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TronsHealth

§170.315(g)(9) Application Access – all data request

PREPARED FOR

ONC-ACB
ONC Certification

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1. Overview

The ONC certification criterion §170.315(g)(9) ensures Health IT systems provide APIs that enable users to generate CCDA Documents against a patient's complete clinical and USCDI v3 data. This certification promotes interoperability across healthcare systems, allowing patients, providers, and third-party applications to access and manage health information — including referral summaries, discharge summaries, and more.

TronsHealth supports interoperability using HL7 FHIR Release 4 and the HL7 CCDA 2.1 Implementation Guide and CDA Release 2.0 standards. (FHIR® is the registered trademark of HL7.)

TronsHealth uses standard terminology and codes — including LOINC, SNOMED CT, ICD-9-CM, ICD-10-CM, CPT-4, HCPCS, RxNorm, and NDC — for observations, orders, medications, conditions, allergies, immunizations, and other categories of information.

TronsHealth has implemented CCDA for ONC Certification §170.315(g)(9). The API returns patient clinical data formatted as C-CDA 2.1 Continuity of Care Documents (CCD), conforming to C-CDA Companion Guide Release 4.1 requirements and including all USCDI v3 data classes and elements.

1.1. Introduction

The API provided in compliance with ONC Certification §170.315(g)(9) supports secure, interoperable access to health data through CCDA documents. This documentation covers mandatory software components, configurations, function names, API syntax, parameter definitions with data types, return variable structures, exception handling, and all technical requirements necessary for application registration with TronsHealth's authorization server.

1.2. Mandatory Software Components

1.2.1 Core Software Components

- **EHR System:** The API is integrated with the TronsHealth EHR system, which is ONC certified and HIPAA compliant.
- **CCDA Document Generation:** The Health IT Module supports creation and retrieval of CCDA-compliant documents for patient data exchange, including all USCDI v3 data classes and elements.
- **Authorization Server:** OAuth 2.0-compliant authorization server manages application registration, token issuance, and scope enforcement.
- **FHIR Server:** HL7 FHIR Release 4 server supporting required resource types aligned with US Core IG.

1.2.2. Server Requirements

- **Operating System:** Windows-based server environments.
- **Web Server:** .NET Framework with Microservices architecture for handling API requests and document generation.
- **Database:** Microsoft SQL Server.
- **Runtime:** .NET 6.0 or higher.
- **TLS:** TLS 1.2 or higher required for all connections.

1.3. Configuration Details

1.3.1. API Server Configuration

- **Base URL:** https://api.tronshealth.com
- **Port:** 44335 (HTTPS default).
- **Protocol:** HTTPS only. HTTP connections are rejected.
- **Content-Type:** application/xml (CCDA response), application/json (error responses).

1.3.2. CCDA Document Configuration

- **CCDA Version:** C-CDA 2.1 conforming to C-CDA Companion Guide Release 4.1.
- **Document Types:** Continuity of Care Documents (CCD), Discharge Summaries, Referral Notes, and all 9 Clinical Note Types required by USCDI v3.
- **Standards Version:** USCDI v3 (with v3.1 modifications per EO 14168).

1.3.3. Authentication Configuration

- **Authentication Type:** Token-based authentication using Bearer tokens (OAuth 2.0).
- **Token Endpoint:** https://api.tronshealth.com/oauth/token
- **Session Management:** Tokens expire after a configurable period. Re-authentication is required for continued access.
- **Header Format:** Authorization: Bearer {access_token}

1.3.4. Security Configuration & TLS Enforcement

- **TLS Version:** TLS 1.2 or higher is enforced for ALL API communications. Connections using TLS 1.0 or 1.1 are rejected at the server level.
- **TLS Enforcement Method:** Enforced via IIS binding configuration and .NET HttpsRedirection middleware. The server is configured to disable SSLv2, SSLv3, TLS 1.0, and TLS 1.1 via Windows Registry settings (HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Control\SecurityProviders\SCHANNEL\Protocols).
- **Certificate Management:** Valid SSL/TLS certificates are validated during exchange to ensure secure connections.
- **SMTP:** All CCDA documents are transmitted securely using SMTP with TLS encryption.

