

HL7 EHR Working Group EHR Interoperability WG

15 September 2008

Gary L. Dickinson, Facilitator

EHR Interoperability Work Group

Areas of Focus

- “Coming to Terms” White Paper
 - Compilation and Analysis of Industry “Interoperability” Definitions
- EHR Interoperability Model (EHR/IM) DSTU
 - Characteristics of Interoperable EHR Records
- EHR/IM - CDAR2 Reference Profile for EHR Interoperability DSTU
- EHR/IM - Legal Profile
 - Alignment with RM/ES Functional Profile

EHR Interoperability Work Group

Areas of Focus, con't

- EHR Lifecycle Model (EHR/LM) DSTU
 - EHR Lifecycle Events
- ANSI HITSP Privacy Foundation
 - Key Privacy Principles and their intersection with EHR Lifecycle Events
- ANSI HITSP Security Foundation
- ONC/AHIC/HITSP Use Case Alignment
 - w/HL7 EHR/PHR Models

Interoperability Definition

HL7

- “Interoperability is the ability of two or more systems or components to exchange information and to use the information that has been exchanged.
 - “Functional’ interoperability is the capability to reliably exchange information without error.
 - “Semantic’ interoperability is the ability to interpret, and, therefore, to make effective use of the information so exchanged.”

Compilation and Analysis of Industry Interoperability Definitions

- Lead: Pat Gibbons, Mayo Clinic
- Research/Reference/Foundation Project
- Compilation and Analysis
 - 100+ Definitions
 - Many sources, US and international, including HL7, ISO, IEEE, NAHIT, US Executive Order...

Compilation and Analysis

Key Aspects of Interoperability

- Technical Interoperability
 - Structure, syntax, reliable communication
- Semantic Interoperability
 - Meaning, intent and context preserved
- Process Interoperability
 - Integral to the process of health(care) delivery

Compilation and Analysis Status

- “Coming to Terms” White Paper
 - Assessment and Findings
- Publication Package
 - White Paper & Slide Set Overview
 - Reference Spreadsheets
 - Source Summary and Acronyms
- Available on HL7 EHR TC Website
 - <http://www.hl7.org/ehr>

- To the question:
“What is Interoperability?”
 - “Coming to Terms” White Paper
- To the point:
“What is EHR Interoperability?”
 - HL7 EHR Interoperability Model DSTU
 - HL7 EHR Lifecycle Model DSTU

HL7 EHR Working Group

4 Complementary Models

- EHR System Functional Model
- PHR System Functional Model
- EHR Interoperability Model
- EHR Lifecycle Model

- Each specifies:
 - Requirements
 - Testable conformance criteria

Complementary EHR/EHRS/PHRS Models Overview

	EHR System Functional Model (EHRS/FM)	PHR System Functional Model (PHRS/FM)	EHR Interoperability Model (EHR/IM)	EHR Lifecycle Model (EHR/LM)
Focus	Functions of <u>EHR Systems</u>	Functions of <u>PHR Systems</u>	Characteristics of Interoperable <u>EHR Records</u>	Key Audit/Trace Events in <u>EHR Record Lifecycle</u>
Specifies	~150 Functions	~100 Functions	~100 Characteristics	16 Events
Status	<ul style="list-style-type: none"> • HL7 Normative • ANSI Approved • ISO DIS Ballot 	<ul style="list-style-type: none"> • HL7 DSTU 	<ul style="list-style-type: none"> • HL7 DSTU • 2009: Normative 	<ul style="list-style-type: none"> • HL7 DSTU

EHR Interoperability Model

- Lead
 - Gary L. Dickinson
 - Consultant, representing CentriHealth
- DSTU Release 1
 - Passed Ballot, January 2007
 - Published, March 2007
- Available
 - <http://www.hl7.org/ehr>

EHR Interoperability Model

What is It?

