

# IHE International Profiles & Tooling Support National Connectivity in the USA: The eHealth Exchange Case Study

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[www.sequoiaproject.org](http://www.sequoiaproject.org)



# The Sequoia Project's Role

The Sequoia Project is a trusted, independent convener of industry and government.

We work to address the challenges of secure, interoperable nationwide health information exchange (HIE).



**SECURE**



**INTEROPERABLE**



**NATIONWIDE**

## Current Sequoia Project Initiatives

eHealth Exchange™

The **eHealth Exchange** is the first and largest public-private health data sharing network in the U.S.

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carequality

**Carequality** is a national-level interoperability framework to inter-connect networks.

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RSNA® Image Share  
VALIDATION

**RSNA Image Share Validation Program** is an interoperability testing program to enable sharing of medical images and reports.

# 2018 Sequoia Priorities



**Specificity & Testing of  
Clinical Documents**



**Provider Directory**



**Enable and Align with  
the Trusted Exchange  
Framework (TEFCA)**



**Patient Matching**



**Consumer Access to  
Health Information**

# Aligns With ONC Mission and Priorities

The Office of the National Coordinator for Health Information Technology

## MISSION AND PRIORITIES

**FEDERAL HEALTH IT MISSION**

Improve the health and well-being of individuals and communities through the use of technology and health information that is accessible when and where it matters most.

**2017-2018 ONC PRIORITIES**

ONC will work to make health information more accessible, decrease the documentation burden, and support EHR usability under 21<sup>st</sup> Century Cures and MACRA.

The Office of the National Coordinator for Health Information Technology

## ONC 2017-2018 PROJECTED OUTCOMES

	PATIENT	PROVIDER	COMPETITIVE MARKETPLACE
Interoperability	Movable health records to shop for and coordinate care	Ability to efficiently to send, receive, and analyze data	Improved data flow standards Accessible API's
Usability	Lower cost of care through greater provider efficiency More eye contact with providers	Burden reduction: <ul style="list-style-type: none"> <li>• Less wasted time</li> <li>• Less hassle</li> </ul>	Ability to support new business models and software applications

**Steve Posnack, MS, M.H.S**

Director of Standards & Technology - ONC

"2017 ONC Activities and Future Perspectives"

