

# HIE READY

*Health information exchange from any system*

For more information on participating in HIE READY, contact us at [iphi@ucdmc.ucdavis.edu](mailto:iphi@ucdmc.ucdavis.edu)

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## INTRODUCTION

Dramatic advances in telecommunications and information management technologies have substantially transformed American culture and many industries, but healthcare has materially lagged other sectors in adopting these new technologies. U.S. healthcare still relies on antiquated methods of recording, storing and sharing information, leading to many of the now well-documented problems in care coordination, quality and patient safety. Improving healthcare quality and care coordination requires that care-related information flow rapidly and securely between and among physician and other healthcare provider offices, hospitals, and other settings of care. To achieve this will require widespread adoption of electronic Health Information Exchange (HIE).

Notwithstanding the improved information flow that electronic health records (EHRs) make possible within a hospital or medical practice, even certified EHRs often have limited capacity to share important care-related data with other EHRs. Upgrading EHRs so that information can be exchanged with other EHRs typically requires additional customization to create interfaces that allow the EHRs to communicate with each other. This requires additional expense and time.

To facilitate the adoption of HIE and help address the need for EHRs to “talk with each other”, the California Health eQuality (CHeQ) program in UCD’s Institute for Population Health Improvement (IPHI), has produced this *HIE Ready Buyers’ Guide* to identify interoperability and interface features that should be in place to support healthcare data exchange *today*.

## ABOUT THE *HIE READY*BUYERS’ GUIDE

The cost and time it takes to implement bi-directional interfaces so that EHRs of two or more healthcare professionals, organizations, or providers can fully communicate is a major hurdle. Meaningful Use provisions for Stage 1 and Stage 2 require some HIE capabilities. Those requirements, however, are limited and do not cover the full range of interoperability and interface features needed for robust HIE. Specifying a certified EHR is not enough to ensure it can also exchange the relevant information. The *HIE Ready* specifications permit providers to specify the level of interoperability they want in their EHR. The Buyers’ Guide provides a way for providers to examine the capabilities of a vendor’s product, as well as the capabilities a Health Information Organization (HIO) offers.

This Buyers’ Guide will help physicians, hospitals, and other healthcare providers make informed choices when discussing HIE capabilities with EHR vendors or HIOs. It allows purchasers to make side-by-side comparisons of important HIE features based on commonly accepted interoperability and interface standards embedded in the EHRs of those entities that participate in *HIE Ready*. The Guide also provides information on how well an HIO supports those same standards.

*HIE Ready* is a set of commonly accepted standards and features identified by CHeQ that are: 1) available in many EHR and HIE systems, and 2) whose deployment now will enable parties to exchange health information critical for care delivery. *HIE Ready* is consistent with Stage 1 Meaningful Use and the current version of the federal Office of the National Coordinator for Health Information Technology Authorized Testing and Certification Bodies (ONC-ATCB) for

EHR technology. It also will be consistent with Stage 2 Meaningful Use and 2014 ONC-ATCB certification criteria.

Organizations participating in the Buyer's Guide recognize the importance of transparency and providing purchasers a straightforward, standardized way to evaluate their needs and product availability. They have entered into a Memorandum of Understanding (MOU; Appendix A) with IPHI that attests to their capabilities, and in most cases their costs. The Buyer's Guide reports on relative cost and six capabilities: Admit, Discharge, Transfer information (ADT)/demographics, laboratory and radiology results/notes; referrals and appointments; care summary/continuity of care document (CCD); and public health reporting. Detailed information about the specific components within these capabilities is provided in Appendix B.

CHeQ understands that healthcare providers consider many factors in choosing an EHR or HIO best-suited to their particular needs and practice environment. While most EHR systems may include the capacity to share the information specified in *HIE Ready*, it may be available through a complex list of optional components. *HIE Ready* gives providers a clear way to specify the EHR features needed for health information exchange.

Importantly, CHeQ does not endorse any particular vendor or HIE approach and provides this Guide simply as a tool that may be used to facilitate comparison of the essential interoperability features among the EHR vendors participating in *HIE Ready*.

BUYERS' GUIDE

Vendor or Organization <i>(Product name in italics)</i>	<i>HIE READY</i> Capabilities						Relative Cost	California Connects
	ADT/ Demographics	Lab & Rad Results, Notes	Lab & Rad Orders	Referrals, Appointments	Care Summary (CCD)	Public Health Reporting		
<b>Ambulatory EHRs [1]</b>								
4Medica – <i>Ambulatory Cloud iEHR 10.4</i>	●	●●●	●●●	○	●●	●●●●	\$0	
Med A-Z – <i>Med A-Z</i>	●●●	●●	●●●●	●	●●●●	●●●●	\$0	
Data Strategies – <i>MDSuite 6.1</i>	○	●	●	●	●●	●●●●	\$0	
MedStreaming – <i>All in One EMR/PACS/PM</i>	●●●●	●●●●	●●●●	●●●●	●●●●	●●●●	\$0	
Mitochon – <i>Mitochon Systems 4.0</i>	●	●●●	●	●	●●●	●●●●	\$0	
Office Ally – <i>EHR 24/7</i>	●	●●	●●●	●	●●●	●●●●	\$	
<b>Health Information Organizations</b>								
EKCITA	●●●●	●●●●	●●●●	●●●●	●●●●	●●●●	\$\$\$\$	●
North Coast Health Information Network	●●	●●●	○	●	○	○	NP	
OCPRHIO	●●●	●●●●	●●●	○	●●●●	●●●●	NP	
Redwood MedNet	●●●	●●●	●●●	●	●●●●	●●●●	\$\$\$	●
San Diego Beacon Community	●●●	●●●	○	●	●●	●	NP	
Santa Cruz Health Information Exchange	●	●●●	●●●●	●	●●	●	\$	●

- HIE Ready:** ○ No capability.  
● to ●●●● HIE capability, from least capable, one ●, to most capable, four ●●●●.
- Costs:** \$0 Some organizations offer *HIE Ready* at no additional cost.  
\$ to \$\$\$\$ Relative cost, from lowest cost, one \$, to highest cost, four \$\$\$\$.  
NP Did not provide a cost for *HIE Ready*. For HIOs, a cost may not be defined or standardized.
- California Connects:** ● Demonstrated that the product was *HIE READY* at 2012 California Connects.
- Notes:** 1. All ambulatory EHR vendors have ONC-ATCB certified products for Stage 1 Meaningful Use.

## ABOUT US

The Institute for Population Health Improvement (IPHI) is committed to creating, applying and disseminating knowledge about the many determinants of health in order to improve health and health security and to support activities which improve health equity and eliminate health disparities. IPHI envisions a world in which the many determinants of health are aligned to promote and sustain optimal health and functionality of both individuals and their larger communities.

California Health eQuality (CHeQ) is a program within IPHI that is funded through a 16-month, \$17.5 million Interagency Agreement with the California Health and Human Services Agency (CHHS) to develop and implement HIE programs according to the State's Cooperative Grant Agreement with ONC. CHeQ's full range of programs intends to promote healthcare quality and coordination of care by expanding underserved communities' capacity to exchange health information and/or access to Direct; improving sharing of immunization, laboratory, and care information; and providing tools to assist providers in identifying private, secure, standardized and trusted systems.

[Kenneth W. Kizer](#), IPHI director and Distinguished Professor, UC Davis School of Medicine and Betty Irene Moore School of Nursing, leads CHeQ. Dr. Kizer has a long history of public and private sector experience in health information technology, health care quality improvement and population health. Among his previous activities in this regard, Dr. Kizer was the founding President and CEO of the National Quality Forum, a Washington, DC-based quality improvement and consensus standards-setting organization, and before that he served as the Under Secretary for Health, U.S. Department of Veterans Affairs, where he led the VA's transition to electronic health records and health information exchange in the late 1990s. He also was the Director of the former California Department of Health Services from 1985 to 1991, where he initiated a number of health information management modernization efforts.