- A consensus Draft Standard for Trial Use
- A common industry reference point
- A set of characteristics of (requirements for) interoperable EHRs, encompassing
 - WHAT (EHR Interoperability Characteristics) and
 - WHY (Rationale) but
 - NOT HOW (Architectures and Implementations)
- A concrete approach to EHR interoperability: technical, semantic and process

EHR Interoperability Model

What is It? con't

- A set of benchmarks to achieve persistent legally qualified records
- A trust framework for key stakeholders
 - Patients/Consumers, Providers, Authors, Record Users...
- A structure to ensure record persistence and indelibility
 - End-to-end: point of record origination to each ultimate point of record access/use
 - Often traversing point-to-point record exchanges

EHR Interoperability Model

What is It? con't

- A context of the EHR as the immediate (concurrent) record of health(care)
 - Chronicle of health(care)
 - Documentation of health(care) Acts in Act Records
 - Creation of indelible Act Record entries in the persistent EHR

EHR Interoperability Model

What is It? con't

- An introduction of the Common EHR Unit of Record
 - An Act Record for each Act/Action
 - Sufficient to document all health(care) Acts
- A framework for Common Record Units (Act Records) to comprise the EHR

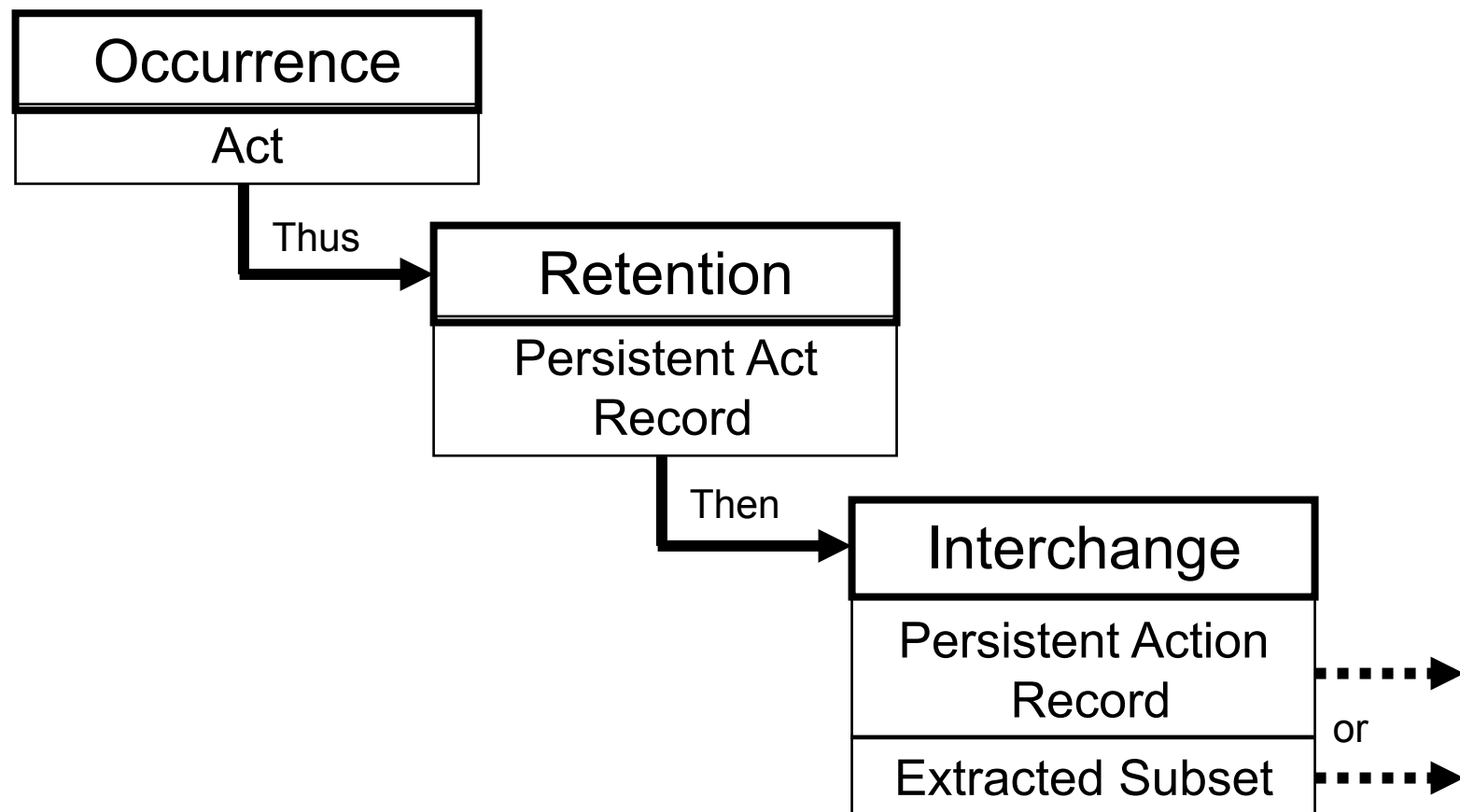
EHR Interoperability Model

What is It? con't

- A framework for conformance testing
 - Conformance criteria for record validation
 - Applicable to specific application roles
 - Record Source/Originator
 - Record Transmitter, Receiver
 - Interchange Mediator, Intermediary
- An approach which is technology and vendor neutral

