources related to Medication Order) SecurityEvent Provenance MedicationPrescription, et al
When	Action Date/Time 22 Aug 2014 @ 1800	Entry Date/Time 22 Aug 2014 @ 1810
	Action Duration 3 Minutes	
Where	Action Physical Location Ward/Room B/12	Entry Location – IP Address 255.255.255.1
Why	Action Reason/Purpose To Induce Sleep	Entry Reason/Purpose <n/a>

EHR-S FM Record Infrastructure (RI) – Lifecycle Events

More Evidentiary Metadata

Record Entry ID
Record Entry Content: Data, Document and/or Artifact ID(s)
Corresponding/linked Record Entry(ies)
Amendment/Translation Sequence
Pointer to Pre-Event Entry, if chained: e.g., pre-amendment, pre-translation
Source of Copied Content: e.g., via copy/paste, template or boilerplate
Event is known Disclosure
Permissions associated with Entry Content
Entry(ies) in Event Transaction: e.g., set of entries viewed, entries extracted, entries to be archived or deleted.
Digital signature(s)

Lifecycle Event Metadata

Who

Metadata	FHIR Resource	Resource Attribute(s)
Organization	Provenance	signature : string 0..1
	Provenance.Agent : 0..*	role : Coding 1..1 « ProvenanceAgentRole+ » type : Coding 1..1 « ProvenanceAgentType+ » reference : uri 1..1
Patient	Provenance	signature : string 0..1
	Provenance.Agent : 0..*	role : code 1..1 « ProvenanceEntityRole » type : Coding 1..1 « ProvenanceEntityType+ » reference : uri 1..1
	SecurityEvent.Participant : 1..*	role : CodeableConcept 0..* « DICOMRoleId+ » reference : Resource(Organization|Practitioner|Patient|Device) 0..1
Action - Performer	TBD	

For organizations and Patients, include Provenance.signature?
Need to distinguish Action from Record Metadata.
[See Medication Order Example]
Action-Performer not resolved.
Need to add RelatedPerson to Practitioner|Patient|Device choice (per Lloyd)?

Lifecycle Event Metadata

Who, con't

Metadata	FHIR Resource	Resource Attribute(s)
Record - Author/ User	Provenance	signature : string 0..1
	Provenance.Agent : 0..*	role : Coding 1..1 « ProvenanceAgentRole+ » type : Coding 1..1 « ProvenanceAgentType+ » reference : uri 1..1
	SecurityEvent.Participant : 1..*	role : CodeableConcept 0..* « DICOMRoleId+ » reference : Resource(Practitioner|Patient|Device) 0..1 userId : string 0..1
Record - System/Device	Provenance	signature : string 0..1
	Provenance.Agent : 0..*	role : Coding 1..1 « ProvenanceAgentRole+ » type : Coding 1..1 « ProvenanceAgentType+ » reference : uri 1..1
	SecurityEvent.Participant : 1..*	role : CodeableConcept 0..* « DICOMRoleId+ » reference : Resource(Practitioner|Patient|Device) 0..1 userId : string 0..1

Provenance.Agent.reference may resolve to a uri or Resource (like others)

Lifecycle Event Metadata

What

Metadata	FHIR Resource	Resource Attribute(s)
Action - Taken	TBD	
Record - Lifecyle Event	SecurityEvent.Event : 1..1	type : CodeableConcept 1..1 « SecurityEventType+ » subtype : CodeableConcept 0..* « SecurityEventSubType+ » action : code 0..1 « SecurityEventAction »
	SecurityEvent.Object : 0..*	identifier : Identifier 0..1 reference : Resource(Any) 0..1 type : code 0..1 « SecurityEventObjectType » role : code 0..1 « SecurityEventObjectRole » lifecycle : code 0..1 « SecurityEventObjectLifecycle »

Action Taken not resolved.
Action Taken = <set of resources>?
[See Medication Order Example <corresponding set of Med Order resources>]

Lifecycle Event Metadata

When

Metadata	FHIR Resource	Resource Attribute(s)
Action - Date/ Time	TBD	
Record - Date/ Time	Provenance	recorded : instant 1..1
	SecurityEvent.Event : 1..1	dateTime : instant 1..1
Action - Duration/ Elapsed Time	TBD	

Action Date/Time and Duration not resolved.