HL7'S 31ST ANNUAL PLENARY & WORKING GROUP MEETING

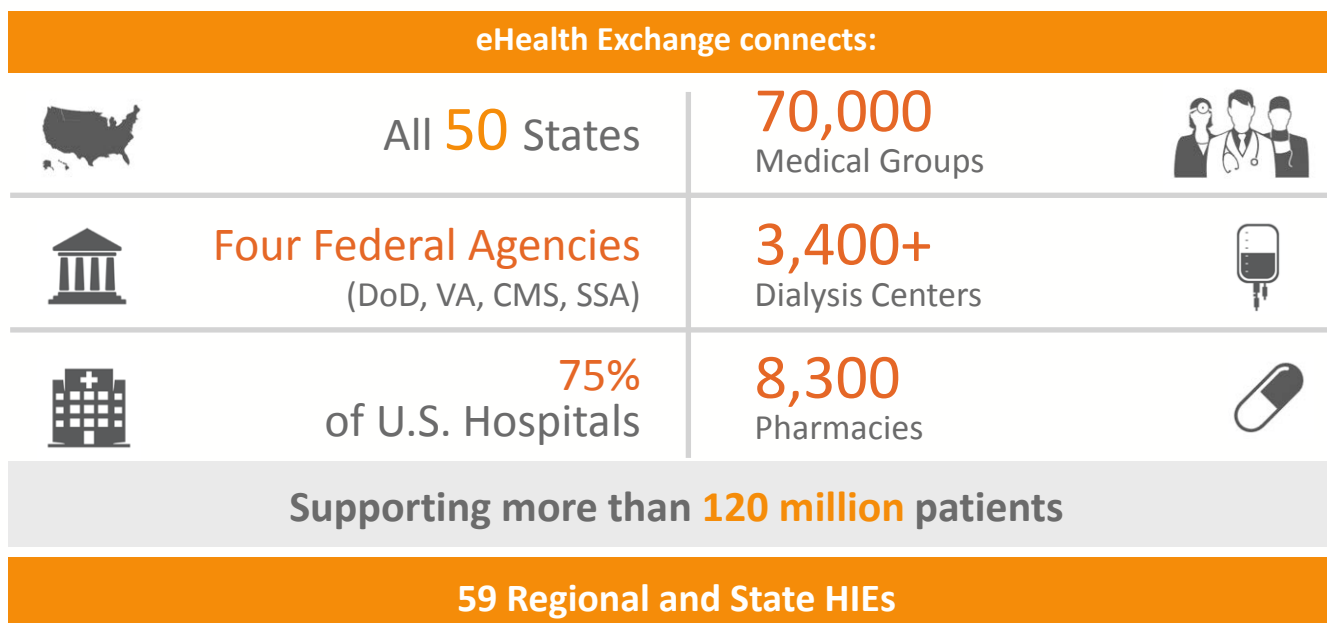
## eHealth Exchange Objectives

- One Multi-Party Data Sharing Agreement
  - Privacy & Security Obligations
  - **Data Use and Reciprocal Support Agreement (DURSA) update 2018**
    - <https://sequoiaproject.org/ehealth-exchange/onboarding/dursa/>
- Establish multi-use framework for information exchange
  - Across communities
  - Between private sector and government
- Agree upon a governance & common set of policies to engender trust
- Standardize interfaces – based on IHE International Standards
- Test once: exchange with many
  - [eHealth Exchange Validation Plan](#)
  - <https://sequoiaproject.org/ehealth-exchange/testing-overview/testing-references-2/>

## eHealth Exchange Testing Program Offerings

- **eHealth Exchange Participant Testing Program:** This process verifies that Systems used by Network Applicants and Participants comply with the Specifications and satisfy the requirements established by the DURSA.
- **eHealth Exchange Validated Product Program:** This process verifies that the Systems developed by Vendors that may be used by Applicants and Participants, comply with the Specifications prior to being implemented in the Applicant's and / or Participant's production environment. The objective is to establish built-in conformance and interoperability into these Systems to minimize variability in System compliance in production.
- **eHealth Exchange Content Testing Program:** documentation, testing methodology, and test data including value sets that will be required for interoperability testing to enable the exchange of clinical content between eHealth Exchange Participants.