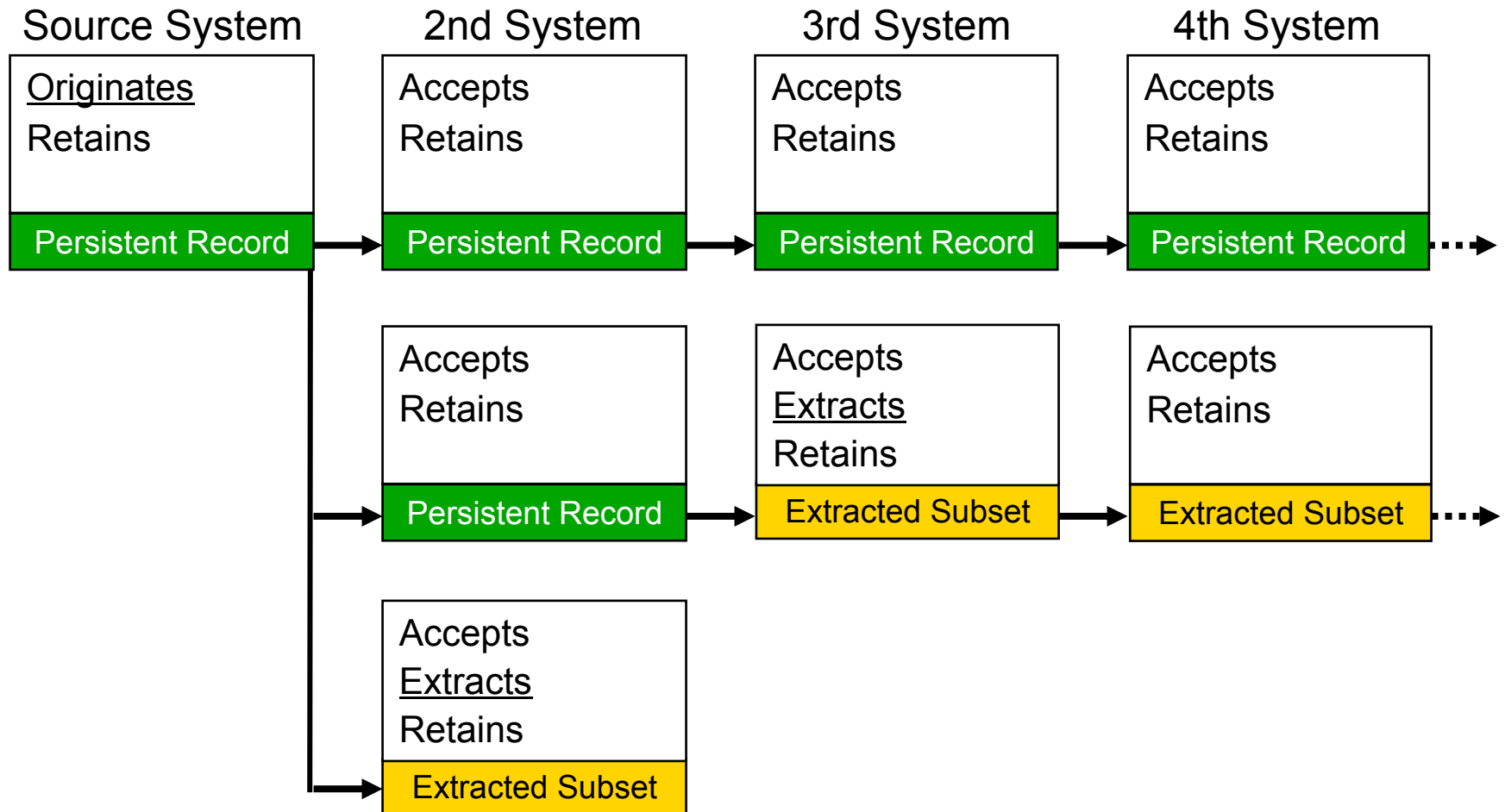
EHR Interoperability Model

Act/Act Record/Interchange



Example Interchange Pattern

Persistent Records and Extracted Subsets



EHR Interoperability Model

Next Steps

- Review and revise draft
 - Parking lot issues
- Prepare for public comment period
- Capture input and revise model
- Prepare draft for normative ballot

- Volunteers Welcome!!