Lifecycle Event Metadata

Where

Metadata	FHIR Resource	Resource Attribute(s)
Action - Physical Location	TBD	
Record - Network Address	Provenance	location : Resource(Location) 0..1
	SecurityEvent.Participant.Network	identifier : string 0..1 type : code 0..1 « SecurityEventParticipantNetworkType »

Action Physical Location not resolved.
Add “location” to SecurityEvent.Event?

Lifecycle Event Metadata

Why

Metadata	FHIR Resource	Resource Attribute(s)
Action - Reason, Rationale, Purpose	TBD	
Record - Reason, Rationale, Purpose	Provenance	reason : CodeableConcept 0..1
	SecurityEvent.Event : 1..1	*reason : CodeableConcept 0..1*

Action Reason not resolved.
Add “reason” to SecurityEvent.Event?

Lifecycle Event Metadata

Evidentiary

Metadata	FHIR Resource	Resource Attribute(s)
Record Entry ID	SecurityEvent.Object : 0..*	identifier : Identifier 0..1 reference : Resource(Any) 0..1
Record Entry Content ID(s): data, documents, artifacts	SecurityEvent.Object : 0..*	identifier : Identifier 0..1 reference : Resource(Any) 0..1
Corresponding/ linked Record Entry(ies)	SecurityEvent.Object : 0..*	identifier : Identifier 0..1 reference : Resource(Any) 0..1
Amendment/ Translation Sequence	SecurityEvent.Object : 0..*	lifecycle : code 0..1 « SecurityEventObjectLifecycle »
Pointer to Pre-Event Entry, if chained	SecurityEvent.Object : 0..*	identifier : Identifier 0..1 reference : Resource(Any) 0..1

Lifecycle Event Metadata

Evidentiary, con't

Metadata	FHIR Resource	Resource Attribute(s)
Source of Copied Content	SecurityEvent.Object : 0..*	identifier : Identifier 0..1 reference : Resource(Any) 0..1 type : code 0..1 « SecurityEventObjectType » role : code 0..1 « SecurityEventObjectRole »
Event is known Disclosure	SecurityEvent.Object : 0..*	lifecycle : code 0..1 « SecurityEventObjectLifecycle », where lifecycle = "disclosure"
Record Entry Permissions	SecurityEvent.Participant : 1..*	role : CodeableConcept 0..* « DICOMRoleId+ » reference : Resource(Practitioner|Patient|Device) 0..1 userId : string 0..1
	SecurityEvent.Object : 0..*	sensitivity : code 0..1 «SecurityEvent.object.sensitivity »
Event Transaction Entry(ies)	SecurityEvent.Object : 0..*	identifier : Identifier 0..1 reference : Resource(Any) 0..1 type : code 0..1 « SecurityEventObjectType »

Source of copied content: e.g., via copy/paste, template, boilerplate?
What about context-based authorization/access control?

FHIR Resource

Provenance

Resource	Attribute	Description	Value Set
Provenance	➔	Who, What, When for a set of resources	
	target : Resource(Any) 1..*	Target resources (usually version specific)	
	period : Period 0..1	When the activity occurred	
	recorded : instant 1..1	When the activity was recorded/updated	
	location : Resource(Location) 0..1	Where the activity occurred, if relevant	
	reason : CodeableConcept 0..1	Reason activity is occurring	
	signature : string 0..1	Base64 signature (DigSig) - integrity check	

Create value set for “reason”? [Galen, Diana P-M]

FHIR Resource

Provenance.Agent

Resource	Attribute	Description	Value Set
Provenance.Agent	➔	Person, organization, records, etc. involved in creating resource	
	role : Coding 1..1 « ProvenanceAgentRole+ »		<confirm> Enterer, performer, author, verifier, attester, informant, source, cc, application, daemon
	type : Coding 1..1 « ProvenanceAgentType+ »		<confirm> Practitioner, organization, software, record, document
	reference : uri 1..1		

Provenance.Agent.reference may resolve to a uri or Resource (like others)
Review value sets for “role” and “type”.

FHIR Resource

SecurityEvent.Event

Resource	Attribute	Description	Value Set
SecurityEvent.Event	➔	What was done	
	type : CodeableConcept 1..1 « SecurityEventType+ »	Type/identifier of event	<confirm> Rest + DICOM codeset
	subtype : CodeableConcept 0..* « SecurityEventSubType+ »	More specific type/id for the event	<confirm> Read, vread, update, delete, validate, create, history-instance, history-type, history-system, search-type, search-system, transaction + DICOM codeset
	action : code 0..1 « SecurityEventAction »	Type of action performed during the event	<confirm> C) Create; R) Read/view/print; U) Update; D) Delete; E) Execute.
	dateTime : instant 1..1	Time when the event occurred on source	
	location : Resource(Location) 0..1	TBD	
	reason : CodeableConcept 0..1	TBD	TBD

Review value sets for “type”, “subtype” and “action”.
Add “location” and “reason” and value set for “reason”.

