INTEGR8 SPECIFICATION GUIDE

CLINICAL DOCUMENT INTERFACE

CDA/CCD EXCHANGE THROUGH THE INTEGR8 EMR INTEGRATION ENGINE

V19.07.03

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Introduction

General Information

This guide contains an overview of how Pulse8 utilizes its Integr8 EMR Integration platform to send and receive clinical Continuity of Care Documents using the Health Level Seven International standard Clinical Document Architecture R2 format.

The Integr8 Clinical Document Interface is used to send or receive clinical information based on identified conditions. This document is divided into technical specifications outlining general concepts and data requirements. Custom specification information is available in Appendix A.

Acknowledgements

This documentation was developed and produced using a variety of industry standard data exchange structures in compliance with guidance provided by the Centers for Disease Control and Prevention.

The material includes content from the following organizations:

- Health Level 7 (HL7) Structured Documents Working Group. (http://www.hl7.org/implement/standards/product_brief). CDA and RIM are the registered trademark of Health Level Seven International.
- SNOMED CT® (http://www.ihtsdo.org/snomedct). SNOMED CT is a registered trademark of the International Health Terminology Standard Development Organization (IHTSDO).
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- phiMail® is a registered trademark of EMR Direct (http://www.emrdirect.com).

Definitions

- XML - Extensible Markup Language (**XML**) is a set of open source rules for defining encoded documents published by the World Wide Web Consortium.
- XDM – XQuery Data Model (**XDM**) is an open file format used to embed metadata for XML document handling.
- RIM - Refers to the HL7 Reference Information Model (**RIM**), the vocabulary that defines the semantical and lexical connections in HL7 v3 XML information.
- CDA - Clinical Document Architecture (**CDA**) is a flexible XML-based documentation markup standard developed under the Structured Documents Working Group of the HL7 organization. The syntax of the CDA provides a framework under HL7 RIM for sending any relevant clinical information in a patient's medical record. CDA documents are divided into interpretive text sections and structured sections.
- CCD - The Continuity of Care Document (**CCD**) is a subset of the CDA specific to U.S. healthcare. The CCD typically contains a summary of patient demographics, provider details and sections of clinical information representing an aggregated snapshot of a patient's medical record.
- OID - Object Identifiers (**OID**) are unique nodes in a standardized global identity tree. HL7 assigned OIDs are used extensively in defining CDA/CCD objects. (https://www.hl7.org/oid/)

- ICD - The International Classification of Diseases **(ICD)** is a standard diagnostic tool for epidemiology, health management and clinical purposes that is maintained by the World Health Organization (WHO). (https://www.who.int/classifications/icd/en/)

- HCC – Hierarchical Condition Category Coding **(HCC)** is a risk adjusted coding system developed by the Centers for Medicare & Medicaid Services (CMMS) to pay insurance companies based on demographics and the disease burden on beneficiaries. https://www.cms.gov/Medicare/Health-Plans/MedicareAdvtgSpecRateStats/Risk-Adjustors-Items/CPT-HCPCS.html

- Direct Project – A simple, secure, and scalable standards-based method for sending authenticated and encrypted health information over the internet between trusted recipients. The project was developed by the Nationwide Health Information Network in 2010.

- HISP – Health Internet Service Provider (**HISP**) maintains the direct email address and routes the direct messages between organizations.

Data Guidelines

Accurate analytics depend on data that are complete, accurate, and timely. This document defines the fields utilized by Pulse8 to report analytics and quality information by exchanging a standard format CCD with your EMR vendor. Included in this data set are both clinical data and identifying information that can be used to match patients within your EMR software.

Pulse8 has the capability to flexibly send and receive data in multiple formats. Clients unable to accept the required fields in their CCDs, or unable to match to an existing patient using the provided data set should notify their Pulse8 contact.