UC Davis Health System is improving lives and transforming health care by providing excellent patient care, conducting groundbreaking research, fostering innovative, interprofessional education, and creating dynamic, productive partnerships with the community. The academic health system includes one of the country's best medical schools, a 631-bed acute-care teaching hospital, a 1000-member physician's practice group and the new Betty Irene Moore School of Nursing. It is home to a National Cancer Institute-designated comprehensive cancer center, an international neurodevelopmental institute, a stem cell institute and a comprehensive children's hospital. Other nationally prominent centers focus on advancing telemedicine, improving vascular care, eliminating health disparities and translating research findings into new treatments for patients. Together, they make UC Davis a hub of innovation that is transforming health for all. For more information, visit [healthsystem.ucdavis.edu](http://healthsystem.ucdavis.edu).

## MEMORANDUM OF UNDERSTANDING EHR-HIE INTERFACE AND INTEROPERABILITY

This Memorandum of Understanding (“**AGREEMENT**”), dated \_\_\_\_\_ (the “**Effective Date**”), establishes the framework for a collaborative agreement for the Electronic Health Record/Health Information Exchange Interface and Interoperability Project (the “**PROJECT**”) between the entity listed below (“**ENTITY**”) and The Regents of the University of California on behalf of its University of California Davis Health System, Institute for Population Health Improvement (“**UCDHS IPHI**”) (each a “**PARTY**” and collectively the “**PARTIES.**”)

ENTITY Name	
Type of Entity	<input type="checkbox"/> EHR Vendor <input type="checkbox"/> EHR Purchaser (Clinic / Provider) <input type="checkbox"/> Hospital <input type="checkbox"/> Integrated Delivery Network <input type="checkbox"/> IPA <input type="checkbox"/> HIO (Public or Private Health Information Exchange Organization) <input type="checkbox"/> Lab <input type="checkbox"/> Other _____
Address	
City, State, Zip	
Point of Contact	
E-mail and Phone	
Alternate Contact	
E-mail and Phone	

### 1. PURPOSE

This AGREEMENT sets forth the expectations of the PARTIES to support a standards-based set of common implementation specifications (“**SPECIFICATIONS**”) as defined in Exhibit A, attached hereto, enabling data exchange between instances of Electronic Health Record (“**EHR**”) software and a Health Information Exchange Organization or another healthcare stakeholder (both referred to as “**HIO**”) involved in exchanging health information in the State of California.

UCDHS IPHI anticipates that other entities signing an EHR-HIE Interface and Interoperability agreement are organizations that are directly or indirectly involved in patient care and expect to use the SPECIFICATIONS.

### 2. BACKGROUND

The State of California has engaged UCDHS IPHI to serve as the state’s agency to develop and implement Health Information Exchange (“**HIE**”) programs as set forth in the state’s grant agreement with the Federal Office of the National Coordinator for Health Information Technology (“**ONC**”), U.S. Department of Health and Human Services. UCDHS IPHI is charged with developing policies, services and innovations that make possible the appropriate, secure and efficient exchange of electronic health information for the purpose of improving health, health care safety, access and efficiency for all Californians.

### 3. THE OPPORTUNITY

The adoption of certified EHR systems and the capability to connect and interoperate with HIOs and other interoperable EHR systems is or should be a concern to all stakeholders in a healthcare system. Historically each connection between an EHR and a HIO or other endpoints

represents a significant expenditure of resources to develop custom interfaces, and thereby limiting the benefits to all stakeholders. Existing methods are costly, take time and often deliver only a sliver of what is possible. Approaches such as Point-to-Point interfaces, the Direct Project, Integrating the Healthcare Enterprise and others exist, but have had limited adoption or are still in the standards development phase.

An opportunity exists to leverage current HL7 standards using interface and interoperability features already built into most EHR software to create a SPECIFICATION that the PARTIES can support. The goal is to achieve a win-win approach for all stakeholders, based on a substantial adoption growth curve, by providing valuable connection capabilities and reducing the overall connection cost through the SPECIFICATION. The result will be a more robust EHR product with pre-integrated data sharing capabilities for providers that, in turn, will promote adoption of truly interoperable EHRs.

The potential for technology to support a larger transformation and enable HIE is increasingly apparent and the federally designated Regional Extension Centers (“**REC**”) in California provide critical technical assistance to the broadest range of providers. The work of the HIO is difficult and the REC help to promote health data liquidity to enable providers, patients, health care organizations and other stakeholders ensure that the right information is available, for the right patient and at the right time, ensuring the highest quality health care is delivered in the most cost-effective manner. True transformation will depend on the conversion of a traditional, disparate, paper-based system into a statewide health information network based on the electronic exchange of data serving the needs of patients, providers and healthcare decision makers. The goal is to work in collaboration and harness REC services that provide an increase of EHR adoption, dissemination of health Information Technology (“**IT**”) best practices and other health IT initiatives to strengthen HIE efforts.

While UCDHS IPHI proposes through this AGREEMENT a set of requirements that EHR and HIE vendors and HIOs can support today, the intent is to evolve and improve the PROJECT over time, ultimately leading to “plug-and-play” interoperability as envisioned by UCDHS IPHI, the ONC and the EHR | HIE Interoperability Workgroup<sup>1</sup>. The PARTIES to this AGREEMENT agree to support this process.

#### **4. THE PROJECT**

The PARTIES as participants in the PROJECT agree to develop strategies, requirements, technical specifications and validation criteria based on the SPECIFICATION to connect ambulatory EHRs to HIOs and other endpoints. If ENTITY is an EHR Vendor, EHR Vendor agrees to package and present products and services for rapid deployment and with transparent pricing to the purchasers. The ultimate goal will be a fully operational bi-directional connection between an EHR and a HIO or other endpoints that can be rapidly deployed at an affordable cost.

#### **5. JOINT RESPONSIBILITIES OF THE PARTIES:**

- a. Promote the SPECIFICATION to healthcare stakeholders in California.
- b. Participate in PROJECT meetings, including calls, wiki or web collaboration sites and occasional in-person meetings arranged by the UCDHS IPHI California Health eQuality (“**CHeQ**”) program.

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<sup>1</sup> Information on the EHR | HIE Interoperability Workgroup is found at [www.interopwg.org](http://www.interopwg.org)

- c. Collaborate on an on-going basis regarding changes and enhancements to the SPECIFICATION as the industry finalizes new standards and improves existing standards.
- d. Support and promote the EHR | HIE Interoperability Workgroup which was organized by the New York eHealth Collaborative (“NYeC”) and cooperatively lead by NYeC and CHeQ.
- e. Support and promote the ONC supported Western States Consortium in their effort to develop policies and procedures for sharing data across state borders.
- f. Support events such as “California Connects” by attending and participating in a connect-a-thon like atmosphere to show stakeholders what is possible today using the SPECIFICATION as well as test new and emerging standards and capabilities.

## 6. ENTITY ROLES AND RESPONSIBILITIES:

- a. Determine the specific approach you wish to take in supporting the SPECIFICATION. Indicate your choice by selecting and completing the appropriate matrix as identified in Exhibit B, attached hereto. Note that the selected Exhibit B matrix will form the basis for how UCDHS IPHI communicates your level of commitment to the PROJECT and how UCDHS IPHI describes your product or services to other HIOs.
- b. Actively promote the elements set forth in this AGREEMENT to your clients, employees, members or constituents as appropriate.
- c. EHR Vendor agrees to offer HIE Ready meeting the SPECIFICATIONS more fully defined in Exhibit A, at prices set to any healthcare stakeholder in California that is currently using a licensed EHR under maintenance from the EHR Vendor or has entered into an agreement to purchase an EHR from the EHR Vendor.
- d. EHR Vendor participating in REC Group Purchasing programs agrees to offer HIE Ready to REC members at pricing that is equal to or better than pricing currently included in Group Purchasing agreements.
- e. **ENTITY acknowledges and understands that participation in the PROJECT does not constitute an endorsement of any products or services by UCDHS IPHI.**

## 7. UCDHS IPHI RESPONSIBILITIES:

- a. Collaborate and coordinate with REC in California for REC’s development and implementation of a marketing and outreach campaign, which includes branding, website and collateral intended for REC to promote the benefits of purchasing an EHR system from a vendor that has signed an EHR-HIE Interface & Interoperability Agreement.
- b. In collaboration with the REC in California, create and publish a buyer’s guide intended to educate and inform stakeholders of the HIE and interoperability capabilities that each of the EHR Vendors and HIOs offer and their relative cost.
- c. Collaborate and coordinate with REC in California.
- d. Convene meetings as described herein.

