# EMR EHR Connectivity

## Context Management – Requirements

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## Table of Contents

**1. INTRODUCTION ..... 3**

1.1 OVERVIEW ..... 3
1.2 VERSION HISTORY ..... 3
1.3 SCOPE ..... 3
*1.3.1 In Scope ..... 3*
*1.3.2 Out of Scope ..... 3*
1.4 CONSTRAINTS ..... 4
1.5 DEPENDENCIES ..... 4
1.6 RELATED DOCUMENTS, REFERENCES AND SOURCES ..... 4

**2. EMR REQUIREMENTS ..... 5**

2.1 CMS CONNECTIVITY ..... 6
2.2 CONTEXT DATA SUBMISSION ..... 6
2.3 CONTEXT-AWARE EHR SERVICE ..... 8
2.4 CONTEXT SHARING PARAMETERS ..... 9
2.5 CONTEXT SYNCHRONIZATION ..... 10
2.6 NOTIFICATIONS FOR CONTEXT-AWARE EHR SERVICE ..... 11
2.7 AUDITING AND LOGGING ..... 13
2.8 ERROR MANAGEMENT ..... 14

# 1. INTRODUCTION

## 1.1 Overview

This document defines the requirements and provides guidance for an EMR Offering to integrate with context management functionality. The integration allows for interaction with Context-Aware EHR Services or Viewlet available on the provincial ONE Access Gateway (OAG) that leverages context management (e.g., EHR service, web-based clinical viewers, Viewlets). The intended audiences of this document are business and technical implementers.

## 1.2 Version History

| VERSION | REVISION DATE | REVISION NOTES |
|---|---|---|
| 1.0 | 2019-12-23 | The initial release of Context Management requirements. |
| 1.1 | 2020-07-13 | a) Added CM01.03, CM01.04, CM01.05 for CMS parameters needed to launch an EHR Service.<br>b) Updated CMS02.03 to reflect a more current reference to CMS parameters.<br>c) Added CM02.05 to reference scopes associated with the Context Management Service. |
| 2.0 | 2020-11-09 | a) Added CM01.01 for extraction and use of CMS endpoint values. This functionality existed in Viewlet Framework requirements and was moved to Context Management requirements instead.<br>b) Re-sequenced all requirement numbers to account for the addition of CM01.01.<br>c) Updated reference to OHDS Viewlet Framework, which is now accessible online.<br>d) Added CM05.03 for clearing patient context upon closing an EHR Service or Viewlet. |
| 2.1 | 2021-03-04 | Published Specification as Draft for Comment (DFC). |
| 2.2 | 2021-04-09 | Updated reference to ONE Access Viewlet Framework (version). |
| 2.2 | 2021-05-21 | EMR Specification released as Draft for Use (DFU). |

## 1.3 Scope

### 1.3.1 In Scope

- EMR requirements for unidirectional context sharing from an EMR Offering to an EHR product or service, or Viewlet available on the OAG.
- Patient context, to identify a unique patient.

### 1.3.2 Out of Scope

- Bi-directional context sharing.

- Other context topics, such as provider context, may be supported in the future.
- Patient context sharing implementation from previous initiatives.

## 1.4 Constraints

- Although there are similarities, this document is not intended to be backwards compatible to support the Context Management Service (CMS) 1.0 implementation of patient context sharing.

## 1.5 Dependencies

- The endpoint for the CMS provided by a Context-Aware EHR service to the EMR Offering to set context is part of the OAuth2 interaction. To facilitate this interaction, the EMR Offering needs to align with the OAG requirements of the EMR EHR Connectivity Specification.

## 1.6 Related Documents, References and Sources

| ID | NAME | VERSION | DATE |
|---|---|---|---|
| 1 | Ontario Context Management System HL7 FHIR Implementation Guide (Ontario Health Digital Services, 2019)<br>https://www.ehealthontario.on.ca/en/standards/view/ontario-cms | 0.1.0 | 2019-12-02 |
| 2 | ONE Access Viewlet Framework (Ontario Health Digital Services, 2021)<br>https://www.ehealthontario.on.ca/en/standards/view/one-access-viewlet-framework-developer-guide | 1.7 | 2021-03 |

## 2. EMR REQUIREMENTS

This section consists of the EMR functional requirements for leveraging Context Management.