Data Elements

The below data table describes the minimum data elements Pulse8 has determined are necessary for successful integration of CCD documents produced by Integr8 for consumption by receiving EMR systems. Additional data elements may be added as required by the particular EMR vendor or workflow needs of the consuming system. Please work with your Pulse8 integration contact to refine your data needs and the Integr8 team will attempt to accommodate them if access to the required data exists.

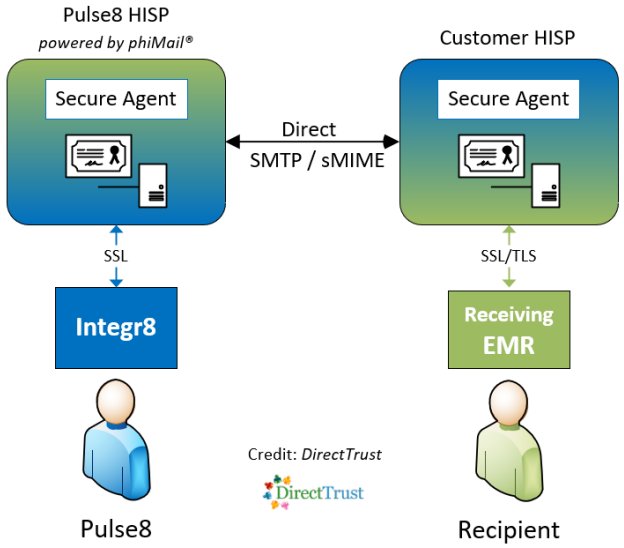
Field	Name	Cardinality	Optionality	Comment
Patient Header				
1	assigningAuthority	1	R	*Designates the OID to use for the patient ID*
2	identifier	1	R	*Unique Patient Identifier*
3	firstName	1	R	
4	lastName	1	R	
5	gender	1	O	*This set of fields are not individually required. However, it is assumed that some combination of these data elements will be required for patient matching in the receiving system. Integr8 will send all available data, but the integration teams of the partnering systems will need to work closely to determine what threshold for patient matching must be met by the interface.*
6	dateofBirth	1	O	
7	address1	1	O	
8	address2	1	O	
9	city	1	O	
10	State	1	O	
11	Zip	1	O	
12	homePhone	1	O	
13	cellPhone	1	O	
14	workPhone	1	O	
Document Header				
1	authorDate	1	R	*The date the report was generated.*
2	authorID	1	R	*NPI or other ID of author or 'INTEGR8'*
3	representedOrganization	1	R	*Name of sending system, or 'PULSE8'*

4	serviceStartDate	1	R	
5	serviceEndDate	1	R	
6	performerAssignedID	1	R	*NPI or other ID. Data may also be used for Direct routing.*
7	performerLast	1	O	
8	performerFirst	1	O	
9	nextAppointment	1	O	
Document Body				
1	entryNotedDate	1..n	R	*The date when the condition was first noted*
2	entryUpdatedDate	1..n	R	*Last known note of condition (defaults to entryNotedDate)*
3	entryValueCode	1..n	R	*Industry code for recorded condition*
4	entryValueCodeSystem	1..n	R	*'ICD10'*
5	entryDisplayName	1..n	R	*Long name of coded condition*
6	entrySource	1..n	R	*Record source from which Pulse8 captured the condition*
7	problemStatus	1..n	R	

Communications

General Considerations

The Direct Messaging standard allows for the easy facilitation of patient data exchange between unrelated systems by using encrypted messaging between 2 HISP systems over the internet. Pulse8 has partnered with EMR Direct to utilize their phiMail® product as a source system. When operating at the source system, the Integr8 platform will construct CCD documents in XML format and transmit the result through our HISP to the receiving system's HISP.



Response Handling

Integr8 will attempt to retrieve inbound response messages from the consuming HISP and use this data to match the originating message in our database for auditing purposes. The customer should request that ack/nak responses be enabled with their HISP for this workflow.