EHR Lifecycle Model

- Lead
 - Gary L. Dickinson
- Draft Standard for Trial Use
 - Passed Ballot January 2008
 - Published March 2008

EHR Lifecycle Model

What is It?

- A common industry reference point
- A specification of lifecycle events for interoperable EHR records
- A framework for EHR record audit and traceability
- A supplement to the EHR Interoperability Model
 - Audit/trace points (per EHR/IM Section 3.19)

EHR Lifecycle Model

What is It? con't

- A structure to ensure record persistence and indelibility
- A framework for conformance testing
- An approach which is technology and vendor neutral

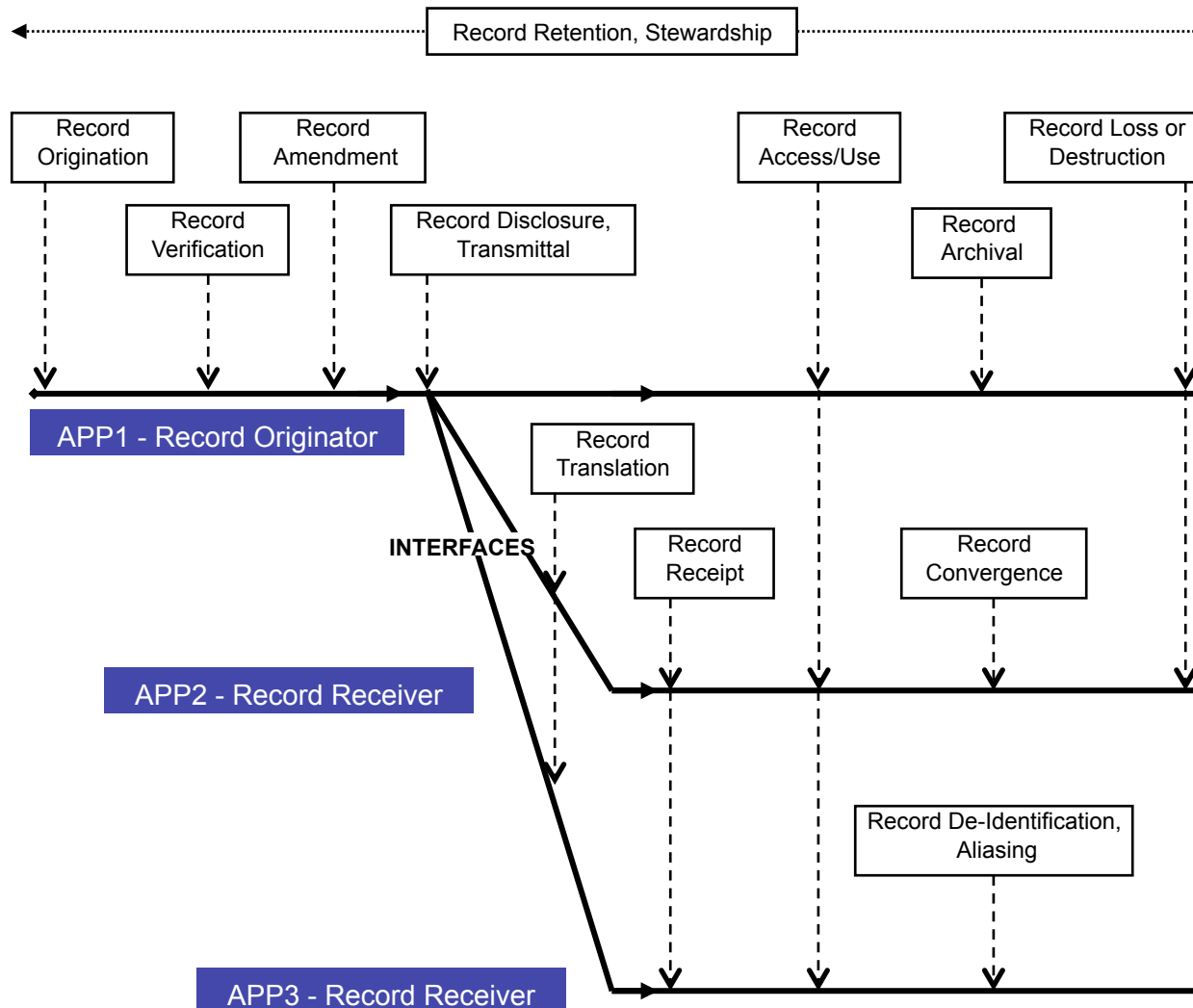
EHR Lifecycle Model

EHR Lifecycle Events

Occurring at Point of Record:

- Origination and Retention
- Amendment
- Verification
- Access, View
- Translation
 - Language and Coding/Classification Scheme
- Transmittal and Disclosure
- Receipt and Retention
- De-identification, Aliasing, Re-Identification
- Archival

ISO 21089 - Key Trace Points in End-to-End Information Flow



EHR Lifecycle Model

Next Steps

- Trial Use Period
- 2010: Normative Draft and Ballot

CDAr2 Reference Profile

- CDAr2 Reference Profile for EHR Interoperability
- Lead
 - Calvin Beebe, Mayo Clinic
 - Co-Chair, HL7 Structured Documents TC
- Draft Standard for Trial Use
 - Passed Ballot January 2008
 - Published March 2008

CDAr2 Reference Profile

What is It?

- A crosswalk of EHR/IM requirements vis-à-vis CDAr2 attributes
- A specification of CDAr2 as an implementation of the Common EHR Record Unit
 - Mapped to EHR/IM Sections 3&4
- A collaboration between HL7 WGs
 - EHR, Structured Documents, Security

CDAr2 Reference Profile

Now

- EHR Interoperability Requirements Fulfilled by CDAr2 attributes
 - Currently 51 of 56
- 5 Issues Under Review
 - Access Control, including Consent-Based
 - Record Audit
 - End-to-End Traceability

CDAr2 Reference Profile

Next Steps

- Resolution of 5 outstanding issues
 - In collaboration with HL7 Structured Documents and Security WGs
- Trial Use Period

EHR/IM Legal Record Profile

- Lead
 - Michelle Dougherty, AHIMA
 - Facilitator, EHR TC Legal Aspects WG

Legal Record Profile

What is It?

- An assessment of EHR Interoperability Model requirements applicable to a fully formed, legally qualified record
- An analysis of EHR meta-data requirements
 - Vis-à-vis RM/ES Functional Profile
- An exposition of coverage and gaps
- A validation/revision of current legal record profile
 - EHR/IM DSTU, Column G

Legal Record Profile

Next Steps

- Begin review
 - Separate profile from EHR/IM
 - Prepare draft for public review and comment
 - Capture input and revise
 - Prepare draft for profile ballot
-
- Volunteers Welcome!!

EHR Lifecycle Event Intersections

HITSP Privacy Foundation

- Lead
 - Gary Dickinson
- Initial Draft
 - Initial Draft - February 2008
 - Presented to
 - HITSP Foundations Committee
 - HITSP Security, Privacy and Infrastructure TC

EHR Lifecycle Event Intersections

What is It?

- Shows the intersection of key HITSP privacy principles (categories) and shows corresponding points in the EHR Record lifecycle where those principles might be engaged

EHR Lifecycle Event Intersections

Next Steps

- Now – Show intersections (“X”)
- Add HITSP Security Foundation
 - When available
- Next – Show what should actually happen at the intersections

ONC/AHIC/HITSP

Use Case Alignment Analysis

- Year 1 - Analysis Complete
 - Care Delivery - EHR/Lab Results Reporting
 - Consumer Empowerment - Demographics and Medication History
 - Population Health - Biosurveillance
- Year 2/3 - Analysis Underway
 - Quality Reporting
 - Remote Monitoring