Support:

**M** = Mandatory. EMR offerings certified for this specification MUST support this requirement.
**O** = Optional. EMR vendors MAY choose to support this requirement in their certified EMR offering.

Status:

**N** = New requirement for this EMR Specification version.
**P** = Previous requirement.
**U** = Updated requirement from the previous EMR Specification version.
**R** = Retired requirement from the previous EMR Specification version.

OMD #:

A unique identifier that identifies each requirement within OntarioMD's EMR Requirements Repository.

CONFORMANCE LANGUAGE

The following definitions of the conformance verbs are used in this document:

- **SHALL/MUST** – Required/Mandatory
- **SHOULD** – Best Practice/Recommendation
- **MAY** – Acceptable/Permitted

The tables that follow contain column headings named: 1) "Requirement," which generally contains a high-level requirement statement; and 2) "Guidelines," which contains additional instructions or detail about the high-level requirement. The text in both columns is considered requirement statements.

## 2.1 CMS Connectivity

The key value to retrieve the URL to interact with the CMS is retrieved as a parameter within the toolbar parameter. The toolbar parameter resides in the OAuth2 token request return. The following requirements apply to EMR functionality to connect to and interact with CMS.

| OMD # | REQUIREMENT | GUIDELINES | M/O | STATUS |
|---|---|---|---|---|
| CM01.01 | The EMR Offering MUST retrieve the CMS endpoint value from the OAuth2 token request return in order to interact with CMS. | It is not acceptable to hard code the CMS endpoint value in the EMR Offering.<br><br>The CMS key – used to retrieve the CMS endpoint value – is found in the toolbar parameter in the OAuth2 token request return. Refer to "CMS_url" in the Generic Use Case section of the ONE Access Viewlet Framework document for more information on how to identify the appropriate key and how to retrieve the CMS endpoint value.<br><br>**Note**: The toolbar parameter contains additional parameters for other purposes. | M | P |

## 2.2 Context Data Submission

The following EMR requirements apply to EMR Functionality specific for context data submission to the CMS.

| OMD # | REQUIREMENT | GUIDELINES | M/O | STATUS |
|---|---|---|---|---|
| CM02.01 | The EMR Offering MUST submit all required context data to the CMS to set the context for an EHR Service or Viewlet. | The EMR Offering MUST submit the following context data required by an EHR service or Viewlet when setting the context.<br><br><u>Context Data Elements Required</u><br><br>a) Health Information Custodian (HIC) Organization<br><br>b) Location of the HIC (only if it is different from organization address)<br><br>c) Practitioner<br><br>d) Patient | M | P |

| OMD # | REQUIREMENT | GUIDELINES | M/O | STATUS |
|---|---|---|---|---|
| | | Refer to the "Profiles and Transactions section" in the "Ontario Context Management HL7 FHIR Implementation Guide" and the "EMR Integration with Viewlet Framework" document for more details on each context data element.<br><br>**Note:** Elements defined above are set at different times in the workflow. See subsequent requirements for when to set the context for each data element. | | |
| CM02.02 | The EMR Offering MUST submit context data to the CMS when an EMR user authenticates using their Federated Identity credentials. | The EMR Offering MUST submit the following context data when an EMR user logs in:<br>a) Organization<br>b) Location (only if it is different than organization address)<br>c) Practitioner<br><br>Refer to the "FHIRcast Event Catalog" in the "Ontario Context Management HL7 FHIR Implementation Guide" and the "EMR Integration with Viewlet Framework" document for more details on each context data element. | M | P |
| CM02.03 | The EMR Offering MUST only submit the patient context data to the CMS when an EMR user is launching a Context-Aware EHR Service or Viewlet. | The ability for an EMR Offering to submit the patient context MUST be restricted screen or workflow that explicitly references an individual patient.<br><br>The EMR Offering MUST send the patient context data to the CMS only when an EMR user is launching a Context-Aware EHR Service or Viewlet.<br><br>Refer to the "Profiles and Transactions" section in the "Ontario Context Management HL7 FHIR Implementation Guide" for more details on the patient context data element. | M | P |

| OMD # | REQUIREMENT | GUIDELINES | M/O | STATUS |
|---|---|---|---|---|
| | | **Important**: It is not acceptable to launch a Context-Aware EHR Service or Viewlet from any module/screen within an EMR Offering that references more than one specific patient, or where one specific patient cannot be identified. | | |