Outbound Message Format

General Considerations

Pulse8 transmits the minimum data necessary for successful processing. Only the CCD sections necessary for patient matching, document handling, and the specific data included in the Conditions List will be sent by default. Integr8 will transmit the message as raw XML so that the customer's HISP can create an appropriate XDM packet for final delivery to the receiving EMR software. For additional data elements, or document formatting options, please consult your Pulse8 integration contact to determine what customization can be accommodated.

CCD XML Tree

```
<ClinicalDocument>
        <recordTarget>
                <patientRole>
                        <patient>
                        <providerOrganization>
                </patientRole>
        </recordTarget>
        <author>
                <time>
                <assignedAuthor>
                        <representedOrganization>
                </assignedAuthor>
        </author>
        <custodian>
                <assignedCustodian>
                        <representedCustodianOrganization>
                </assignedCustodian>

        </custodian>
        <docuemntationOf>
                <serviceEvent>
                        <effectiveTime>
                        <performer>
                                <functionCode>
                                <time>
                                <assignedfEntity>
                                        <assignedPerson>
                                        <representedOrganization>
                                </assignedEntity>
                        </performer>
                </serviceEvent>
        </documentationOf>
        <component>
                <structuredBody>
                        <component>
                                <section>
                                        <text>
                                                <table></table>
                                        </text>
                                        <entry>
                                                <entryRelationship>
                                                        <observation>
                                                </entryRelationship>
                                        </entry>
                                </section>
                        </component>
                </structuredBody>
        </component>
</ClinicalDocument>
```

Template Overview

Unless noted by brackets [], these values are static or set by environmental conditions such as date/time and generated message GUIDs. Refer to the Data Elements section above for information about the data fields listed inside brackets [].

Message Meta Data

EMAIL_TO_ADDRESS	*Recipient email address*
EMAIL_SUBJECT	*From connection "name"*
EMAIL_FROM_ADDRESS	*Integr8 email address (prod or cert)*
EMAIL_MESSAGE_ID	*Integr8 Generated GUID – Should be returned in response*
EMAIL_CONTENT_TYPE	*text/xml*

Document Header

ClinicalDocument xmlns:="urn:hl7-org:v3" xmlns:ep3="http://www.w3.org/2001/XMLSchema-instance" ep3:schemaLocation="urn:hl7-org:v3 CDA.xsd"	
realmCode	US
typeID	root="2.16.840.1.113883.1.3" extension="POCD_HD000040"
templateID	"2.16.840.1.113883.10.20.1"
id	*GUID*
code	code="34133-9" codeSystem="2.16.840.1.113883.6.1" codeSystemName="LOINC" displayName="Continuity of Care Document"
title	Conditions for Consideration
effectiveTime	*Current*
languageCode	en-US

recordTarget

patientRole	
Id	root="2.16.840.1.113883.19" extension="[identifier]" assigningAuthorityName="[assigningAuthority] "
\addr	
streetAddressLine	[address1]/[address2]
state	[state]
city	[city]
postalCode	[zip]
\telecom	
home	Use="HP" [homePhone]
mobile	Use ="MC" [cellPhone]
work	Use="WP" [workPhone]
\patient	
given	[firstName]
family	[lastName]
administraiveGenderCode	code="[gender]" codeSystem="2.16.840.1.113883.5.1"
birthTime	"[dateofBirth]"
\providerOrganization	
id	root="2.16.840.1.113883.19"
name	*Customer Name*

author

time	[authorDate]
assignedAuthor	
id	extension="INTEGR8"
representedOrganization	
id	root="2.16.840.1.113883.19.5"
name	"PULSE8"

custodian

assignedCustodian	
\representedCustodianOrganization	
id	root = "2.16.840.1.113883.19.5"
name	"PULSE8"