1.4. API Terms and Conditions

1.4.1. Licensing and Access

API access is provided under a non-exclusive license to authorized users who comply with the terms outlined in this document. Users are not permitted to reverse-engineer or modify the API for unauthorized purposes.

1.4.2. Data Privacy and Security

The API adheres to HIPAA regulations, ensuring the privacy of patient data through secure exchange of CCDA documents. All communications involving CCDA documents must use TLS encryption to secure transmission of PHI.

1.4.3. Liability

The API provider is not responsible for data loss or security breaches resulting from misuse or failure to comply with these terms. Users are responsible for ensuring their applications remain compliant with all relevant privacy and security regulations.

1.4.4. Termination

The API provider reserves the right to terminate access in case of non-compliance with ONC certification requirements or for security-related reasons.

1.5. Conclusion

The provided API leverages CCDA for the secure exchange of health information, complying with ONC Certification §170.315(g)(9). The system supports secure messaging via SMTP and the Direct protocol, ensuring that all transmitted CCDA documents are protected and standardized.

1.6. Key Requirements

- The API must respond to requests for patient data (using an ID or other token) for all data categories specified in USCDI v3 at one time, in a summary record formatted per C-CDA Release 2.1 CCD template.
- The API must respond to requests for patient data associated with a specific date as well as a specific date range.
- API documentation must include API syntax, function names, required and optional parameters with data types, return variable types/structures, and exception handling methods and returns.
- The CCDA output must conform to C-CDA Companion Guide Release 4.1 and include all USCDI v3 data elements (with v3.1 modifications per EO 14168).

1.7. Importance

Achieving certification under §170.315(g)(9) is crucial for EHR systems to support modern healthcare needs — patient empowerment, care coordination, and data-driven decision-making. This certification fosters innovation by enabling a wide range of applications to connect with EHRs, enhancing patient care and enabling effective population health management.

TronsHealth handles a patient's complete clinical, demographic, appointment, and insurance data in the CCDA document per the HL7 CCDA 2.1 Implementation Guide and CDA Release 2.0 standards.

2. API Function Names & Syntax

The following table defines all API functions exposed by the TronsHealth g9 API module, including the function name, HTTP method, full syntax, and description. See Table 2.

Function Name	HTTP Method	Endpoint / Syntax	Description
GetCCDFiles	GET	[baseUrl]/CCDFiles/GetCCDFiles?patientId={patientId}&practiceId={practiceId}[&fromDate={fromDate}][&toDate={toDate}]	Retrieves a complete CCDA 2.1 CCD document for the specified patient, including all USCDI v3 data classes. Supports optional date filtering.

Table 2: API Functions Names & Syntax

2.1. Full API Syntax

GET [baseUrl]/CCDFiles/GetCCDFiles?patientId=[patientID]&practiceId=[practiceId][&fromDate=[YYYY-MM-DD]][&toDate=[YYYY-MM-DD]]

Parameters enclosed in square brackets [ ] are optional. Parameters without brackets are required. Date parameters follow ISO 8601 format: YYYY-MM-DD.

2.2. Request Headers See Table 2.2

Header	Required	Value / Description
Authorization	Yes	Bearer {access_token} — OAuth 2.0 Bearer token obtained from the token endpoint.
Content-Type	No	Not required for GET requests.
Accept	No	application/xml (default) — specifies expected response format.