## 8. MODIFICATIONS

This AGREEMENT may be modified upon written agreement of the PARTIES. No oral statement by any person shall be interpreted as modifying or otherwise affecting the terms of this AGREEMENT. UCDHS IPHI reserves the right, for any reason, in its sole discretion, to terminate, change, suspend or discontinue any aspect of the PROJECT. UCDHS IPHI may

restrict, suspend or terminate access to or use of the PROJECT, or remove any content, at any time, for any reason or for no reason at all, without notice and without penalty.

**9. NOTICE**

All notices, requests, or other communications required under this AGREEMENT shall be in writing and shall be delivered to the respective PARTIES by personal delivery; by deposit in the United States Postal Service as certified or registered mail, postage prepaid, return receipt requested; or by a reputable overnight delivery service such as Federal Express. Notices shall be deemed delivered on the date of personal delivery, on the date indicated on the United States Postal Service return receipt, or on the date indicated by express mail receipt, as applicable. Notices shall be addressed to the PARTIES at the addresses set forth below:

UCDHS IPHI:	ENTITY:
Health System Contracts	_____
Sherman Building, Room 2300	_____
2315 Stockton Boulevard	_____
Sacramento, CA 95817	_____

Either PARTY may change its address by written notice to the other during the term.

**10. USE OF UCDHS IPHI NAME**

ENTITY shall not use the name or logos of the UCDHS IPHI, including but not limited to The Regents of the University of California, University of California or UC Davis, in any form or manner in any publicity, advertisements, reports or other information released to the public without the prior written approval of UCDHS IPHI.

**11. ASSIGNMENT**

UCDHS IPHI reserves the right to assign this AGREEMENT, assign its rights under this AGREEMENT, or delegate duties under this AGREEMENT without prior written consent of ENTITY.

**12. TERM AND TERMINATION**

The term of this AGREEMENT is one (1) year from the Effective Date and shall renew automatically, unless a PARTY notifies the other PARTY at least 60 days prior to the end of the current term. Either PARTY may terminate this AGREEMENT at any time, with or without cause and without incurring any liability or obligation, by giving the other PARTY at least 60 days prior written notice of termination.

**13. THE EXHIBITS**

- Exhibit A – EHR-HIE Interface Requirements and Specifications – HIE Ready
- Exhibit B – Matrix of commitment to specific features, deliverable and costs for:
  - Ambulatory EHR
  - Hospital Electronic Medical Record (EMR/EHR)
  - Health Information Exchange Organization (HIO)
  - Health Information Exchange (HIE) Vendor

#### **14. MARKETING CONTENT**

To the extent ENTITY provides UCDHS IPHI with any marketing content (e.g. text, graphics, logos, artwork, data) in connection with the PROJECT (collectively, "**CONTENT**"), ENTITY hereby grants UCDHS IPHI and its affiliates a non-exclusive, worldwide, royalty-free license to use the CONTENT for the purpose of the PROJECT. ENTITY is responsible for obtaining all rights, permissions, licenses and consents required to furnish CONTENT to UCDHS IPHI.

#### **15. PROJECT DATA (Not Protected Health Information)**

The ENTITY grants UCDHS IPHI a non-exclusive, perpetual, irrevocable, fully-paid-up, royalty free license to use data derived from the PROJECT ("**DATA**") for UCDHS IPHI's business purposes. ENTITY further grants UCDHS IPHI the right to (i) use DATA in any aggregate or statistical products or reports, (ii) transfer and/or disclose the DATA (iii) disclose DATA in a summary report that does not show, display or indicate ENTITY or any ENTITY identifying information, (iv) provide DATA to a third party for analytical purposes and/or (v) use the DATA (without identifiable information) to compare with other organizations within the same industry or group. DATA shall, in no event, be considered confidential information of ENTITY; however DATA shall not include (directly or by inference) any information identifying ENTITY or any identifiable individual.

#### **16. DISCLAIMER**

THE UCDHS IPHI PROJECT SERVICES ARE PROVIDED "AS-IS", "WHERE-IS" AND "AS-AVAILABLE," WITH ALL FAULTS AND WITHOUT WARRANTY OF ANY KIND. UCDHS IPHI HEREBY DISCLAIMS ON BEHALF OF ITSELF, ITS EMPLOYEES, CONTRACTORS, UNIVERSITY OF CALIFORNIA EMPLOYEES, THE REGENTS OF THE UNIVERSITY OF CALIFORNIA, AFFILIATES AND OTHER AGENTS (COLLECTIVELY, "**UCDHS IPHI AGENTS**") ANY AND ALL WARRANTIES OF ANY KIND, EXPRESS, IMPLIED OR STATUTORY, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, NON-INFRINGEMENT OR TITLE. NEITHER UCDHS IPHI NOR ANY OF THE UCDHS IPHI AGENTS REPRESENT OR WARRANT THAT THE UCHDS IPHI PROJECT SERVICES WILL BE UNINTERRUPTED OR ERROR-FREE, THAT DEFECTS, IF ANY, WILL BE CORRECTED, OR THAT THE UCDHS IPHI PROJECT SERVICES ARE FREE OF VIRUSES OR OTHER HARMFUL COMPONENTS; NOR DOES UCDHS IPHI OR ANY OF THE UCDHS IPHI AGENTS MAKE ANY REPRESENTATIONS OR WARRANTIES ABOUT THE ACCURACY, RELIABILITY, CURRENCY, QUALITY, PERFORMANCE OR SUITABILITY OF THE UCDHS IPHI PROJECT SERVICES. IN THE EVENT OF ANY PROBLEM WITH THE UCDHS IPHI PROJECT SERVICES, ENTITY'S SOLE AND EXCLUSIVE REMEDY UNDER THIS AGREEMENT IS LIMITED TO CEASING USE OF THE UCDHS IPHI PROJECT SERVICES.

#### **17. INDEMNIFICATION**

ENTITY shall defend, indemnify and hold UCDHS IPHI, its officers, employees and agents harmless from and against any and all liability, loss, expense (including reasonable attorneys' fees), or claims for injury or damages arising out of the performance of this AGREEMENT, including use of CONTENT, but only in proportion to and to the extent such liability, loss, expense, attorneys' fees, or claims for injuries or damages are caused by or result from the negligent or intentional acts or omissions of ENTITY, its officers, agents or employees.

**18. LIMITATION OF LIABILITY**

IN NO EVENT SHALL UCDHS IPHI OR ANY UCDHS IPHI AGENTS BE LIABLE FOR ANY CONSEQUENTIAL, INCIDENTAL, EXEMPLARY, PUNITIVE, DIRECT, INDIRECT OR SPECIAL DAMAGES OF ANY NATURE ARISING FROM BREACH OF WARRANTY, BREACH OF CONTRACT, NEGLIGENCE OR ANY OTHER LEGAL THEORY, WHETHER IN TORT OR CONTRACT, EVEN IF SUCH PARTY HAS BEEN APPRISED OF THE LIKELIHOOD OF SUCH DAMAGES OCCURRING, INCLUDING WITHOUT LIMITATION, DAMAGES FROM INTERRUPTION OF BUSINESS, LOSS OF INCOME OR OPPORTUNITIES, LOSS OF USE OF THE UCDHS IPHI PROJECT SERVICES, LOSS OF DATA, COST OF RECREATING DATA OR COST OF CAPITAL. THIS SECTION STATES ENTITY'S SOLE REMEDY FOR HARM UNDER THIS AGREEMENT WHATSOEVER, IN CONTRACT OR TORT. NOTHING IN THIS SECTION SHALL LIMIT EITHER PARTY'S RIGHT TO SEEK INJUNCTIVE OR OTHER EQUITABLE RELIEF.

**19. RELATIONSHIP OF PARTIES**

In making and performing this AGREEMENT, the PARTIES are and shall act at all times as independent contractors, and nothing contained herein shall be construed or implied to create an agency, association, partnership or joint venture between the PARTIES. At no time shall either PARTY make commitments or incur any charges or expenses for or in the name of the other PARTY.

**20. GOVERNING LAW**

This AGREEMENT shall be governed by and enforced under the laws of the State of California.