documentationOf

	typeCode="DOC"
serviceEvent	classCode="PCPR"
\effectiveTime	high value="[authorDate]"
\performer	code="PCP" codeSystem="2.16.840.1.113883.12.443" codeSystemName="Provider Role" displayName="Primary Care Provider"
\time	high value="[authorDate]"
\assignedEntity	root="2.16.840.1.113883.19" extension="[authorID]"
\assignedPerson	
name	"[performerLast], [performerFirst]"
representedOrganization	
id	root="2.16.840.1.113883.19.5"
name	"Customer Name; [nextAppointment]"

component

structuredBody\component\section\component\section	typeCode="DOC"
templateID	root="2.16.840.1.113883.10.20.1.11"
templateID	root="1.3.6.1.4.1.19376.1.5.3.1.3.6"
templateID	root="2.16.840.1.113883.3.88.11.83.103"
id	GUID
code	code="11450-4" codeSystem="2.16.840.1.113883.6.1" codeSystemName="LOINC" displayName="Problem List"
title	Active Problems
name	"[performerLast], [performerFirst]"
\text	
thead	Problem|Noted Date
tbody	ID="problem1name" [entryDisplayName] | [entryNotedDate]
\entry	*** Repeating list *****
\act	classCode="ACT" moodCode="EVN"
templateID	root="2.16.840.1.113883.10.20.1.27"
templateID	root="1.3.6.1.4.1.19376.1.5.3.1.4.5.1"
templateID	root="1.3.6.1.4.1.19376.1.5.3.1.4.5.2"
templateID	root="2.16.840.1.113883.3.88.11.32.7"
templateID	root="2.16.840.1.113883.3.88.11.83.7"
id	root="1.2.840.114350.1.13.5325.1.7.2.768076" extension="concern"
code	nullFlavor="NA"
effectiveTime	[entryUpdatedDate]
\entryRelationship	typeCode="SUBJ" inversionInd="false
\observation	classCode="OBS" moodCode="EVN"
templateID	root="1.3.6.1.4.1.19376.1.5.3.1.4.5"
templateID	root="2.16.840.1.113883.10.20.1.28"
id	root="1.2.840.114350.1.13.5325.1.7.2.768076"
code	code="64572001" codeSystem="2.16.840.1.113883.6.96" codeSystemName="SNOMED CT"
text	value="#problem(n)name"
statusCode	code="completed"
effectiveTime	[entryNotedDate]
value	ep3:type="CD" code="[entryValueCode]" codeSystem="2.16.840.1.113883.6.90" codeSystemName="[entryValueCodeSystem]"

\entryRelationship	typeCode="REFR"
\observation	classCode="OBS" moodCode="EVN"
templateID	root="2.16.840.1.113883.10.20.1.50"
templateID	root="2.16.840.1.113883.10.20.1.57"
templateID	root="1.3.6.1.4.1.19376.1.5.3.1.4.1.1"
code	code="33999-4" codeSystem="2.16.840.1.113883.6.1" displayName="Status"
text	value="#problem(n)name"
statusCode	code="completed"
effectiveTime	[entryNotedDate]
value	ep3:type="CE" code="55561003" codeSystem="2.16.840.1.113883.6.96" displayName="[problemStatus]"

Sample Messages

Due to the size and complexity of the CCD document XML, sample messages are not included with this specification. Samples may be provided directly upon request to a Pulse8 integration contact.

Inbound Message Format

General Considerations

When consuming CCD documents, Integr8 will only extract the minimum data necessary for integration purposes. Any field or Section not described below will be discarded upon receipt and will not be stored by Pulse8. In general, Integr8 is designed to consume CCD documents using the HL7 Normative Edition CDA (R2). The data elements below are listed by the location in the standard XML tree where Integr8 will expect them by default. If any customization is required, please contact your Pulse8 integration team so that the requirement can be assessed.