Table 2.2: Request Heers

3. Parameters – Required & Optional (with Data Types)

The following table defines all parameters accepted by the GetCCDFiles API function, including names, data types, whether required or optional, valid value ranges, and descriptions. See Table 3

Name	Data Type	Required	Format / Valid Values	Description
patientId	long (int64)	Yes	Positive integer (e.g., 12345)	Unique numeric identifier for the patient. Used to fetch all clinical data from the EHR system.
practiceId	long (int64)	Yes	Positive integer (e.g., 1001)	Identifier for the location or branch of the medical facility where the patient is registered.
fromDate	string (date)	No	YYYY-MM-DD (ISO 8601)	Start date for filtering patient data. Returns records on or after this date. If omitted, all historical data is returned.
toDate	string (date)	No	YYYY-MM-DD (ISO 8601)	End date for filtering patient data. Returns records on or before this date. Must be equal to or later than fromDate if both are provided.

Table 3: Parameters Required & Optional

4. Return Variables and Response Structures

On a successful request (HTTP 200), the API returns a complete ClinicalDocument XML document conforming to the C-CDA 2.1 CCD template. The response Content-Type is application/xml.

4.1. Success Response – Top Level Return Variables See Table 4.1

Return Variable / Element	Type	Required	Description
ClinicalDocument	XML Root Element	Yes	Root element of the CCDA document. Conforms to HL7 CDA Release 2.0 and C-CDA 2.1 template.
realmCode	XML Element (code attr)	Yes	Realm code — always 'US' for US realm documents.
templateId	XML Element (root attr)	Yes	Identifies the C-CDA 2.1 CCD template. Multiple templateId elements present for different conformance levels.
id	XML Element (UUID)	Yes	Globally unique identifier (GUID/UUID) for this document instance.
code	XML Element (LOINC)	Yes	Document type code. 34133-9 (LOINC) = Summarization of Episode Note (CCD).
title	string	Yes	Human-readable title of the document (e.g., patient name and document type).
effectiveTime	dateTime (HL7 TS)	Yes	Date/time the document was generated. Format: YYYYMMDDHHMMSS.

confidentialityCode	XML Element	Yes	Confidentiality level code. Value: 'N' (Normal).
languageCode	XML Element	Yes	Language of the document. Value: 'en-US'.
recordTarget / patientRole	XML Complex Element	Yes	Patient demographic data — name, DOB, gender, race, ethnicity, address, telecom, language.
author	XML Complex Element	Yes	Authoring provider/organization details including NPI, name, and contact.
custodian	XML Complex Element	Yes	Organization responsible for maintaining the document.
documentationOf / serviceEvent	XML Complex Element	Yes	Clinical service event with effectiveTime range and performing provider.
component / structuredBody	XML Complex Element	Yes	Structured body containing all clinical sections.
section – Allergies (48765-2)	XML Section	Yes	Allergies and adverse reactions in SNOMED CT / RxNorm codes.
section – Problems (11450-4)	XML Section	Yes	Problem list with ICD-10-CM codes and status.
section – Medications (10160-0)	XML Section	Yes	Medication history with RxNorm codes, dosage, and route.
section – Vital Signs (8716-3)	XML Section	Yes	Vital sign observations with LOINC codes and UCUM units.
section – Social History (29762-2)	XML Section	Yes	Social history including sex, smoking status, and other observations.
section – Encounters (46240-8)	XML Section	Yes	Encounter history with dates, providers, and diagnoses.
section – Consultation Notes (11488-4)	XML Section	Conditional	Clinical notes authored by providers. Included when available.

Table 4.1: Success Response

4.2. Error Response – Return Structure

On error, the API returns a JSON object (Content-Type: application/json) with the following structure:

{ "statusCode": 400, "error": "Bad Request", "message": "patientId is required and must be a valid positive integer.", "timestamp": "2025-02-01T10:30:00Z"} See Table 4.2

Field	Type	Description
statusCode	integer	HTTP status code of the error.
error	string	Short error category label.
message	string	Human-readable description of the error.
timestamp	ISO 8601 dateTime	UTC timestamp of when the error occurred.