**21. EXECUTION**

IN WITNESS WHEREOF, and intending to be legally bound, The PARTIES have caused this AGREEMENT to be executed by their duly authorized representatives as of the last date signed below:

For ENTITY	For UCDHS IPHI
By: _____ Name: _____ Title: _____	By: _____ Michael J. Hughes Assistant Director, UCDHS IPHI
DATE: _____	DATE: _____

## Exhibit A

### EHR – HIE Interface Requirements and Specifications – HIE Ready

#### General Requirements

EHR Vendor to provide an interface for the EHR application instance operated for the physician or group offered as HIE ready (“**HIE Ready**”), which is priced, quoted and sold including:

- Interface executables and documentation
- Delivered at or before the time of EHR software load, if ordered with EHR implementation, or
- Delivered within 30 days after receipt of order, if ordered separately
- Interface messaging functionality that supports the message type requirements below
- Triggers embedded in the EHR application that support the workflow functionality requirements below
- An exception queue capability that the provider can manage
- Level 2 interface support to HIO or interface contractor

#### Implementation and Support

Implementation will be provided by the HIO or interface contractor and will include:

- Establishing secure connectivity between HIO and EHR interface
- Testing and mapping of individual interfaces
- Ongoing level 1 interface support

#### Base Level Interface Specification

##### Information inbound to the EHR:

- Structured Lab Results as HL7 2.3.1 or 2.5.1 messages using EHR Vendor-specified and transport protocols
- Radiology Reports as HL7 Observation Result ORU messages using EHR Vendor-specified transport protocols
- Other Reports as HL7 Observation Result ORU messages using EHR Vendor-specified transport protocols
- Care Summary as HITSP C32 CCD documents using EHR Vendor-specified transport protocols

##### Information outbound to HIO:

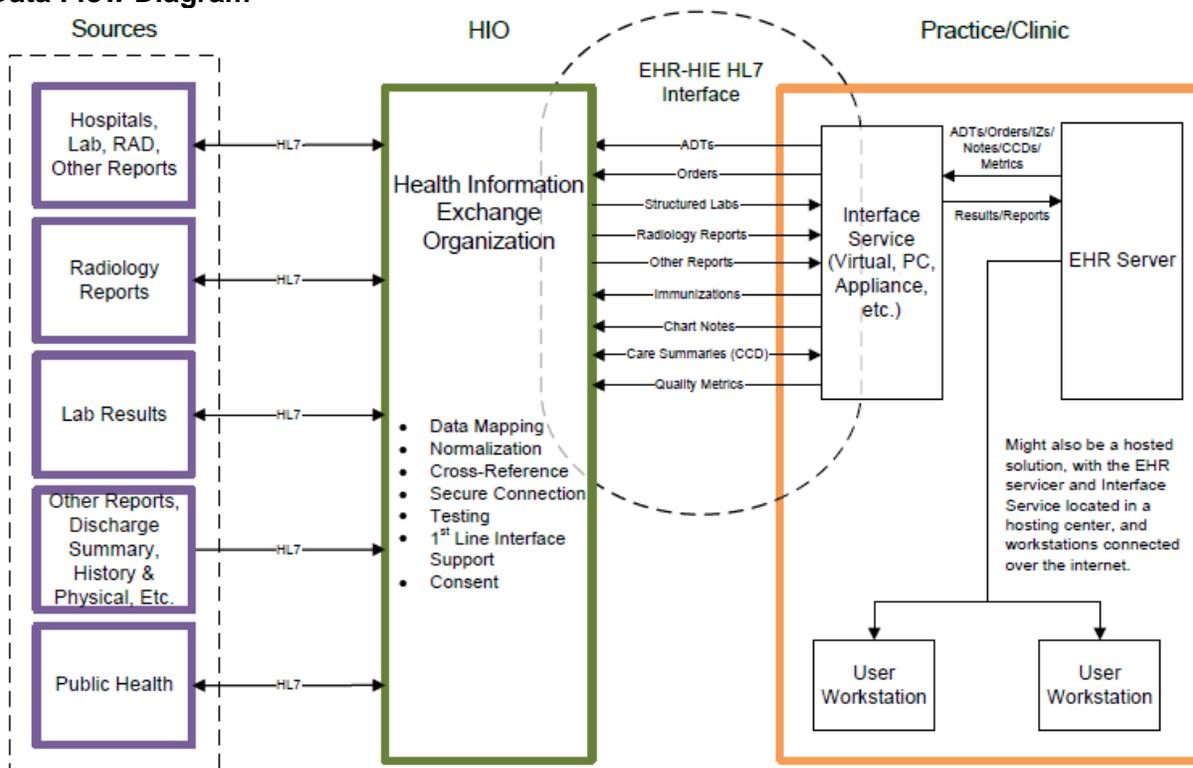
- Patient Demographics as HL7 Registration and demographics (ADT) messages using EHR Vendor-specified transport protocols
- Immunization Administration as HL7 messages using EHR Vendor-specified transport protocols
- Care Summary as HITSP C32 CCD documents to a local file system or EHR using EHR Vendor-specified transport protocols to an external document repository
- Chart Notes (i.e. progress notes, history and physical, consult letters, referrals) as HL7 Observation Result ORU messages using EHR Vendor-specified transport protocols
- Orders (non-medication) as HL7 ORM order messages using EHR Vendor-specified transport protocol

For Structured Lab Results, Immunization Administration and Care Summary Exchange, the above requirements are consistent with the requirements for ONC-Authorized Testing and Certification Bodies certification for Centers for Medicare and Medicaid Services Stage 1 meaningful use incentive program.

### Transport

The EHR will utilize transport protocols appropriate to the type and nature of data being transmitted and will be secured as required by the Health Insurance Portability Accountability Act. The EHR Vendor and HIO will mutually agree on the transport protocols and encryption processes at the time of implementation.

### Data Flow Diagram



Please see Appendix B for the Exhibit Bs unique to Ambulatory EHR vendors Hospital EHR vendors, and HIOs

## Appendix B: Ambulatory EHR

The preferred version of HL7 that California is focused on supporting is version 2.5.1. We recognize that not all vendors currently support this version, so we are also accepting, at this time, interfaces which conform to the HL7 version 2.3.1 specification. In the right-hand columns we are asking the vendor to list:

- **YES, as Shown (Give Version)** If you produce or consume the message with the trigger shown, please indicate which HL7 version.
- **Message, Version, & Trigger?** If you produce or consume a message that performs the same or similar function as the message and trigger shown, please note the message, trigger, and HL7 version.
- **If not now, when?** If you do not currently produce or consume the message and trigger indicated in either of the previous columns, please note when you expect to accommodate the message indicated. NO PLAN (to do this) is an acceptable answer.

### Section 1: HL7 Messages Inbound to EHR

The EHR receives and consumes from the HIE (or others) properly formatted HL7 ADT, MDM, ORU, REF, RRI, and SRM messages of version 2.3.1, 2.5.1, or 3.1 as noted. Messages may be consumed in different ways depending on the EHR's operation and workflows. It is not the intention of this specification to be prescriptive on how these messages will be consumed, only that they be received and used in a manner that fits with the EHR's intended workflows.

Topic	Preferred Message & Trigger	Do You Consume this Message?		
		YES, as Shown (Give Version)	Message, Version, & Trigger?	If not now, when?
A.1 Receive ADT Messages	A.1.1 ADT^A01 Hospital Admission			
	A.1.2 ADT^A03 Hospital Discharge			
	A.1.3 ADT^A04 Emergency Registration			
	A.1.4 ADT^A08 Demographic Update			
	A.1.5 ADT^A40 Patient Merge			
A.2 Receive HL7 Lab Results as Structured Data	A.2.1 ORU^R01 Store discrete value and text fields			
	A.2.2 Can consume LOINC test and analyte codes (required for Public Health MU reporting)			