FHIR Resource

SecurityEvent.Source

Resource	Attribute	Description	Value Set
SecurityEvent.Source	➔	Application systems and processes	
	site	Logical source location within the enterprise	
	identifier	The id of source where event originated	
	type : CodeableConcept 1..1 « SecurityEventSourceType+ »	The type of source where event originated	<confirm> 1) User Device; 2) Data Interface; 3) Web Server; 4) Application Server; 5) Database Server; 6) Security Server Security server; 7) Network Device; 8)Network Router; 9) Other.
	location : Resource(Location) 0..1	TBD	

Why not “location” resource instead of site, identifier and type?
Review value set for “type”.

FHIR Resource

SecurityEvent.Object

Resource	Attribute	Description	Value Set
SecurityEvent.Object	➔	Specific instances of data or objects accessed	
	identifier : Identifier 0..1	Specific instance of object (e.g. versioned)	
	reference : Resource(Any) 0..1	Specific instance of resource (e.g. versioned)	
	type : code 0..1 « SecurityEventObjectType »	Object type being audited	<confirm> 1) Person; 2) System Object; 3) Organization; 4) Other.
	role : code 0..1 « SecurityEventObjectRole »	Functional application role of Object	<confirm> 1) patient; 2) location; 3) report; 4) resource; 5) master file; 6) user; 7) list; 8) doctor; 9) subscriber; 10) guarantor; 11) security user entity; 12) security user group; 13) security resource; 14) security granularity definition; 15) practitioner; 16) data destination; 17) data reposition; 18) schedule; 19) customer; 20) job; 21) job stream; 22) table; 23) routing criteria; 24) query.

Review value sets for “type” and “role”.

FHIR Resource

SecurityEvent.Object, con't

Resource	Attribute	Description	Value Set
SecurityEvent.Object	lifecycle : code 0..1 « SecurityEventObjectLifecycle »	Life-cycle stage for the object	<confirm> 1 OriginationCreation; 2) Import/ Copy from original; 3) Amendment; 4) Verification; 5) Translation; 6) Access/Use; 7) De-identification; 8) Aggregation, summarization, derivation; 9) Report; 10) Export/ Copy to target; 11) Disclosure; 12) Receipt of disclosure; 13) Archiving; 14) Logical deletion; 15) Permanent erasure/Physical destruction
	sensitivity : code 0..1 «SecurityEvent.object.sensitivity »	Policy-defined sensitivity for the object	<confirm> L) Low; M) Moderate; N) Normal; R) Restricted; U) Unrestricted; V) Very restricted.

Review value sets for "lifecycle" and "sensitivity".

FHIR Resource

SecurityEvent.Participant.Network

Resource	Attribute	Description	Value Set
SecurityEvent.Participant.Network	➔	Logical network location for application activity	
	identifier : string 0..1	Identifier for the network access point of a user device	
	type : code 0..1 « SecurityEventParticipantNetworkType »	The type of network access point	<confirm>

Review value set for “type”.

Record Entry and FHIR Resources

- An EHR System manages a persistent EHR comprising Record Entries for
  - one to many provider organizations,
  - one to many individual practitioners, and
  - one to many patients
- An EHR comprises
  - one to many Record Entry instances
- A Record Entry instance may comprise
  - one to many FHIR Resource instance(s)
  - with signature bindings

Project Focus/Success Criteria

FHIR Enabled Lifecycle Events

Project Focus	Success Criteria
Binds (joins) FHIR Resource Instance(s) together in Record Entry Instance: • Including applicable Clinical, Administrative, Infrastructure Resources • Based on Action(s) Taken	• Complete specification of baseline Set of FHIR Resources applicable at each Record Lifecycle Event (1-24) and captured in the resulting Record Entry Instance • Allowing additional Resources to be bound in a Record Entry Instance, per Clinical, Administration and/or other context
Includes Pre- and Post-Lifecycle Event Entry States • e.g., before/after amendment or translation	• Complete specification of how both pre- and post-lifecycle event states (of FHIR Resources) are captured and preserved in one or more Record Entries