Table 4.2: Error Response

5. Errors, Exceptions and Exception Handling

The following table documents all possible error codes returned by the GetCCDFiles API function, the exception handling method triggered, the structure of the error response, and recommended client-side handling actions. See Table 5

HTTP Code	Response	Exception Handling Method	Response Body / Return	Client Action
200	Success	N/A — request processed successfully.	Complete ClinicalDocument XML (C-CDA 2.1 CCD). Content-Type: application/xml.	Parse and consume XML document.
400	Bad Request	InvalidParameterException — triggered when required parameters are missing or have invalid format/type.	{"statusCode":400,"error":"Bad Request","message":"<detail>","timestamp":"<ISO8601>"}	Inspect message field for specific invalid parameter. Correct and retry.
401	Access Denied	UnauthorizedException — triggered when the Authorization header is absent, malformed, or the token is expired/invalid.	{"statusCode":401,"error":"Unauthorized","message":"Invalid or expired Bearer token.","timestamp":"<ISO8601>"}	Re-authenticate with the token endpoint and obtain a new Bearer token.
403	Forbidden	ForbiddenException — triggered when a valid token does not have the required scope or permission.	{"statusCode":403,"error":"Forbidden","message":"Insufficient scope or access rights.","timestamp":"<ISO8601>"}	Verify the application has been granted correct

				scopes for the requested resource.
404	Not Found	ResourceNotFoundException — triggered when the specified patientId or practiceId does not exist.	{"statusCode":404,"error":"Not Found","message":"Patient or practice resource not found.","timestamp":"<ISO8601>"}	Confirm patientId and practiceId are correct and exist in the system.
500	Internal Server Error	UnhandledException — triggered by unexpected server-side failures. Errors are logged with a correlation ID.	{"statusCode":500,"error":"Internal Server Error","message":"An unexpected error occurred.","correlationId":"<UUID>","timestamp":"<ISO8601>"}	Log the correlationId and contact TronsHealth support if the issue persists.

Table 5: Errors & Exceptions

6. Application Registration Requirements (Authorization Server)

This section documents all technical requirements and attributes necessary for an application to be registered with the TronsHealth Health IT Module's authorization server, as required by ONC §170.315(g)(9) and 45 CFR 170.404(a)(2).

6.1. Authorization Server Endpoints See Table 6.1

Endpoint Type	URL
Authorization Endpoint	https://api.tronshealth.com/oauth/authorize
Token Endpoint	https://api.tronshealth.com/oauth/token
Registration Endpoint	https://api.tronshealth.com/oauth/register
JWKS URI	https://api.tronshealth.com/.well-known/jwks.json

Table 6.1: Authorization Server Endpoints

6.2. Required Registration Attributes

The following attributes must be submitted when registering an application with the TronsHealth authorization server: See Table 6.2

Attribute	Data Type	Required	Description
client_name	string	Yes	Human-readable name of the client application.

redirect_uris	array of strings	Yes	One or more URIs to which the authorization server will redirect after user consent. Must use HTTPS (except localhost for development).
grant_types	array of strings	Yes	OAuth 2.0 grant types supported. Allowed values: authorization_code, refresh_token.
response_types	array of strings	Yes	OAuth 2.0 response types. Allowed values: code.
scope	string (space-sep.)	Yes	Requested access scopes. See Section 6.3 for supported scopes.
token_endpoint_auth_method	string	Yes	Authentication method for the token endpoint. Allowed values: client_secret_basic, private_key_jwt (for native apps).
client_uri	string (URL)	No	URL of the application's homepage or documentation.
logo_uri	string (URL)	No	URL of the application's logo image.
contacts	array of strings	No	Email addresses of contacts responsible for the application.
jwks_uri	string (URL)	Conditional	Required if token_endpoint_auth_method is private_key_jwt. URL of the client's JSON Web Key Set.
software_id	string (UUID)	No	Unique identifier for the software product (assigned by developer).
software_version	string	No	Version of the software product.