Topic	Preferred Message & Trigger	Do You Consume this Message?		
		YES, as Shown (Give Version)	Message, Version, & Trigger?	If not now, when?
	A.2.3 Can use SNOMED-encoded results			
	A.2.4 Appropriately handle HL7 “no growth” and “preliminary” result messages and update the order status appropriately (OBR Result Status = I, S, A, P – and, depending upon usage, R).			
A.3 Receive HL7 Radiology Report	A.3.1 ORU^R01 Receive Radiology Report as HL7 ORU or MDM and file into the proper place in the EHR.			
A.4 Receive Corrected and Canceled HL7 Result Messages	A.4.1 Appropriately handle HL7 result correction messages (OBR Result Status = C) and order cancel messages received (OBR Result Status = X) and update the order status appropriately based on the message.			
A.5 Receive HL7 Text Reports: (e.g. H&P, ECG, Discharge Summary, Colonoscopy Report, Progress Notes)	A.5.1 MDM^T02: Original + content			
	A.5.2 MDM^T04: Status change + content			
	A.5.3 MDM^T06: Addendum + content			
	A.5.4 MDM^T08: Edit + content			
	A.5.5 MDM^T10: Replace + content			
	A.5.6 ORU^R01: Alternative method for receiving text reports (result status is in OBR)			
A.6 Receive HL7 Referral Request	A.6.1 REF^I12 Delivered to Provider in-box (should be able to handle RF1, DG1, AL1, OBR, and OBX segments). ORM^O01 may be used as an alternative.	Indicate which message & trigger		
A.7 Receive HL7 Referral Response	A.7.1 RRI^I12 Acknowledge Referral Request sent from the EHR (see HL7 Messages outbound)			

Topic	Preferred Message & Trigger	Do You Consume this Message?		
		YES, as Shown (Give Version)	Message, Version, & Trigger?	If not now, when?
A.8 Receive HL7 Request for Appointment	A.8.1 SRM^S01 Request New Appointment (please note if message is routed to the inbox, or whether the EHR can auto-book and acknowledge with an SIU^S12.			
A.9 Receive and Consume Summary of Care Document (CCD)	A.9.1 Receive and store a CCD C32 document as specified in the CDA Release 2.1 as further refined by HITSP in its component specification.		List the C32 sections supported.	
	A.9.2 Consume the discrete and textual sections of a CCD C32 document as specified in the CDA Release 2.1 as further refined by HITSP in its component specification.			
	A.9.3 Consume the discrete and textual sections of the CCD as detailed in the CCD specification available at <a href="http://www.interopwg.org/documents/request.html">http://www.interopwg.org/documents/request.html</a> including current medications.			
	A.9.4 Receive CCD via Direct Project standards			
	A.9.5 Receive CCD via IHE XDS.b standards as a Document Consumer			

## Section 2: HL7 Messages Outbound from EHR to HIE or Others

The EHR correctly generates and transmits to the HIE (or others) properly formatted HL7 ADT, MDM, MFN, ORM, ORU, VXU and SIU messages of version 2.3.1, 2.5.1, or 3.1 as noted.

Topic	Preferred Message & Trigger	Do you produce this Message?		
		YES, as Shown (Give Version)	Message, Version, & Trigger?	If not now, when?
B.1 Send Patient Encounter, Person Maintenance,	B.1.1 ADT^A04 Register Patient, Automatically generated upon completion of a registration process.			

Topic	Preferred Message & Trigger	Do you produce this Message?		
		YES, as Shown (Give Version)	Message, Version, & Trigger?	If not now, when?
and Patient Merge ADT Message	B.1.2 ADT^A04 (additional detail) EHR provides a mechanism for the user to mark a visit as “protected” and will transmit the protected status at the patient level in the PV1 segment.			
	B.1.3 ADT^A08 Update Patient Info			
	B.1.4 ADT^A31 - Person Update			
	B.1.5 ADT^A40 - Merge Patient			
B.2 Create and Send Order	B.2.1 ORM^O01 Create and transmit a properly formatted HL7 order (lab, radiology, other ancillary services).			
	B.2.2 For laboratory orders, the California “ELINCS” specification is supported			
	B.2.3 The ORM message allows a minimum of 3 “Copy to” providers			
B.3 Create and send HL7 Master File Updates for Providers and Locations	B.3.1 MFN^M02 Add/change/deactivate provider			
	B.3.2 MFN^M05 Update location			
B.4 Create and Send Appointment Notification	B.4.1 SIU^S12 (May be used to determine if the patient referenced in the appointment has information in the HIE)			
B.5 Create and Send Referral Request	B.5.1 REF^I12 Provide for the automatic transmission of the referral message. ORM^O01 also accepted at this time.	Indicate which message & trigger		
B.6 Create and Send Referral Response	B.6.1 RRI^I12 Acknowledge Referral Request			
B.7 Create and Send HL7 Result Records to Document in-Office or Reference Testing	B.7.1 ORU^R01 Laboratory			
	B.7.2 ORU^R01 Radiology / Ultrasound			
	B.7.3 MDM ^T02 Transcription			

Topic	Preferred Message & Trigger	Do you produce this Message?		
		YES, as Shown (Give Version)	Message, Version, & Trigger?	If not now, when?
B.8 Send Text Reports: (e.g. H&P, Visit Summary, Progress Notes, Chart Notes, Consult Notes)	B.8.1 MDM^T02: Original + content			
	B.8.2 MDM^T04: Status change + content			
	B.8.3 MDM^T06: Addendum + content			
	B.8.4 MDM^T08: Edit + content			
	B.8.5 MDM^T10: Replace + content			
	B.8.6 ORU^R01: Alternative method for sending text reports (result status is in OBR)			
B.9 Create & Send Immunization Messages.	B.9.1 VXU^V04 (2.3.1 or 2.5.1 required for MU) Code Set CVX - Vaccines Administered, July 30, 2009 version			
B.10 Automatically Trigger Creation of the CCD	B.10.1 Provide a configurable ability to automatically create and transmit the CCD. For details on the CCD, see specification below.		List which events can trigger production of the CCD.	
B.11 Single Sign-on (SSO) with HIE	B.11.1 EHR produces a SAML 2.0 authentication token certifying the user when calling out to the HIE.			
	B.11.2 EHR provides authorization criteria as required by California within the SAML token.			
B.12 Transfer Context and Control to HIE within EHR	B.12.1 EHR provides the ability to view content from an external web-based source such as an HIE within the framework of the EHR (e.g. a window inside the EHR), and will transfer the context of viewing to the external source through the URL as defined by the external source.		Provide specifics of capabilities including context objects transferred.	
B.13 Create and Send CCD	B.13.1 Create the discrete and textual sections of a CCD C32 document as specified in the CDA Release 2.1 as further refined by HITSP in its component specification.		List the C32 sections supported.	

Topic	Preferred Message & Trigger	Do you produce this Message?		
		YES, as Shown (Give Version)	Message, Version, & Trigger?	If not now, when?
	B.13.2 Create and transmit to the HIE a properly formatted CCD based on the CCD specification at <a href="http://www.interopwg.org/documents/request.html">http://www.interopwg.org/documents/request.html</a> .			
	B.13.3 Send CCD via Direct Project standards.			
	B.13.4 Send CCD via IHE XDS.b standards as a Document Source or Integrated Document Source Repository.			
B.14 Providing Electronic Summary to Patients	B.14.1 If via a CCD (see above), the EHR provides a viewer or style sheet so that the patient can read the contents of the electronic file provided. If not a CCD, please note what standard and format is used (e.g. CCR, Blue Button, text-only, etc.).			

### Section 3: Approach to Interfaces and Hosting

Interfaces and Hosting	Yes / No
Interface is integral to the EHR software. No additional hardware, software, or hosting components required.	
Interface is a separate software component. Software costs are included in the interface cost, but additional hardware may be required.	
Interface is a separate appliance. Hardware and software costs are included in the interface cost.	
Interface is a separate hosted service. Software and hosting services are included in the interface cost.	
Interface is a separate hosted service. Software is included in the interface cost however a hosting company MAY charge extra.	

EHR Vendor Name: \_\_\_\_\_

Interface & Interoperability Point of Contact:

Name: \_\_\_\_\_ Phone: \_\_\_\_\_ e-mail: \_\_\_\_\_

**Pricing Details:**

**EHR Vendor Catalog Orderable Kit Price per instance in California for any client on maintenance with EHR Vendor and on the currently supported product version for above items in the “YES – As Shown” Column:**

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**Annual Maintenance cost to the client:**

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## Appendix B: Hospital Electronic Medical Record (EMR / EHR)

The preferred version of HL7 that California is focused on supporting is version 2.5.1. We recognize that not all HIO's currently support this version, so we are also accepting, at this time, interfaces which conform to the HL7 version 2.3.1 specification. In the right-hand columns we are asking the vendor to list:

- **YES - as Shown (Give Version)** If you produce or consume the message with the trigger shown, please indicate which HL7 version.
- **Message, Version, & Trigger?** If you produce or consume a message that performs the same or similar function as the message and trigger shown, please note the message, trigger, and HL7 version.
- **If not now, when?** If you do not currently produce or consume the message and trigger indicated in either of the previous columns, please note when you expect to accommodate the message indicated. NO PLAN (to do this) is an acceptable answer.