Use Case Alignment

Leadership

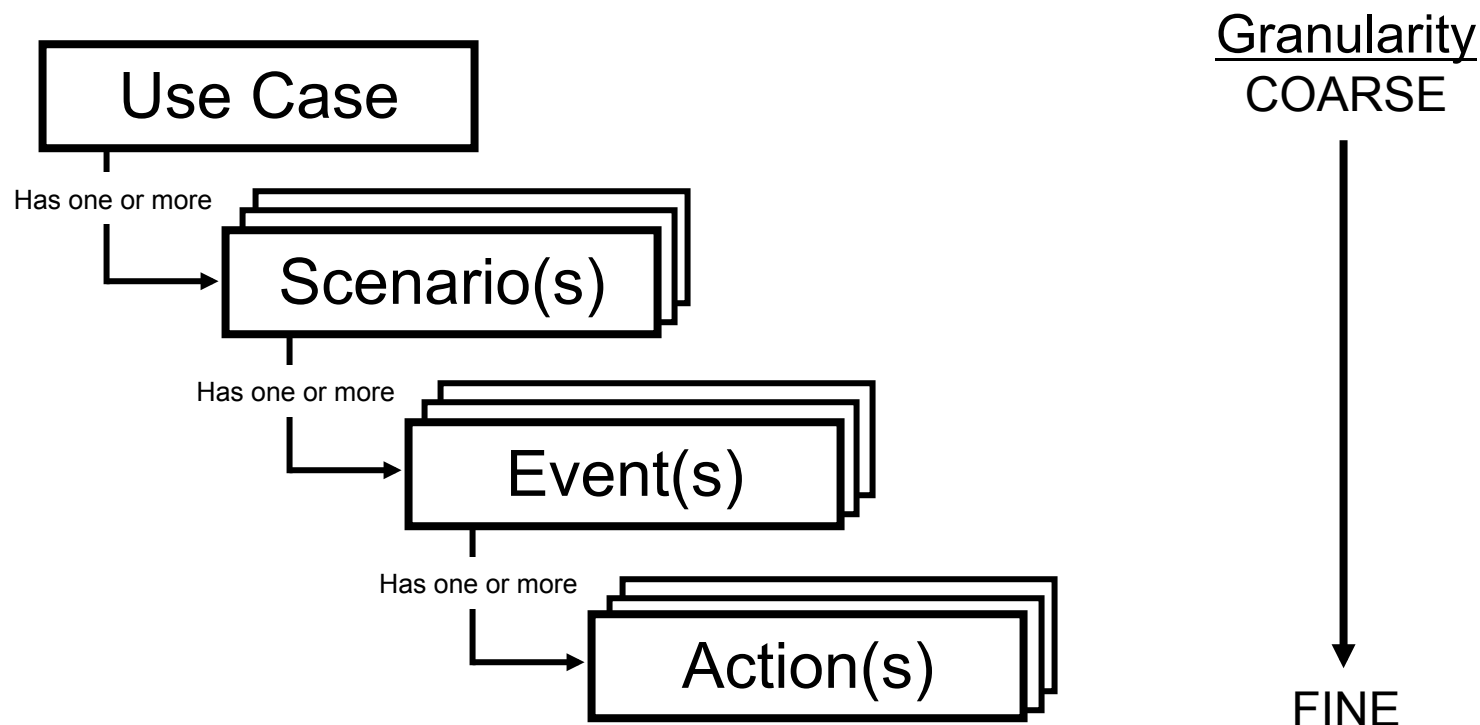
- Y1 EHR/Lab Results Reporting
 - Sherry Selover, Selover EDI Solutions
- Y1 Consumer Empowerment
 - Kim Salamone, Health Services Advisory Group
- Y1 Biosurveillance
 - Gora Datta, Cal2Cal
- Y2 Quality Reporting
 - Kim Salamone
- Y3 Remote Monitoring
 - Sherry Selover

Use Case Alignment Objectives

- Show:
 - How ONC/AHIC/HITSP Use Cases are aligned with (supported by) HL7 EHR/PHR Models
 - Alignment methodology, gap analysis
 - How Use Case Actions are evidenced by persistent Action Records