Table 6.2: Required Registration Attributes

6.3. Supported Scopes

The following OAuth 2.0 scopes are supported by the TronsHealth authorization server for the g9 CCDA API: See Table 6.3

Scope	Access Granted	Required For g9
patient/ClinicalDocument.read	Read access to the patient's CCDA clinical document.	**Yes**
patient/*.read	Read access to all patient-level resources.	Optional
openid	OpenID Connect identity token (user identity).	Optional
profile	Access to user profile information.	Optional
offline_access	Enables issuance of a refresh token for long-lived access.	Optional

Table 6.3: Supported Scopes

6.4. Refresh Token Issuance for Native Application

TronsHealth supports the secure issuance of initial refresh tokens to native applications using the following methods:

- **PKCE (Proof Key for Code Exchange) — RFC 7636:** Native applications must use the Authorization Code flow with PKCE. The code_challenge_method must be S256. PKCE prevents authorization code interception attacks in native/mobile environments.
- **Offline Access Scope:** Native applications must request the offline_access scope during authorization to receive a refresh token. Refresh tokens are single-use (rotated on each refresh).
- **Refresh Token Expiry:** Refresh tokens expire after 30 days of inactivity or upon explicit revocation by the user or administrator.
- **Token Revocation Endpoint:** https://api.tronshealth.com/oauth/revoke (RFC 7009).

6.5. Registration Process

- Submit a POST request to the Registration Endpoint (https://api.tronshealth.com/oauth/register) with all required attributes in JSON format.
- Upon successful registration, the server returns a client_id and client_secret (if applicable). Store these securely.
- Include the client_id in all authorization and token requests.
- Registration is subject to review and approval by the TronsHealth API operations team for production environments.

7. Supported Standards, Specifications and Reference Hyperlink

The following table lists all standards and implementation specifications supported by the TronsHealth Health IT Module for §170.315(g)(9), including links to the correct and current versions of each specification, as required by ONC. See Table 7

Standard / Specification	Version Supported	Reference URL
United States Core Data for Interoperability (USCDI)	v3 (with v3.1 modifications per EO 14168)	https://www.healthit.gov/isa/united-states-core-data-interoperability-uscdi
HL7 CDA Release 2.0	Release 2.0	https://www.hl7.org/implement/standards/product_brief.cfm?product_id=7
HL7 C-CDA (Consolidated CDA)	C-CDA 2.1	https://www.hl7.org/implement/standards/product_brief.cfm?product_id=492
C-CDA Companion Guide	Release 4.1	https://www.hl7.org/ccdasearch/
HL7 FHIR	Release 4 (R4)	https://hl7.org/fhir/R4/

US Core Implementation Guide	v6.1.0 (USCDI v3 aligned)	https://hl7.org/fhir/us/core/STU6.1/
LOINC	Current (2.77+)	https://loinc.org/
SNOMED CT	Current International Edition	https://www.snomed.org/snomed-ct/
ICD-10-CM	Current Fiscal Year Version	https://www.cdc.gov/nchs/icd/icd-10-cm/
RxNorm	Current Monthly Release	https://www.nlm.nih.gov/research/umls/rxnorm/
OAuth 2.0 (RFC 6749)	RFC 6749	https://datatracker.ietf.org/doc/html/rfc6749
PKCE — RFC 7636	RFC 7636	https://datatracker.ietf.org/doc/html/rfc7636
TLS	1.2 or higher (TLS 1.0/1.1 disabled)	https://datatracker.ietf.org/doc/html/rfc5246
ONC 21st Century Cures Act Final Rule	45 CFR Part 170	https://www.healthit.gov/curesrule/
ONC Certification Companion Guide (CCG) g9	Current	https://www.healthit.gov/test-method/application-access-all-data-request

Table 7: Supported Standards & Specifications

8. CCDA Sample Response

On a successful GET request, the API returns a complete ClinicalDocument XML conforming to the C-CDA 2.1 CCD template. The response Content-Type is application/xml.