## A Nationwide Public-Private Health Data Network Connection Federal Agencies to Each Other & Private Sector



Shared Governance and Trust Agreement

Common Standards, Specifications & Policies



## National Use Cases and Standards Supported

<http://sequoiaproject.org/resources/exchange-specifications/>

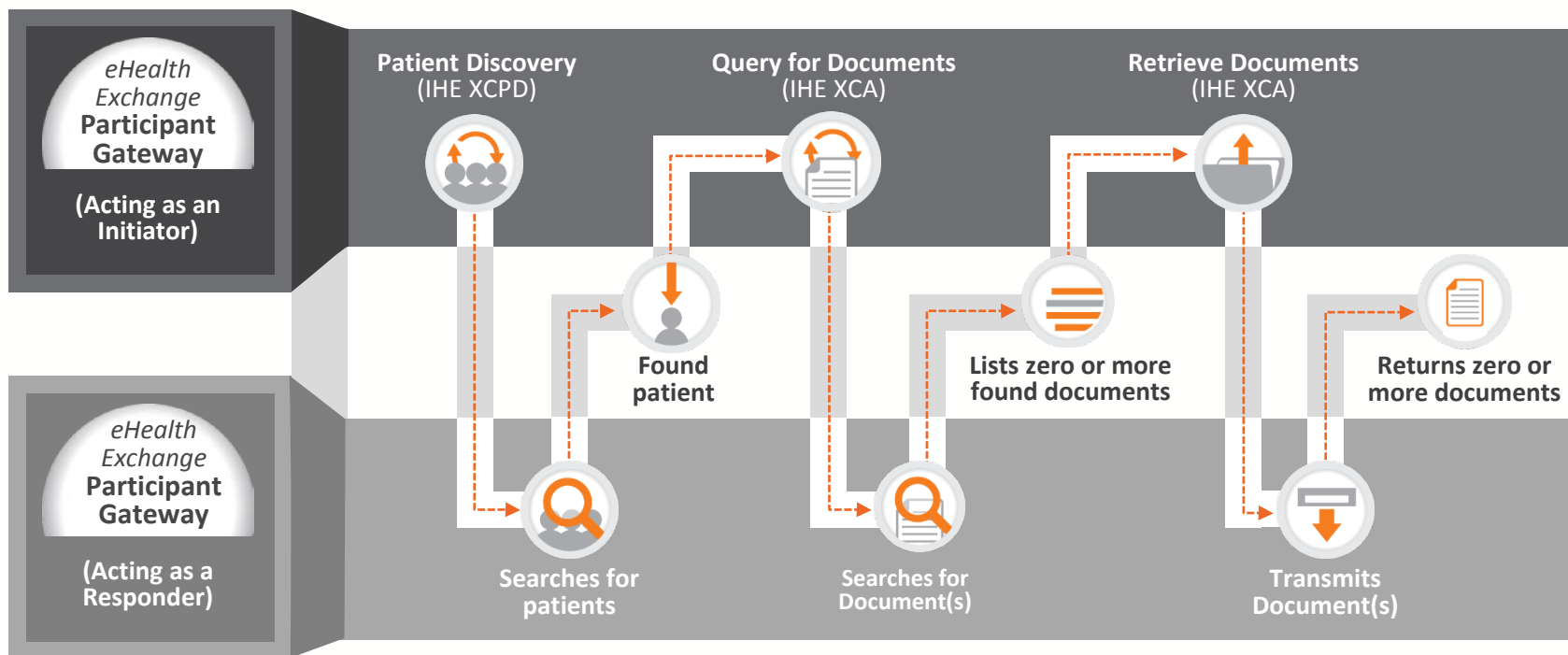


SPECS

### Specifications & Standards

- **Query Use Case: SOAP / SAML + IHE (XCPD, XCA, ATNA, XUA,)**
- Push: ONC NHIN Direct, Document Submission / Admin Distribution
- Content: HL7 CDA, CCD, quality measures
- **HL7® FHIR®**
- **Imaging Exchange**
  - **Integrating the Healthcare Enterprise (IHE) - XDS-I, XCA-I**
- Others added in 2016
  - VPN (transport)
  - HL7 v2 (content)
  - NCPDP, PMIX, SCRIPT

## eHealth Exchange Query Workflow (one of several supported)



## Broad Range of Patient-centric Use Cases



**Treatment / Care Coordination**



**Social Security Benefits Determination**



**Immunization**



**Authorized Release of Information – Consumer Access to Health Information**



**Syndromic Surveillance**



**Encounter Alerts**



**Authorized Release of Information – Life Insurance**



**Prescription Drug Monitoring Program (PDMP)**



**Electronic Lab Reporting (in support of public health)**



**Image Share Use Case**

## RSNA Image Share Validation Program

- **Fills a national Standards Gap**
  - Product conformity assessment testing
- **IHE profiles provide specifications for testing**
- **Modular Standards/Specifications/Test Cases**
  - Cross-Enterprise Document Sharing for Imaging (XDS-I)
    - Document Source and Document Consumer
    - Registry and Repository
  - Cross-Community Access for Imaging (XCA-I)
    - Initiating Gateway
    - Responding Gateway
  - RSNA Image Share PHR



## RSNA Image Share Validated Products



# eHealth Exchange Validated Products



## Benefits of Validation:

New participants leveraging an eHealth Exchange Validated Product reduce effort and cost in onboarding

Vendor	Validated Product
Browsersoft Connected Health	OpenHRE™ from Browsersoft
Cerner	Clinical Exchange Platform
FEDERAL HEALTH AUTHORITY	CONNECT
Epic	Care Everywhere (2012, 2014, 2015)
Greenway Health.	Greenway Exchange
ICA THE INTEROPERABILITY EXPERTS	CareAlign 3.0
IOD	PRISM

Vendor	Validated Product
INTERSYSTEMS	InterSystems HEALTHSHARE™
LTS Health Exchange	LTS HEX
Medicity A Healthagen Business	Network v5 and v7
OPTUM™	Optum HIE 2.0
ORION HEALTH™	Exchange Gateway v3
VERINOVUM Purpose Driven Platforms	eHealth Exchange Gateway 1.0
zeomega®	Jiva HIE Connect
Cerner	Resonance

<http://sequoiaproject.org/rsna/validated-products/>

## Industry-wide Content Pain Points



### **Optionality:**

More than one way to do things and inconsistent implementations across vendors



### **Terminology:**

Inconsistent terminology usage



### **Specification Ambiguity**



### **Complexity:**

The C-CDA standard is difficult to understand and consume and is lacking in clearly documented examples

# Process for Creating Consistent & Robust HL7 C-CDAs



## Content Priorities

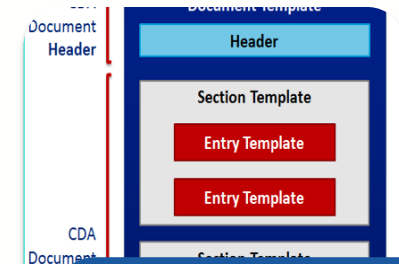
- Clinicians
- Business Office
- Others



Data Mapping	SUT	HL7 C-CDA CCD	
	0	UN	
Patient Gender	1 ("Male")	M	"Administrative Gender" value
	2 ("Female")	F	
"Continuing"	1 ("Yes")	active	"Problem Observation"
	2 ("No")	inactive	