Project Focus/Success Criteria

FHIR Enabled Lifecycle Events

Project Focus	Success Criteria
Includes Action/Event Metadata	• Complete specification of Action/Event Metadata (in FHIR Resources) per Record Entry
Includes Attestation and Content Binding • With/without Digital Signature	• Complete specification of: • Attestation and/or Digital Signature bound to Record Entry content

EHR Record Lifecycle/Lifespan

Dimensions of End-to-End Flow

Record Lifespan

1. Within Single System
   - Starting at point of origination, in Source System
   - Starting at point of receipt, in Receiving System
   - Ending at point of deletion
2. Across Multiple Systems
   - Starting at point of origination, in Source System
   - Traversing one or more Points of Exchange
   - Ending at point of deletion, in each System

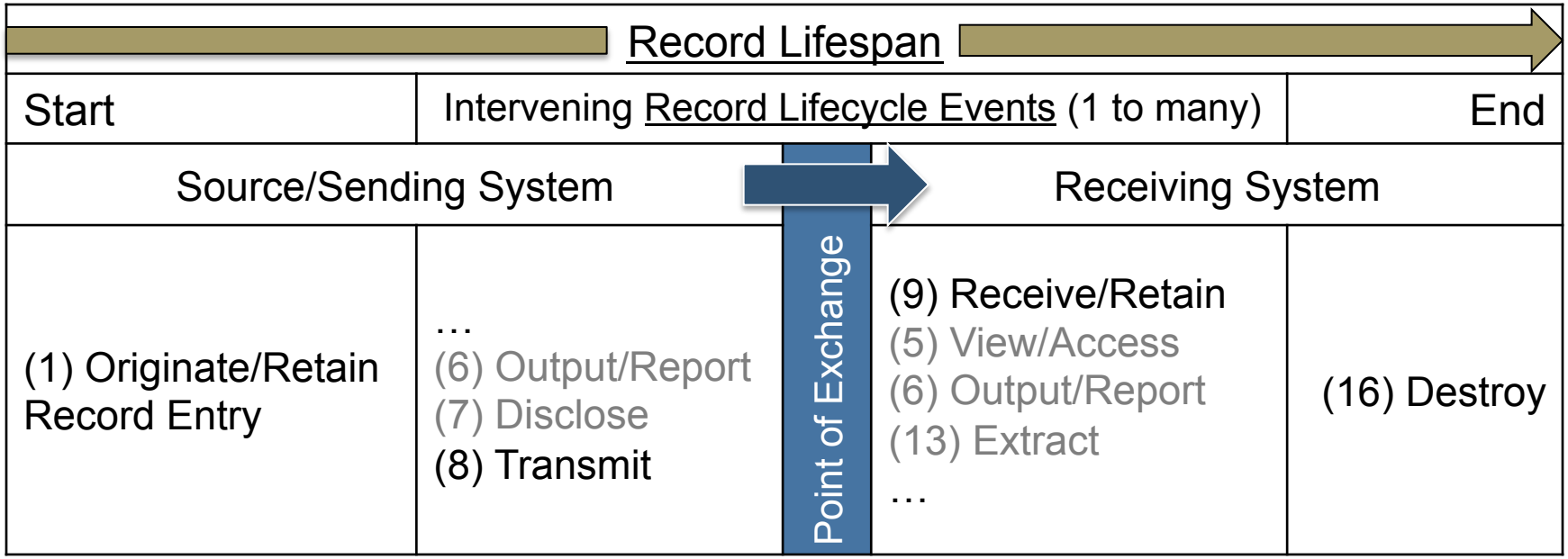
Record Lifespan – End-to-End

Within Single System

Record Lifespan		
Start	Intervening Record Lifecycle Events (0 to many)	End
Source System (1) Originate/ Retain Record Entry	(2) Amend (3) Translate (25,4) Verify, Attest (5) View/Access (6) Output/Report (7) Disclose (8) Transmit (10) De-Identify (11) Pseudo-nymize (12) Re-Identify (13) Extract (14,15) Archive, Restore (17,18) Deprecate/Retract, Re-Activate (19,20) Merge, Unmerge (21,22) Link, Unlink (23,24) Place, Remove Legal Hold (26,27) Encrypt, Decrypt	(16) Destroy
Receiving System (9) Receive/Retain Record Entry		(16) Destroy

Record Lifespan – End-to-End

Across Multiple Systems



Repeated at each point of exchange…

Current/Emerging Projects Related to…

EHR-S FM Record Infrastructure

- EHR Record Lifecycle Event Metadata using HL7 Fast Health Interoperable Resources (FHIR) – this project
- S&I Data Provenance
- S&I esMD
- S&I Simplification
  - S&I Use Case Requirements Analysis
  - Use Case Authoring Tool (UCAT) Development
- HL7 Functional Model Framework
  - Next Releases of EHR-S FM (R3), PHR-S FM (R2), Lab FM (?)
- HL7 Vocabulary Harmonization: EHR, Security, CBCC WGs
- Functional Profile Development: RM-ES R2, MU FP, PH FPs
- ISO 21089 Revision, Trusted End-to-End Information Flows
- ISO 13606 Revision, EHR Communication
- Others: HSPC?