Minimum Data Requirements

Field	Name	Cardinality	Optionality	Comment
Patient Identifiers				
1	Assigning Authority	1	R	*OID or code for patient ID type*
2	Patient Identifier	1	R	*Unique Patient Identifier*
3	First Name	1	R	
4	Last Name	1	R	
5	Administrative Sex	1	O	*As many of these fields should be sent as are available. Messages without these fields will not be rejected, however this data set will be important in patient matching if Pulse8 does not have an external patient ID to return in any results.*
6	Date of Birth	1	O	
7	Address Line 1	1	O	
8	Address Line 2	1	O	
9	City	1	O	
10	State	1	O	
11	Zip	1	O	
12	Home Phone	1	O	
13	Cell Phone	1	O	
14	Work Phone	1	O	

Inbound CCD Document Sections List

The following CCD sections have been identified to contain information that may be used for data integration and analytics.

Name	Cardinality	Optionality	Comment
Active Problems	1	R	*Contains all active problems in a table format.*
Additional Health Concerns	0..1	O	*Contains health status, assessments, and vitals of concern.*
Administered Medications	0..1	O	*Contains encounter medications, dose, route, and rate.*
Advance Directives	0..1	O	*Contains contact and organizational details for advanced directives.*
Allergies	0..1	O	*Contains any noted allergies.*
Consult Notes	0..1	O	*Contains all completed consult notes for the encounter.*
Current Medications	0..1	O	*Contains all current medications that the patient is taking in a table.*
Discharge Instructions	0..1	O	*Contains instructions and notes given at discharge to the patient.*
Discharge Summaries	0..1	O	*Contains Discharge Summary of most recent encounter*
ED Notes	0..1	O	*Contains ED Notes for documented emergency visits.*
Encounters	0..1	O	*Contains encounter detail for current and recent encounters.*
Functional Status	0..1	O	*Contains details of patient cognitive, sensory, and mobility status.*
Goals	0..1	O	*Contains patient goals detailed by clinician and patient.*
H&P Notes	0..1	O	*Contains History and Physical notes for patient encounter.*
Immunizations	0..1	O	*Contains details of immunizations administered to patient.*
Implants	0..1	O	*Contains information about any patient implants.*
Insurance	0..1	O	*Contains encounter, patient, and patient guarantor plan information.*
Miscellaneous Notes	0..1	O	*Contains all other encounter notes not contained in other sections.*
Nursing Notes	0..1	O	*Contains completed nursing notes for the encounter.*
OR Notes	0..1	O	*Contains completed and signed surgery related notes for the encounter.*
Plan of Treatment	0..1	O	*Contains details on upcoming encounters, results pending, referrals, health maintenance details, and care coordination notes.*
Procedure Notes	0..1	O	*Contains all procedure notes, orders, and diagnoses for the encounter.*
Procedures	0..1	O	*Contains encounter and recent completed procedures, including surgical.*
Progress Notes	0..1	O	*Contains completed progress notes for the encounter.*
Reason for Referral	0..1	O	*Contains incoming and outgoing referrals for the encounter.*
Reason for Visit	0..1	O	*Contains reasons patient sought treatment and clinician comments.*
Resolved Problems	0..1	O	*Contains resolved problems, comments, and assessment & plan notes.*
Results	0..1	O	*Contains resulted procedures notes, values, narratives, and other details.*
Social History	0..1	O	*Contains details of substance use, gender identity, and pregnancy status.*
Source Comments	0..1	O	*Contains legal disclaimers or top-level notes for providers.*
Visit Diagnoses	0..1	CR	*Contains encounter level diagnoses, with primary diagnosis flagged.*
Vital Signs	0..1	O	*Contains patient vitals for the encounter such as blood pressure, BMI, pulse, oxygen, height, and weight.*