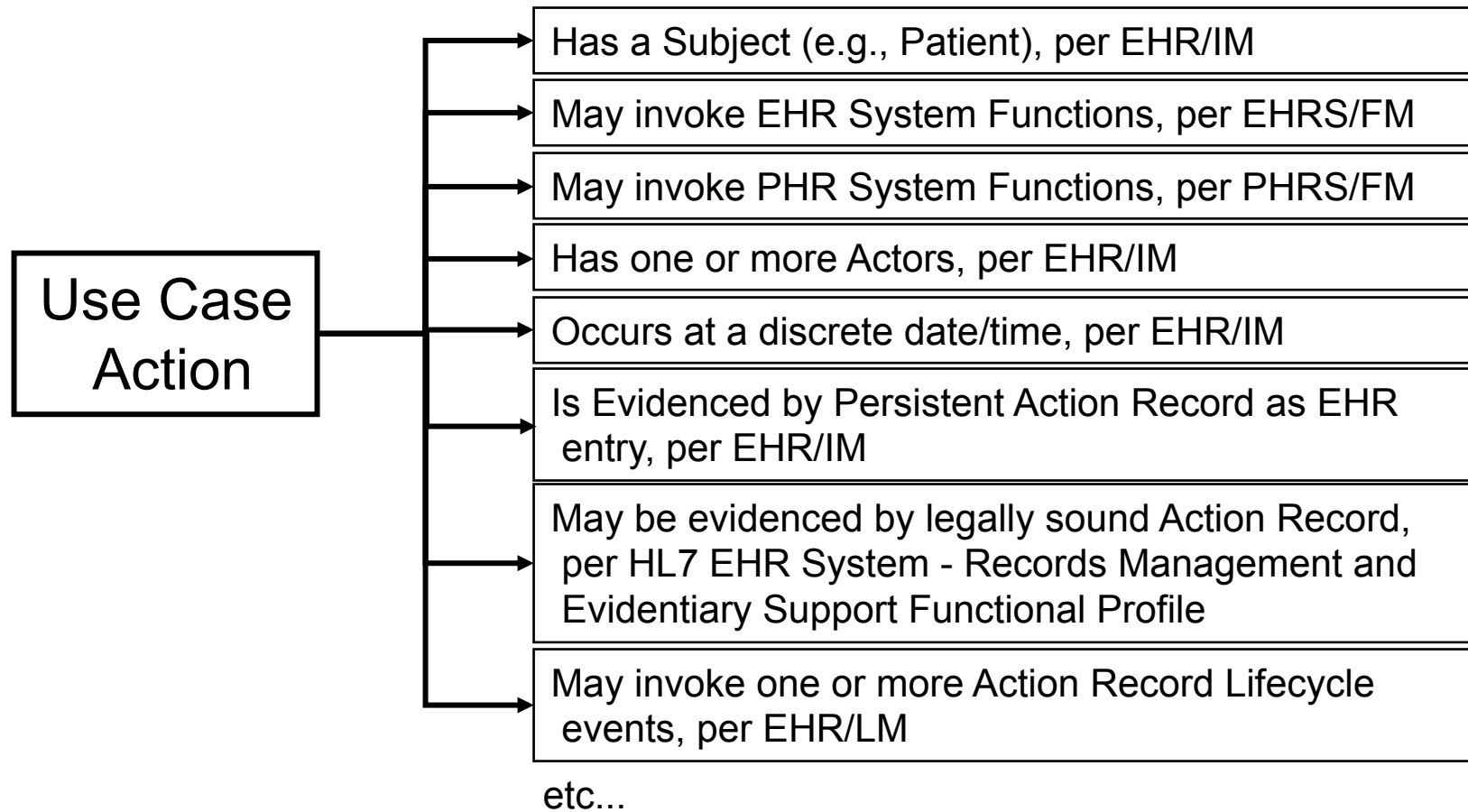
ONC/AHIC/HITSP

Use Case Hierarchy



- Actions occur at leaf level of each Use Case.
- All Use Cases resolve to a set (and sequence) of Actions.

Support for Use Case Actions Designed into HL7 Models



EHR Interoperability Fundamentals

Simple Paradigm

- Start with a discrete unit of service
 - Action
- Establish a corresponding EHR unit of record
 - Action Record
- Persist in EHR
 - Action Records = persistent entries in EHR

Use Case Alignment Analysis

Methodology

1 Review Use Case narrative, Scenarios, Events and Actions.

For each Use Case Action:

2a Specify which EHR system function(s) it likely invokes.

2b Specify any EHR system function(s) that are required but absent from the current EHRs/FM (a gap).

3a Specify which PHR system function(s) it likely invokes.

3b Specify any PHR system function(s) that are required but absent from the current PHRS/FM draft (a gap).

4a Many provider Actions are accountable from a clinical and medical/legal perspective and require a persistent Action Record.
Determine which Use Case Actions require an Action Record, as persistent evidence of Action occurrence.

Use Case Alignment Analysis Methodology, con't

For each Use Case Action (con't):

- 4b For purposes of the persistent EHR, an Action is often logically combined with other closely corresponding Actions. (An Action may be comprised of one or more other Actions, thus an Action Record instance may document one or more Actions.) Determine which Actions may be logically combined in a single Action Record.
- 4c Determine, as applicable, Actions which invoke Act Record Lifecycle Events (per the EHR Lifecycle Model).
- 5 Specify which EHR Interoperability characteristics (per Act/Action Record, Section 3 of the EHR Interoperability Model) are pertinent to evidence Action occurrence – in the form of a persistent Action Record.