## 2.3 Context-Aware EHR Service

The following EMR requirements apply to EMR Functionality specific for context-aware EHR Service.

| OMD # | REQUIREMENT | GUIDELINES | M/O | STATUS |
|---|---|---|---|---|
| CM03.01 | The EMR Offering MUST provide context data when interacting with any EHR Service that is Context-Aware. | It is not acceptable for the EMR Offering to not provide context to an EHR Service that is Context-Aware.<br><br>Refer to the "EMR Integration with Viewlet Framework" document for more information on how to provide context data to a Context-Aware EHR Service. | M | P |
| CM03.02 | The EMR Offering MUST extract and use the endpoint values needed to provide context data. | The EMR Offering MUST retrieve the CMS server endpoint.<br><br>The EMR Offering MUST NOT hardcode endpoint values within the EMR Offering.<br><br>Refer to the "hub.url" and "cms_url" in the "EMR Integration with Viewlet Framework" document for more information on how to retrieve endpoint value(s). | M | P |
| CM03.03 | When interacting with CMS, the EMR Offering MUST populate the event "id" parameter with the corresponding ONE Access Gateway (OAG) X-Request-ID value. | Refer to the "FHIRcast Events Catalog" in the "Ontario Context Management HL7 FHIR Implementation Guide" for more details on the event "id". | M | P |

| OMD # | REQUIREMENT | GUIDELINES | M/O | STATUS |
|---|---|---|---|---|
| | | Refer to the "ONE Access Gateway – Transport Specification" and "ONE Access Gateway – Requirements" documents for more details on the X-Request-Id. | | |

## 2.4 Context Sharing Parameters

The following EMR requirements apply to EMR Functionality specific for context sharing parameters to the CMS.

| OMD # | REQUIREMENT | GUIDELINES | M/O | STATUS |
|---|---|---|---|---|
| CM04.01 | The EMR Offering MUST ensure that the CMS unique identifier is populated whenever setting the context. | Refer to the "hub.topic" parameter in the "Login" section in the "EMR Integration with Viewlet Framework" document for more information on the CMS unique identifier. | M | P |
| CM04.02 | The EMR Offering MUST provide scopes within the return access tokens to the CMS. | Refer to the "login" section in the "EMR Integration with Viewlet Framework" document for CMS scopes.<br><br>**Informational**: Scopes define the access privileges an EMR user has to the CMS and are returned to the EMR Offering as part of the access token response from the OAuth2 server. | M | P |

## 2.5 Context Synchronization

All timeouts for the context management service is defined by the OAG. The following EMR requirements apply to EMR Functionality specific for context synchronization to the CMS.

| OMD # | REQUIREMENT | GUIDELINES | M/O | STATUS |
|---|---|---|---|---|
| CM05.01 | The EMR Offering MUST wait for a response after setting the context. | After setting the context, the EMR Offering MUST wait for an acknowledgment to be returned from the One Access Gateway.<br><br>Where no acknowledgment was sent back, the EMR Offering MUST allow the EMR user to re-attempt to set context again. The EMR Offering MUST NOT allow an infinite number of re-attempts.<br><br>Where the finite number of attempts have failed, the EMR Offering MUST notify the EMR user of the failure. If the attempts fail. The EMR Offering MUST not continue.<br><br>**Informational**: If the EMR Offering does not wait for an acknowledgment, it will be unclear whether the context available to the EHR service is current or stale, leading to possibly using context for the wrong data (e.g., patient). | M | P |

## 2.6 Notifications for Context-Aware EHR Service

Launching an EHR Service in context can cause adverse or unintended behaviour when multiple sessions or windows are open or remain open where multiple contexts (e.g., multiple patient contexts) can cause confusion, resulting in a possible patient safety concern. EMR Offering requirements in this section help to reduce or mitigate some of these situations to provide context for a single session in a single window.