### Section 1: HL7 Messages Inbound to EMR/EHR

The EMR/EHR receives and consumes from the HIE (or others) properly formatted HL7 ADT, MDM, ORU, REF, RRI, and SRM messages of version 2.3.1, 2.5.1, or 3.1 as noted. Messages may be consumed in different ways depending on the EMR/EHR's operation and workflows. It is not the intention of this specification to be prescriptive on how these messages will be consumed, only that they be received and used in a manner that fits with the EMR/EHR's intended workflows.

Topic	Preferred Message & Trigger	Do you consume this message?		
		YES, as shown (give version)	Message, Version, & Trigger?	If not now, when?
A.1 Receive Patient Encounter, Person Maintenance, and Patient Merge ADT Messages	A.1.1 ADT^A04 Register Patient from Ambulatory or ED setting.			
	A.1.2 ADT^A08 Update Patient Info			
	A.1.3 ADT^A31 Person Update			
	A.1.4 ADT^A40 Merge Patient			
	A.1.5 ADT^A01 Other Hospital Admission			
	A.1.6 ADT^A03 Other Hospital Discharge			

Topic	Preferred Message & Trigger	Do you consume this message?		
		YES, as shown (give version)	Message, Version, & Trigger?	If not now, when?
A.2 Receive HL7 Lab Results as Structured Data	A.2.1 ORU^R01 Store discrete value and text fields			
	A.2.2 Can consume LOINC test and analyte codes			
	A.2.3 Can use SNOMED-encoded results			
	A.2.4 Appropriately handle HL7 “no growth” and “preliminary” result messages and update the order status appropriately (OBR Result Status = I, S, A, P – and, depending upon usage, R).			
A.3 Receive HL7 Radiology Report	A.3.1 ORU^R01 Receive Radiology Report as HL7 ORU or MDM and file into the proper place in the EMR/EHR.			
A.4 Receive Corrected and Canceled HL7 Result Messages	A.4.1 Appropriately handle HL7 result correction messages (OBR Result Status = C) and order cancel messages received (OBR Result Status = X) and update the order status appropriately based on the message.			
A.5 Receive HL7 Text Reports: (e.g. H&P, ECG, Discharge Summary, H&P, Visit Summary, Progress Notes, Consult Notes, Other Hospital Discharge Summary, etc.)	A.5.1 MDM^T02: Original + content			
	A.5.2 MDM^T04: Status change + content			
	A.5.3 MDM^T06: Addendum + content			
	A.5.4 MDM^T08: Edit + content			
	A.5.5 MDM^T10: Replace + content			
	A.5.6 ORU^R01: Alternative method for receiving text reports (result status is in OBR)			
A.6 Receive HL7 Referral Request (may be used for preadmit)	A.6.1 REF^I12 Delivered to Provider in-box (should be able to handle RF1, DG1, AL1, OBR, and OBX segments). ORM^O01 may be used as an alternative.	Indicate which message & trigger		

Topic	Preferred Message & Trigger	Do you consume this message?		
		YES, as shown (give version)	Message, Version, & Trigger?	If not now, when?
A.7 Receive HL7 Referral Response	A.7.1 RRI^I12 Acknowledge Referral Request sent from an HIE (see HL7 Messages outbound)			
A.8 Receive HL7 Request for Appointment (ancillary services)	A.8.1 SRM^S01 Request New Appointment (please note if message is routed to the inbox, or whether the EMR/EHR can auto-book and acknowledge with an SIU^S12.			
A.9 Receive and Consume Summary of Care Document (CCD)	A.9.1 Receive and store a CCD C32 document as specified in the CDA Release 2.1 as further refined by HITSP in its component specification.		List the C32 sections supported.	
	A.9.2 Consume the discrete and textual sections of a CCD C32 document as specified in the CDA Release 2.1 as further refined by HITSP in its component specification.			
	A.9.3 Consume the discrete and textual sections of the CCD as detailed in the CCD specification available at <a href="http://www.interopwg.org/documents/request.html">http://www.interopwg.org/documents/request.html</a> including current medications.			
	A.9.4 Receive CCD via Direct Project standards			
	A.9.5 Receive CCD via IHE XDS.b standards as a Document Consumer			
A.10 Receive Electronic Orders	A.10.1 ORM^O01 Receive from an HIE or other source a properly formatted HL7 order (lab, radiology, other ancillary services).			
	A.10.2 For laboratory orders, the California "ELINCS" specification is supported			
	A.10.3 The EMR/EHR supports an ORM message with 3 or more "Copy to" providers			

Topic	Preferred Message & Trigger	Do you consume this message?		
		YES, as shown (give version)	Message, Version, & Trigger?	If not now, when?
A.11 Receive/ Consume HL7 Master File Updates for Providers and Locations	A.11.1 MFN^M02 Add/change/deactivate provider			
	A.11.2 MFN^M05 Update location			

## Section 2: HL7 Messages Outbound from EMR/EHR to HIE or Others

The EMR/EHR correctly generates and transmits to the HIE (or others) properly formatted HL7 ADT, MDM, MFN, ORM, ORU, VXU and SIU messages of version 2.3.1, 2.5.1, or 3.1 as noted. It is not the intention of this specification to be prescriptive on how these messages will be consumed or otherwise dealt with by the receiver, only that they be received and acknowledged in an appropriate manner, and that these messages can be managed by the receiver's workflows.

Topic	Preferred Message & Trigger	Do You Produce this Message?		
		YES, as Shown (give version)	Message, Version, & Trigger?	If not now, when?
B.1 Send ADT Messages	B.1.1 ADT^A01 Hospital Admission			
	B.2.1 ADT^A03 Hospital Discharge			
	B.1.3 ADT^A04 Emergency Registration			
	B.1.4 ADT^A08 Demographic Update			
	B.1.5 ADT^A40 Patient Merge			
	B.1.6 ADT^A04 Outpatient Visit Registration			
	B.1.7 ADT^A31 Person Update			
B.2 Create and Send Order	B.2.1 ORM^O01 Transmit a properly formatted HL7 order (lab, radiology, other ancillary services).			
	B.2.2 For laboratory orders the California "ELINCS" specification is supported			
	B.2.3 The ORM message allows a minimum of 3 "Copy to" providers			

Topic	Preferred Message & Trigger	Do You Produce this Message?		
		YES, as Shown (give version)	Message, Version, & Trigger?	If not now, when?
B.3 Create and Send HL7 Master File Updates for Providers and Locations	B.3.1 MFN^M02 Add/change/deactivate provider			
	B.3.2 MFN^M05 Update location			
B.5 Create and Send Referral Request	B.5.1 REF^I12, or ORM^O01 as an alternative.	Indicate which message & trigger		
B.6 Create and Send Referral Response	B.6.1 RRI^I12 Acknowledge Referral Request received from others			
B.7 Create and Send HL7 Lab Results as Structured Data	B.7.1 ORU^R01 Sends discrete value and text fields			
	B.7.2 Can send LOINC test and analyte codes (required for Public Health MU reporting)			
	B.7.3 Supports SNOMED-encoded results			
	B.7.4 Appropriately handle HL7 “no growth” and “preliminary” result messages and update the order status appropriately (OBR Result Status = I, S, A, P – and, depending upon usage, R).			
B.8 Send HL7 Text Reports: (e.g. H&P, ECG, Discharge Summary, Colonoscopy Report, Progress Notes, etc.)	B.8.1 MDM^T02: Original + content			
	B.8.2 MDM^T04: Status change + content			
	B.8.3 MDM^T06: Addendum + content			
	B.8.4 MDM^T08: Edit + content			
	B.8.5 MDM^T10: Replace + content			
	B.8.6 ORU^R01: Alternative method for sending text reports (result status is in OBR)			
B.9 Create & Send Immunization Messages	B.9.1 Transmit a VXU^V04 (2.3.1 or 2.5.1 required for MU) Code Set CVX - Vaccines Administered, July 30, 2009 version			