## Data Mapping

- SDO Requirements
- Vendor specific data model overlay
- Semantic Interoperability Transformation



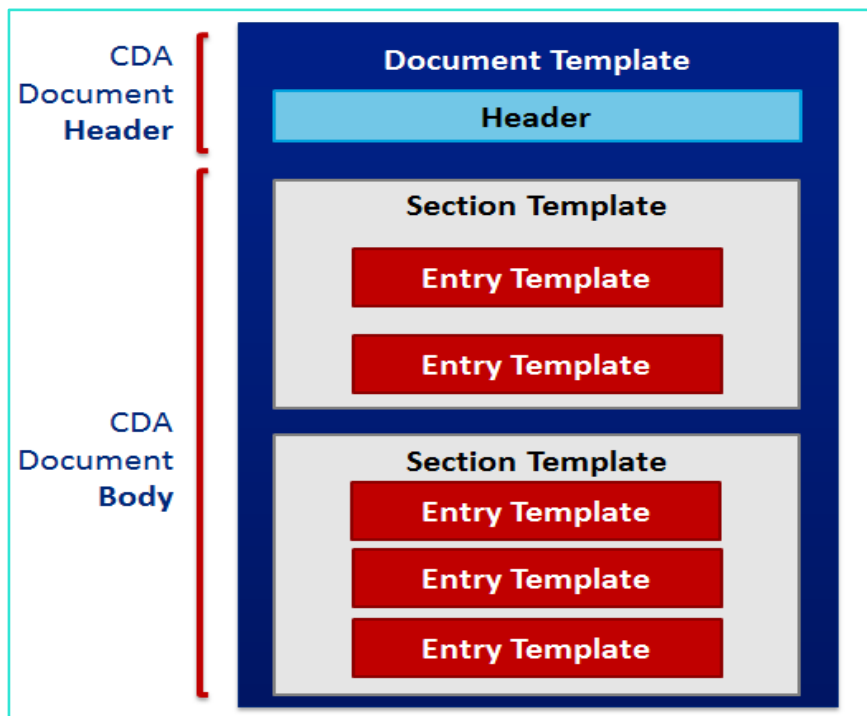
## C-CDA Creation

- Identify Sources
- System Configuration
- Value Sets
- **Internal/External transformation**



# Enhanced Content Testing Program Launch 2018 Feb 5

- eHealth Exchange Content Testing Program:  **Content Access**
  - <https://sequoiaproject.org/ehealth-exchange/testing-overview/content-testing/>



## Content Testing Tooling



### ART DÉCOR/GAZELLE OBJECTS CHECKER

- Hosted by IHE Services Tooling
- Covers only the HL7 CCD, HL7 C-CDA CCD R1.1 and R2.1
- All Errata will be modeled and included for 1.1 and 2.1 including HL7 2.1 Errata package to be released 11/2017
- Included validation of all published value sets for HL7 ©C-CDA
- Found to report on warnings and errors not found by other US Certification testing tooling

# Value Sets

<https://vsac.nlm.nih.gov/>

Requires UMLS license/account

**NIH Value Set Authority Center**  
U.S. National Library of Medicine

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**⚠ VSAC Collaboration Tool will be unavailable from 7:00 A.M. until 1:00 P.M. (ET) on Saturday, 02/03/2018.**

The VSAC is a repository and authoring tool for public value sets created by external programs. Value sets are lists of codes and corresponding terms, from NLM-hosted standard clinical vocabularies (such as SNOMED CT®, RxNorm, and interoperable health information exchange. The VSAC is provided by the National Library of Medicine (NLM), in collaboration with the Office of the Assistant Secretary for Health, U.S. Department of Health and Human Services (CMS) electronic Clinical Quality Measures (eCQM) and interoperable health information exchange. The VSAC is provided by the National Library of Medicine (NLM), in collaboration with the Office of the Assistant Secretary for Health, U.S. Department of Health and Human Services (CMS).

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**All Value Sets**  
Explore the entire VSAC repository of published value sets. Search by value set name, object identifier (OID), codes, terms and purpose. Filter by release program, steward, and code systems.  
**Search**

**CMS eCQM health information measures value sets**  
Learn more [Learn More](#)  
**Search** **Download**

**CMS Hybrid Value Sets**  
Core Clinical Data Elements and Hybrid Measures use a set of core clinical data elements, clinical variables from electronic health records (EHRs), that are routinely collected and can be feasibly extracted for use in risk-adjusted hospital-level hybrid outcome measures. [Learn More](#)  
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**Create a Program Release**

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## Supporting Active Duty Military, Retirees, their Families, & Veterans

### Sample Federal Use Cases

#### DoD and VA:

Support active servicemen and veterans throughout their care by making it possible for medical records to follow the patient, providing caregivers with up-to-date medical histories.