ISO/HL7 Standard or S&I Activity → Vocabulary Alignment Underway: HL7 EHR, CBCC, Security WGs ↓ ↓ Record Lifecycle Event (EHR-S FM RI.1.1.x)		ISO 21089:2004 Trusted End2End Published TR	ISO 21089:2014 Trusted End2End In development	ISO/HL7 10781 EHRS FM R2:2014 Published	ISO/HL7 16527 PHRS FM R1:2014 Published	ISO/HL7 16527 PHRS FM R2 In development	ISO 19669 – Re-Usable Use Case In development	ISO 13606 – EHR Communication In Revision	HL7 EHR Lifecycle Model DSTU:2008 Published	HL7 RM-ES FP R1 2009 Published	HL7 RM-ES FP R2 In Development	HL7 Record Lifecycle on FHIR In Development	US S&I Simplification	US S&I Data Provenance
1 Originate/Retain Record Entry		X	X	X		X	X		X		X	X	X	TBD
2 Amend Record Entry		X	X	X		X	X		X		X	X	X	
3 Translate Record Entry		X	X	X		X	X		X		X	X	X	
4 Attest Record Entry			X	X		X	X		X		X	X	X	
5 View/Access Record Entry		X	X	X		X	X		X		X	X	X	
6 Output/Report Record Entry	Exchange	X	X	X		X	X	X	X		X	X	X	
7 Disclose Record Entry	Exchange	X	X	X		X	X	X	X		X	X	X	
8 Transmit Record Entry	Exchange	X	X	X		X	X	X	X		X	X	X	
9 Receive/Retain Record Entry	Exchange	X	X	X		X	X	X	X		X	X	X	
10 De-Identify Record Entry		X	X	X		X	X		X		X	X	X	
11 Pseudo-nymize Record Entry		X	X	X		X	X		X		X	X	X	
12 Re-Identify Record Entry		X	X	X		X	X		X		X	X	X	
13 Extract Record Entry		X	X	X		X	X		X		X	X	X	
14 Archive Record Entry		X	X	X		X	X		X		X	X	X	
15 Restore Record Entry			X	X		X	X		X		X	X	X	
16 Destroy Record Entry		X	X	X		X	X		X		X	X	X	
17 Deprecate/Retract Record Entry			X	X		X	X				X	X	X	
18 Re-Activate Record Entry			X	X		X	X				X	X	X	
19 Merge Record Entry			X	X		X	X				X	X	X	
20 Unmerge Record Entry			X	X		X	X				X	X	X	
21 Link Record Entry			X	X		X	X				X	X	X	
22 Unlink Record Entry			X	X		X	X				X	X	X	
23 Place Legal Hold on Record Entry			X	X		N/A	X				X	X	X	
24 Remove Legal Hold on Record Entry			X	X			X				X	X	X	
25 Verify Record Entry Content		X	X			X	X		X		X	X	X	
26 Encrypt Record Entry			X			X	X				X	X	X	
27 Decrypt Record Entry			X			X	X				X	X	X	
Applicable Lifecycle Events →		15	27	24	0	25	27	4	16	0	27	27	27	?

Longer Term…

Project Segments/Leads

		Leads
1	ISO/HL7 10781 EHR-S FM R2 RI – Record Infrastructure RM-ES – Records Management/ Evidentiary Support	Gary Dickinson, Reed Gelzer, MD, Josh Mandel, Diana Warner
2	TI – Trust Infrastructure	TBD
3	CP – Care Provision	TBD
4	CPS – Care Provision Support	TBD
5	AS – Administrative Support	TBD
6	POP – Population Health Support	TBD
7	ISO/HL7 16527 PHR-S FM R1 PH – Personal Health S – Supportive II – Information Infrastructure	John Ritter, et al.

Links

- HL7 EHR Interop Wiki:
  - http://wiki.hl7.org/index.php?title=EHR_Interoperability_WG