| OMD # | REQUIREMENT | GUIDELINES | M/O | STATUS |
|---|---|---|---|---|
| CM06.01 | The EMR Offering MUST notify the EMR user in situations where subsequent Context-Aware EHR Service or Viewlet browser windows may be simultaneously opened. | Having multiple windows open can result in inadvertently referencing unintended patient information. In such scenarios or potential scenarios, the EMR user MUST be informed of this potential risk.<br><br>It is suggested to implement controls to prevent having multiple browser windows open. Where such controls exist that prevent such potential risks, or for scenarios where there is no risk of having multiple EHR Service windows open, then it is not required to inform the EMR user. | M | P |
| CM06.02 | The EMR user MUST have the option to disable and re-enable functionality that notifies an EMR user when multiple browsers may be opened. | Only where an EMR Offering maintains functionality to inform the EMR user when multiple EHR browsers may be opened, there MUST be a configuration to allow an EMR user to disable or re-enable such messages. The initial state MUST be set to enabled and changes to this configuration by the EMR user MUST be logged by the EMR Offering.<br><br>If controls exist within the EMR Offering that prevents having multiple browser windows open, then it is not required to implement such configuration and logging. | M | P |
| CM06.03 | The EMR Offering MUST clear the patient context data in the CMS when an EMR user closes a Context-Aware EHR Service or Viewlet. | When an EMR user closes a Context-Aware EHR Service or Viewlet, The EMR Offering MUST clear the patient context data in the CMS.<br><br>Refer to the “Profiles and Transactions” section in the “Ontario Context Management HL7 FHIR Implementation Guide” for more details on the patient context data. | M | P |

| OMD # | REQUIREMENT | GUIDELINES | M/O | STATUS |
|---|---|---|---|---|
| | | **Important**: Leaving patient context data set in the CMS after an EMR user has closed a Context-Aware EHR Service or Viewlet may lead to an EMR user viewing the wrong patient information when subsequent Context-Aware EHR Services or Viewlets are opened. | | |

## 2.7 Auditing and Logging

EMR systems log various information and interactions and may contain PHI. As a result, consideration should be taken to log only what is necessary to avoid unintentionally saving or providing access to logged PHI and should be regarded with the same sensitivities as data containing PHI. The following EMR requirements apply to functionality specific to logging and auditing for the CMS and are supplementary to the requirements identified in the Primary Care Baseline Specification.

| OMD # | REQUIREMENT | GUIDELINES | M/O | STATUS |
|---|---|---|---|---|
| CM07.01 | The EMR Offering MUST log all interactions while attempting to set the context. | At a minimum, logs MUST include:<br>a) The name of the Context-Aware EHR Service<br>b) The action or command attempted<br>c) The date and time the interaction occurred<br>d) The initiating EMR user<br>e) The CMS unique identifier<br>f) The status (e.g., success or failure)<br>g) Any warning or error messages received from a Context-Aware EHR Service<br>h) Any warning or error messages provided by the EMR Offering<br><br>Logs MUST include both successful and failed interactions. | M | P |

## 2.8 Error Management

In general, any error, warning, or information message provided to an EMR user SHOULD be understandable by the EMR. This MAY be via a message to the EMR user, or via an error code as long as reference material is provided to interpret those codes.

| OMD # | REQUIREMENT | GUIDELINES | M/O | STATUS |
|---|---|---|---|---|
| CM08.01 | The EMR Offering MUST inform the EMR user if mandatory context data is missing. | If an EMR user attempts to launch a Context-Aware EHR Service or Viewlet that has missing context data, the EMR Offering MUST inform the EMR user of:<br>a) The missing required data<br>b) The failure to launch the Context-Aware EHR Service.<br><br>The EMR Offering MUST NOT submit the patient Context where required data is missing. | M | P |
| CM08.02 | The EMR Offering MUST inform the EMR user if-any context submission fails. | If any context data has been validated and submitted, but no success response is received (i.e., a failure response is received back to the EMR Offering or a non-response) within the defined Context Response Wait Time period, the EMR Offering MUST inform the EMR user of the failure.<br><br>There SHOULD be mechanisms within the EMR Offering to re-try such failures, where possible. Actions MAY include (but are not restricted to):<br>a) Automatic retries for a finite number of attempts for a non-response. Where the attempt fails, the EMR Offering MUST NOT continue to connect to the EHR Service.<br>b) Providing a mechanism for the EMR user to manually initiate a retry for a non-response. | M | P |