Use Case Alignment Analysis

Scenario Completeness

	Documented By	Complete
Action 1	Action Record 1	X
Action 2	Action Record 2	X
Action 3	Action Record 3	X
Action n	Action Record n	X
Use Case Scenario (Sum of Actions)	Action Records 1-n	X

Completion of each Use Case Scenario may be predicated on completion of contained Actions and Action Records.

HL7 Clinical Interoperability Council

Call for Input

- Lead
 - Gary Dickinson

CIC Call for Input Objectives

- To engage professional societies and other stakeholders in the HL7 CIC process via an Initial Call for Input
- To economize their time/cost to participate
- To identify real-world Actions and corresponding data content (Attributes)

CIC Call for Input

Objectives, con't

- To establish a common registry of Actions across Specialties
- To establish a common registry of Attributes
 - Ultimately harmonized across Actions and Specialties
- To promote uniformity in Action and Attribute definition, use and re-use

CIC Call for Input Approach

- Request professional societies and other stakeholder groups submit:
 - Five Actions (acts, tasks, services, procedures) specific to their specialty: top five, any five
 - List of Attributes (data elements) typically collected with each Action

CIC Call for Input

Pilot

- Identify Specialty Actions
- Register Actions, Action descriptions
- Identify Attributes
- Identify Attributes same/similar across Actions and Specialties
- Register harmonized Attributes, Attribute descriptions

CIC Call for Input Pilot, con't

- Develop open tool to maintain Action and Attribute Registry
- Encourage Specialties to build out their registry of Actions, referencing:
 - Harmonized Attributes = preferred
 - or their own?
- Build Use Cases based on registered Actions and Attributes

		Input Submission	Analysis	1 st Derivative (as submitted)	Final Derivative Harmonized across Actions and Specialties
	Who	<ul style="list-style-type: none"> Professional Societies Other Stakeholders 	<ul style="list-style-type: none"> HL7 Clinical Interoperability Council HL7 WGs as applicable 		
ACTIONS	1.1 PILOT Action Registry <u>Actions</u> are discrete acts, tasks, procedures or services.	Identify 5 Actions performed by specialty: <ul style="list-style-type: none"> Action name Action description 	Capture and Register Actions	Action Registry	
	1.2 FUTURE Harmonized Master Action Registry	Identify Additional Actions	<ul style="list-style-type: none"> Analyze Actions for commonalties, duplications Harmonize Actions 		Harmonized Master Action Registry
ATTRIBUTES	2.1 PILOT Attribute Registry <u>Attributes</u> are discrete data elements.	Identify Attributes typically captured with each Action (RETAINED/OUTPUT) <ul style="list-style-type: none"> Attribute name Attribute description 	Analyze and Register Attributes, including: <ul style="list-style-type: none"> Data type and format Coding and classification Reference ranges 	Attribute Registry (data dictionary)	
	2.2 FUTURE Harmonized Master Attribute Registry		<ul style="list-style-type: none"> Analyze Attributes for commonalties, common usage Harmonize Attributes 		Harmonized Master Attribute Registry (data dictionary)
	2.3 FUTURE Action Inputs	Identify Attributes typically referenced as a predicate for Action (INPUT)			
	3 FUTURE Use Cases	Build Use Cases (and Work Flows) using registered Actions			
	4 FUTURE Open Registries		Establish: <ul style="list-style-type: none"> Open Action registry Open Attribute registry 		

Advocacy

EHR Interoperability Proposal

- Lead
 - Bill Braithwaite, MD
 - HL7 Representative to HITSP
 - Co-Chair, ANSI HITSP
- Promotion of HL7 EHR Interoperability Approach
 - To ONC, AHIC 1&2, ANSI HITSP
 - With formal HL7 Sponsorship

To Participate

Contact Gary Dickinson, Facilitator
gary.dickinson@ehr-standards.com

Subscribe to “ehrinterop” list on HL7 web site
<http://www.hl7.org>

Join semi-weekly EHR Interoperability Teleconferences
Tuesdays - 2PM ET (US)

Review Current Projects and Documents on HL7 Wiki
http://wiki.hl7.org/index.php?title=EHR_Interoperability_WG
(user = “wiki”, pass = “wikiwiki”)