#### Social Security Administration:

Requests claimant's records electronically to make disability determinations. Cut down claims processes *from months to days*.

#### CMS:

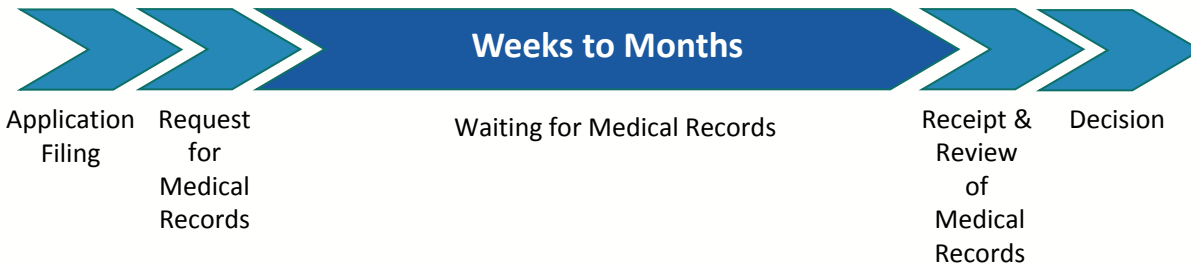
CMS' End Stage Renal Disease (ESRD) program is able to receive quality reporting data from dialysis centers to assure that individuals with ESI receive the highest quality care.



# Social Security Administration Disability Determinations Use Case

## A Closer Look

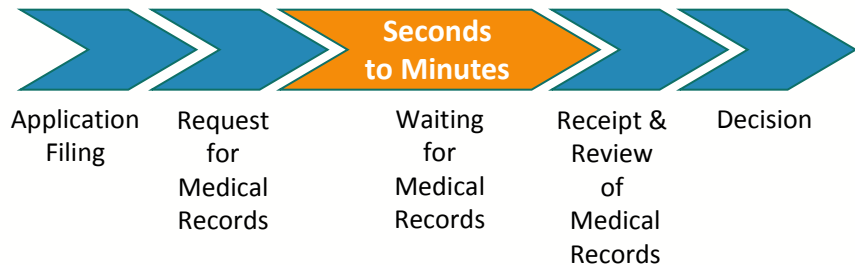
### Manual Process (Mail, Fax, Scan)



### Benefits for Patients

- Faster disability claim determinations
- Quicker access to monthly cash benefits
- Earlier access to medical insurance coverage

### Electronic Process (eHealth Exchange)



***Social Security Disability Programs*** In the course of a year, SSA requests over 15 million records from medical treating sources.

## Supports Alternative Payment Models – Intel Connected Care

- *Intel Corporation* created an incentivized health insurance/care management program, “*Connected Care*”
  - Piloted in New Mexico
  - Rolled out to 20,000 beneficiaries in Portland, OR
  - Launching in other markets
- Beneficiaries receive care from on-campus clinic and contracted providers in Portland
- Value-based payment model where providers measured by customer satisfaction, quality, cost and interoperability
- Progress is measured
- Alternative payment models drive the need for health data sharing and will be the catalyst for change



### ***Intel's Connected Care Program***

Value-based care model designed to improve overall health and wellness of Intel's employees by providing information exchange and real-time care analytics for optimal care

# Lessons Learned: Testing is Key

- Multi-level testing
  - Profile-level testing
  - Product testing and validation
  - Production-level testing to assure production configuration interoperates
- Automated, self-service approach
- Tightly constrained tests
- Focus on known interoperability issues and security, as well as “negative tests”
- Implementation-level testing essential to catch interoperability issues introduced by systems configurations
- Testing eco-system with feedback loop into tightly constrained implementation specifications



# Interoperability is an ongoing, evolving process

- Technology available and in the hands of providers
- Health IT systems tested and validated as conformant and interoperable (tightly constrained transport, security, policy, content, clinical work flow incorporates HIE)
- Health IT systems utilized and records populated with data
- HIE capabilities implemented at scale to enable connectivity
- High-value transactions and use cases implemented
- Transmissions work reliably
- Content sufficiently specified to assure consistency, value, and semantic interoperability to both sender and receiver
- Living process to refine and improve capabilities over time



**Thank You!**

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Convene



Collaborate



Interoperate