Topic	Preferred Message & Trigger	Do You Produce this Message?		
		YES, as Shown (give version)	Message, Version, & Trigger?	If not now, when?
B.10 Automatically Trigger Creation of the CCD	B.10.1 Provide a configurable ability to automatically create and transmit the CCD. For details on the CCD, see specification above.		List which events can trigger production of the CCD.	
B.11 Single Sign-on (SSO) with HIE	B.11.1 EMR/EHR produces a SAML 2.0 authentication token certifying the user when calling out to the HIE.			
	B.11.2 EMR/EHR provides authorization criteria as required by California within the SAML token.			
B.12 Transfer Context and Control to HIE within EMR/EHR	B.12.1 EMR/EHR provides the ability to view content from an external web-based source such as an HIE within the framework of the EMR/EHR (e.g. a window inside the EMR/EHR), and will transfer the context of viewing to the external source through the URL as defined by the external source.		Provide specifics of capabilities including context objects transferred.	
B.13 Generate and Send Summary of Care Document (CCD)	B.10.1 Generate and Send the discrete and textual sections of a CCD C32 document as specified in the CDA Release 2.1 as further refined by HITSP in its component specification.		List the C32 sections supported.	
	B.10.2 Generate and Send the discrete and textual sections of the CCD as detailed in the CCD specification available at <a href="http://www.interopwg.org/documents/request.html">http://www.interopwg.org/documents/request.html</a> including current medications.			
	B.10.3 Send the CCD via Direct Project standards			

Topic	Preferred Message & Trigger	Do You Produce this Message?		
		YES, as Shown (give version)	Message, Version, & Trigger?	If not now, when?
	B.10.4 Send the CCD via IHE XDS.b standards as a Document Source or Integrated Document Source Repository			
B.14 Providing Electronic Summary to Patients	B.12.1 If via a CCD (see above), the EMR/EHR provides a viewer or style sheet so that the patient can read the contents of the electronic file provided. If not a CCD, please note what standard and format is used (e.g. CCR, Blue Button, text-only, etc.).			
B.15 Send HL7 Radiology Report	B.15.1 ORU^R01 Send Radiology Report as HL7 ORU or MDM.			
B.16 Send Corrected and Canceled HL7 Result Messages	B.16.1 Send HL7 result correction messages (OBR Result Status = C) and send order cancel messages (OBR Result Status = X).			

### Section 3: Approach to Interfaces & Interoperability

Interfaces and Hosting	Yes / No
Interface is integral to the EHR software. No additional hardware, software, or hosting components required.	
Interface is a separate software component. Software costs are included in the interface cost, but additional hardware may be required.	
Interface is a separate appliance. Hardware and software costs are included in the interface cost.	
Interface is a separate hosted service. Software and hosting services are included in the interface cost.	
Interface is a separate hosted service. Software is included in the interface cost however a hosting company MAY charge extra.	

EMR/EHR Vendor Name: \_\_\_\_\_

**Interface & Interoperability Point of Contact:**

**Name:** \_\_\_\_\_ **Phone:** \_\_\_\_\_ **e-mail:** \_\_\_\_\_

**Pricing Details:**

**EMR/EHR Vendor Catalog Orderable Kit Price per instance in California for any client on maintenance with EMR/EHR Vendor and on the currently supported product version for above items in the "YES – As Shown" Column:**

\_\_\_\_\_

**Annual Maintenance cost to the client:**

\_\_\_\_\_

## Appendix B: Health Information Exchange Organization (HIO)

The preferred version of HL7 that California is focused on supporting is version 2.5.1. We recognize that not all HIO's currently support this version, so we are also accepting, at this time, interfaces which conform to the HL7 version 2.3.1 specification. In the right-hand columns we are asking the vendor to list:

- **YES - as Shown (Give Version)** If you produce or consume the message with the trigger shown, please indicate which HL7 version.
- **Message, Version, & Trigger?** If you produce or consume a message that performs the same or similar function as the message and trigger shown, please note the message, trigger, and HL7 version.
- **If not now, when?** If you do not currently produce or consume the message and trigger indicated in either of the previous columns, please note when you expect to accommodate the message indicated. NO PLAN (to do this) is an acceptable answer.

### Section 1: HL7 Messages Outbound from HIO

The HIO sends to the EHR (or others) properly formatted HL7 ADT, MDM, ORU, REF, RRI, and SRM messages of version 2.3.1, 2.5.1, or 3.1 as noted. Messages may be consumed in different ways depending on the recipient systems' operation and workflows. It is not the intention of this specification to be prescriptive on how these messages will be consumed by the recipient, only that they be sent.

Topic	Preferred Message & Trigger	Do You Send this Message?		
		YES, as Shown (give version)	Message, Version, & Trigger?	If not now, when?
A.1 Send ADT Messages	A.1.1 ADT^A01 Hospital Admission			
	A.2.1 ADT^A03 Hospital Discharge			
	A.1.3 ADT^A04 Emergency Registration			
	A.1.4 ADT^A08 Demographic Update			
	A.1.5 ADT^A40 Patient Merge			
	A.1.6 ADT^A04 Ambulatory Visit Registration			
	A.1.7 ADT^A31 Person Update			

Topic	Preferred Message & Trigger	Do You Send this Message?		
		YES, as Shown (give version)	Message, Version, & Trigger?	If not now, when?
A.2 Send HL7 Lab Results as Structured Data	A.2.1 ORU^R01 Sends discrete value and text fields			
	A.2.2 Can send LOINC test and analyte codes (required for Public Health MU reporting)			
	A.2.3 Supports SNOMED-encoded results			
	A.2.4 Appropriately handle HL7 “no growth” and “preliminary” result messages and update the order status appropriately (OBR Result Status = I, S, A, P – and, depending upon usage, R).			
A.3 Send HL7 Radiology Report	A.3.1 ORU^R01 Send Radiology Report as HL7 ORU or MDM.			
A.4 Send Corrected and Canceled HL7 Result Messages	A.4.1 Appropriately forward HL7 result correction messages (OBR Result Status = C) and send order cancel messages (OBR Result Status = X).			
A.5 Send HL7 Text Reports: (e.g. H&P, ECG, Discharge Summary, Colonoscopy Report, Progress Notes)	A.5.1 MDM^T02: Original + content			
	A.5.2 MDM^T04: Status change + content			
	A.5.3 MDM^T06: Addendum + content			
	A.5.4 MDM^T08: Edit + content			
	A.5.5 MDM^T10: Replace + content			
	A.5.6 ORU^R01: Alternative method for sending text reports (result status is in OBR)			
A.6 Send HL7 Referral Request	A.6.1 REF^I12, or ORM^O01 as an alternative.	Indicate which message & trigger		
A.7 Send HL7 Referral Response	A.7.1 RRI^I12 Acknowledge Referral Request sent from the EHR (see HL7 Messages outbound)			

Topic	Preferred Message & Trigger	Do You Send this Message?		
		YES, as Shown (give version)	Message, Version, & Trigger?	If not now, when?
A.8 Send HL7 Request for Appointment	A.8.1 SRM^S01 Request New Appointment			
A.9 Generate and Send Summary of Care Document (CCD)	A.9.1 Generate and Send the discrete and textual sections of a CCD C32 document as specified in the CDA Release 2.1 as further refined by HITSP in its component specification.		List the C32 sections supported.	
	A.9.2 Generate and Send the discrete and textual sections of the CCD as detailed in the CCD specification available at <a href="http://www.interopwg.org/documents/request.html">http://www.interopwg.org/documents/request.html</a> including current medications.			
	A.9.3 Send the CCD via Direct Project standards			
	A.9.4 Send the CCD via IHE XDS.b standards as a Document Source or Integrated Document Source Repository			
	A.9.5 Forward a CCD received from an EHR or other system to a designated recipient.			
A.10 Send Immunization Reports to Registry	A.10.1 VXU^V04 (2.3.1 or 2.5.1 required for MU) [Code Set CVX - Vaccines Administered, July 30, 2009 version]			
	A.10.2 Forward properly formatted immunization messages received from an EHR or other system to appropriate immunization registry.			
	A.10.3 The capability to accumulate numerous immunization records and submit them to immunization registry in batch format.			