8.1. Request Example

On a successful GET request, the API returns a complete ClinicalDocument XML conforming to the C-CDA 2.1 CCD template. The response Content-Type is application/xml. See Table 8.1

8.2. Response Structure Summary

Method	Endpoint	Interaction	Parameter	Type	Required
GET	[baseUrl]/CCDFiles/GetCCDFiles?patientId=[ID]&practiceId=[ID]	read	patientId practiceI	long long	Yes Yes

			d fromDat e toDate	string(da te) string (date)	No No

Table 8.1: Response

8.3. Response

The response is a complete ClinicalDocument XML conforming to C-CDA 2.1 CCD template. Below is the updated sample response structure including all USCDI v3 required sections:

<ClinicalDocument xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xmlns:xsd="http://www.w3.org/2001/XMLSchema" xmlns:voc="urn:hl7-org:v3/voc" xmlns:sdtc="urn:hl7-org:sdtc" xmlns="urn:hl7-org:v3">
<realmCode code="US"/>
<typeId root="2.16.840.1.113883.1.3" extension="POCD_HD000040"/>
<templateId root="2.16.840.1.113883.10.20.22.1.1" extension="2015-08-01"/>
<templateId root="2.16.840.1.113883.10.20.22.1.1"/>
<templateId root="2.16.840.1.113883.10.20.22.1.2" extension="2015-08-01"/>
<templateId root="2.16.840.1.113883.10.20.22.1.2"/>
<id root="2.16.840.1.113883.3.669.1.668693" extension="b7804b1f-8291-44d7-bc2f-b2c6d5509cdf"/>
<code code="34133-9" displayName="Summarization of Episode Note" codeSystem="2.16.840.1.113883.6.1" codeSystemName="LOINC"/>
<title>Martin,Blue Export Summary</title>
<effectiveTime value="20240930133519"/>
<confidentialityCode code="N" codeSystem="2.16.840.1.113883.5.25" codeSystemName="Confidentiality"/>
<languageCode code="en-US"/>
<recordTarget>
<patientRole>
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<country>US</country>
</addr>
<telecom value="tel:+1" use="MC"/>
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<name use="L">
<prefix qualifier="AC">Mr.</prefix>
<given>Martin</given>
<family>Blue</family>
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<originalText>AdministrativeGender codes are: M (Male), F (Female) or UN (Undifferentiated).</originalText>
</administrativeGenderCode>
<birthTime value="20130711"/>
<maritalStatusCode codeSystemName="MaritalStatusCode" codeSystem="2.16.840.1.113883.5.2"/>
<raceCode code="2106-3" displayName="White" codeSystemName="CDCREC" codeSystem="2.16.840.1.113883.6.238" codeSystemVersion="1.2"/>
<sdtc:raceCode code="2108-9" displayName="White European" codeSystemName="CDCREC" codeSystem="2.16.840.1.113883.6.238"/>
<ethnicGroupCode code="2135-2" displayName="Hispanic or Latino" codeSystemName="CDCREC" codeSystem="2.16.840.1.113883.6.238" codeSystemVersion="1.2"/>
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<languageCode code="en"/>
</languageCommunication>
</patient>
<providerOrganization>
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<postalCode>85251</postalCode>
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</recordTarget>
<author>
<time value="20200622"/>
<assignedAuthor>
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codeSystem="2.16.840.1.113883.6.101" codeSystemName="Healthcare Provider Taxonomy
(HIPAA)"/>
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<act classCode="ACT" moodCode="EVN">
<templateId root="2.16.840.1.113883.10.20.22.4.30"/>
<templateId root="2.16.840.1.113883.10.20.22.4.30" extension="2015-08-01"/>
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