Example CCD XML Tree

This is a sample tree based on the HL7 normative edition R2 CDA specification. 'Active Problems' is always required in the structured body components. 'Visit Diagnosis' should also be included when available.

```
<ClinicalDocument>
        <recordTarget>
                <patientRole>
                        <addr>[Address Components]</addr>
                        <telecom>[Telephone List]</</telecom>
                        <patient>[Patient Demographics]</</patient>
                </patientRole>
        </recordTarget>
        <component>
                <structuredBody>
                        <component>
                                <section>
                                        <title>"Source Comments"</title>
                                        <text>[Comments]</text>
                                </section>

                                <section>
                                        <title>"Allergies"</title>
                                        <text>
                                                <table>[Allergy List]</table>
                                        </text>
                                </section>

                                <section>
                                        <title>"Medications"</title>
                                        <text>
                                                <table>[Current Medications]</table>
                                        </text>
                                </section>

                                <section>
                                        <title>"Active Problems"</title>
                                        <text>
                                                <table>[Problem List]</table>
                                        </text>
                                        <entry>[Problem Details]</entry>
                                </section>

                                <section>
                                        <title>"Encounters"</title>
                                        <text>
                                                <table>[Encounter List]</table>
                                        </text>
                                        <entry>[Encounter Details]</entry>
                                </section>

                                <section>
                                        <title>"Immunizations"</title>
                                        <text>
                                                <table>[Immunization List]</table>
                                        </text>
                                        <entry>[Immunization Details]</entry>
                                </section>

                                <section>
                                        <title>"Results"</title>
                                        <entry>[Results]</entry>
                                </section>
                        </component>
                </structuredBody>
        </component>
</ClinicalDocument>
```

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Information prepared by Pulse8 for its Clients:
Internal Use and Distribution Only.

Appendix A – Specification

General Details	
Client Name	Optima Health Plan
EMR Vendor	Epic Systems
EMR Product	Care Everywhere
Data Type	C-CDA CCD

Communication Parameters	
Communication Type	Direct Project
Direction	Inbound
Pulse8 Addresses	
Production	*integr8@direct.pulse8.com*
Test	*integr8-smtp@test.directproject.net*
Optima Addresses	
Production	<>
Test	<>

Data Exchange	
Basic Data Set	Inbound CCD *(page 9)*
Trigger Event	*"Push Documents at Encounter Close"*
Epic Fields (Section)	
(Active Problems)	**Problem ID** - *Epic LPL.1*
(Active Problems)	**Diagnosis ID** - *Epic EDG.1*
Epic CCD Specification	C-CDA CCD with Encounter Data Patient and Encounter Level
Document Section List	** Section names may vary slightly depending on the version of Epic in use **
Active Problems	*Automatically Included*
Additional Health Concerns	*Automatically Included*
Advance Directives	*Enable in CareEverywhere*
Allergies	*Automatically Included*
Consult Notes	*Enable in CareEverywhere*
Discharge Instructions	*Automatically Included*
Discharge Summaries	*Automatically Included*
ED Notes	*Automatically Included*
Encounters	*Automatically Included*

Functional Status	*Automatically Included*
Goals	*Automatically Included*
H&P Notes	*Enable in CareEverywhere*
Immunizations	*Automatically Included*
Implants	*Automatically Included*
Insurance	*Automatically Included*
Medications - Administered	*Automatically Included*
Medications – Current	*Automatically Included*
Medications - Discontinued	*Enable in CareEverywhere if available*
Miscellaneous Notes	*Enable in CareEverywhere*
Nursing Notes	*Enable in CareEverywhere*
OR Notes	*Enable in CareEverywhere*
Plan of Treatment	*Automatically Included*
Procedure Notes	*Automatically Included*
Procedures	*Enable in CareEverywhere*
Progress Notes	*Automatically Included*
Reason for Referral	*Automatically Included*
Reason for Visit	*Automatically Included*
Resolved Problems	*Automatically Included*
Results	*Contains procedures notes, values, narratives, imaging, lab values, and other details*
Social History	*Automatically Included*
Source Comments	*Automatically Included*
Visit Diagnoses	*Automatically Included*
Vital Signs	*Automatically Included*

NOTES:

Please note that Puls8 is dependent on the number of data years available within your production/replicated EPIC databases.