Topic	Preferred Message & Trigger	Do You Send this Message?		
		YES, as Shown (give version)	Message, Version, & Trigger?	If not now, when?
A.11 Create and Send or Forward Order	A.11.1 ORM^O01 Forward a properly formatted HL7 order received from an EHR or other system (lab, radiology, other ancillary services).			
	A.11.2 ORM^O01 Generate from HIE services a properly formatted HL7 order (lab, radiology, other ancillary services).			
	A.11.3 For laboratory orders generated from HIE services, the California “ELINCS” specification is supported.			
	A.11.4 For orders generated from HIE services, the ORM message allows a minimum of 3 “Copy to” providers.			

## Section 2: HL7 Messages Inbound from EHRs and Other Data Suppliers to HIO

The HIO will receive, store, and forward, as appropriate to the particular use case and workflow, properly formatted HL7 ORU, ORM, MDM, MFN, ADT, , VXU and SIU messages of version 2.3.1, 2.5.1, or 3.1 as noted. It is not the intention of this specification to be prescriptive on how these messages will be consumed or otherwise dealt with by the receiving HIO, only that they be received and acknowledged by the HIO in an appropriate manner, and that these messages can be managed by the HIO’s workflows.

Topic	Preferred Message & Trigger	Do you use/consume this Message?		
		YES - As shown: give version:	Message, Version, & Trigger?	If not now, when?
B.1 Receive Patient Encounter, Person Maintenance, and Patient	B.1.1 ADT^A04 Register Patient from Ambulatory setting.			
	B.1.2 ADT^A04 (additional detail) HIO to correctly support a visit marked as “protected” in the PV1 segment.			

Topic	Preferred Message & Trigger	Do you use/consume this Message?		
		YES - As shown: give version:	Message, Version, & Trigger?	If not now, when?
Merge ADT Messages	B.1.3 ADT^A08 Update Patient Info			
	B.1.4 ADT^A31 Person Update			
	B.1.5 ADT^A40 Merge Patient			
	B.1.6 ADT^A01 Hospital Admission			
	B.1.7 ADT^A03 Hospital Discharge			
B.2 Receive Orders	B.2.1 ORM^O01 Receive from an EHR a properly formatted HL7 order (lab, radiology, other ancillary services).			
	B.2.2 For laboratory orders, the California "ELINCS" specification is supported			
B.3 Consume HL7 Master File Updates for Providers and Locations	B.3.1 MFN^M02 Add/change/deactivate provider			
	B.3.2 MFN^M05 Update location			
B.4 Receive Appointment Notification	B.4.1 SIU^S12 (May be used to determine if the patient referenced in the appointment has information in the HIE)			
B.5 Receive Referral Request	B.5.1 REF^I12 Referral message. ORM^O01 also accepted at this time.	Indicate which message & trigger		
B.6 Receive Referral Response	B.6.1 RRI^I12 Acknowledge Referral Request			
B.7 Receive/ Consume HL7 Result Records	B.7.1 ORU^R01 Laboratory			
	B.7.2 ORU^R01 Radiology / Ultrasound			
	B.7.3 MDM ^T02 Transcription			
B.8 Receive/ Consume Text Reports (e.g. H&P, visit summary, progress notes, chart notes, consult notes)	B.8.1 MDM^T02: Original + content			
	B.8.2 MDM^T04: Status change + content			
	B.8.3 MDM^T06: Addendum + content			
	B.8.4 MDM^T08: Edit + content			

Topic	Preferred Message & Trigger	Do you use/consume this Message?		
		YES - As shown: give version:	Message, Version, & Trigger?	If not now, when?
	B.8.5 MDM^T10: Replace + content			
	B.8.6 ORU^R01: Alternative method for receiving text reports (result status is in OBR)			
B.9 Receive/ Consume Immunization Messages	B.9.1 VXU^V04 (2.3.1 or 2.5.1 required for MU) Code Set CVX - Vaccines Administered, July 30, 2009 version			
B.11 Single Sign-on (SSO) with HIE	B.11.1 HIO supports SAML 2.0 authentication for authorized users			
	B.11.2 HIO consume authorization criteria as required by California within the SAML token.			
B.12 Transfer Context to HIO from EHR	B.12.1 HIO provides the ability to receive portal control from the EHR via a specific API or URL with context (provider, patient, subject) and will automatically query and display the requested subject.		Provide specifics of capabilities including context objects transferred.	
B.13 Receive and Consume CCD	B.13.1 Receive and store a CCD C32 document as specified in the CCD Release 2.1 as further refined by HITSP in its component specification.		List the C32 sections supported.	
	B.13.2 Consume the discrete and textual sections of a CCD C32 document as specified in the CDA Release 2.1 as further refined by HITSP in its component specification.			
	B.13.3 Consume a properly formatted CCD based on the CCD specification at <a href="http://www.interopwg.org/documents/request.html">http://www.interopwg.org/documents/request.html</a>			
	B.13.4 Receive the CCD via Direct Project standards			
	B.13.5 Request and receive the CCD via IHE XDS.b standards as a Document Consumer			

### Section 3: Approach to Interfaces & Interoperability and Business Relationship

#### *Basic HIO Information*

HIO Name: \_\_\_\_\_

HIE Tool Vendor Name: \_\_\_\_\_

#### *Points of Contact*

Interface & Interoperability Point of Contact (for vendors):

Name: \_\_\_\_\_ Phone: \_\_\_\_\_ e-mail: \_\_\_\_\_

Executive Director Point of Contact:

Name: \_\_\_\_\_ Phone: \_\_\_\_\_ e-mail: \_\_\_\_\_

Business Development Director (or other contact for establishing a business relationship with the HIO):

Name: \_\_\_\_\_ Phone: \_\_\_\_\_ e-mail: \_\_\_\_\_

#### *HIO Demographics*

Geographic Coverage: \_\_\_\_\_

Number of providers within the geographic region: \_\_\_\_\_

Number of hospitals within the geographic region: \_\_\_\_\_

#### *Onboarding & Pricing (fill out or provide link or attachment as appropriate)*

Link or contact information for an ambulatory EHR user wishing to establish a business relationship to exchange data with the HIO: \_\_\_\_\_

Interface Fee charged by the HIO to implement and test an ambulatory EHR to the base level in Exhibit A: \$ \_\_\_\_\_

Ongoing interface fee structure, if any: \$ \_\_\_\_\_

Description/definition of interface fee structure: \_\_\_\_\_

\_\_\_\_\_

## APPENDIX C—SCORING ALGORITHMS

Each vendor or organization participating in *HIE Ready* has provided information about the interoperability capabilities its offering supports. The more than 50 such capabilities are grouped and categorized into the capability categories found in the Buyers' Guide.

### Capabilities Scoring

The score for a category is calculated by computing the percentage of supported capabilities in each group, averaging the percentages for all groups in a category, and scaling the result from zero to four points. Specifically, four times the mean percentage is computed and rounded to the nearest whole value.

↑ Capability	●●●●	>87.5% to 100%
	●●●	>62.5% to 87.5%
	●●	>37.5% to 62.5%
	●	>12.5% to 37.5%
	○	0% to 12.5%

For example, there is one group of five inbound capabilities and one group of five outbound capabilities for the "ADT/Demographics" category for ambulatory EHRs. If a product supports three of the inbound and four of the outbound capabilities, its score would be the average of 60% and 80%, which is 70% = 3 points.

### Relative Cost Scoring

*HIE Ready* relative costs are computed based on the information most entities provided. For this computation, each vendor or organization participating in *HIE Ready* provided cost information for the *HIE Ready* capabilities it supports. Some vendors include *HIE Ready* as part of the base cost of their offering, so their cost is \$0. However, *HIE Ready* carries some additional cost for many products. For these, the number of dollar signs is calculated by taking the mean price for all vendors as a score of 2.5, and subtracting one for each standard deviation below the mean, or adding one for each standard deviation above the mean, and rounding to the nearest whole value. Some vendors declined to set a specific price for *HIE Ready*; their relative price is listed as NP (not provided).

### Updating the Guide and Scoring Changes

We note that the *HIE Ready* Buyers' Guide will be updated each time a new vendor or organization joins *HIE Ready*, or each time a vendor or organization updates its product capabilities. If a capability score changes, it means a vendor's product has changed. If a relative price score changes, it may mean that the vendor has changed its pricing or that new vendors have been added to the Buyers' Guide changing the mean cost, which potentially changes each vendor's score.