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# **TronsHealth**

**§170.315(g)(7) Application Access - Patient Selection &**

**§170.315(g)(10) Standardized API for patient and population services**

PREPARED FOR

**ONC-ACB**

ONC Certification

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## 1. Overview

This document is the combined developer-facing API documentation for TronsHealth's ONC-certified Health IT Module, covering two certification criteria:

- **§170.315(g)(7) — Application Access: Patient Selection:** Enables individual patient-level FHIR R4 data access via SMART App Launch v2.0.0.
- **§170.315(g)(10) — Standardized API for Patient and Population Services:** Enables both individual and population-level FHIR R4 data access, including bulk export.

This document includes all information required by §170.315(g)(7)(viii), §170.315(g)(10)(viii), and API Transparency Conditions at 45 CFR 170.404(a)(2): API syntax, function names, parameters with data types, return variable structures, exception handling, mandatory software components and configurations, authorization server registration requirements, supported US Core IG choices, supported scopes, TLS enforcement method, refresh token issuance methods, additional data disclosures, and API Terms and Conditions.

FHIR is the registered trademark of HL7. TronsHealth supports HL7 FHIR Release 4 with US Core IG v6.1.0 profiles aligned with USCDI v3.

### 1.1. Supported Standards

Standard / Specification	Version	Reference URL
USCDI	v3 (w/ EO 14168 v3.1 modifications)	<a href="https://www.healthit.gov/isa/united-states-core-data-interoperability-uscdi">https://www.healthit.gov/isa/united-states-core-data-interoperability-uscdi</a>
HL7 FHIR	Release 4 (R4 — 4.0.1)	<a href="https://hl7.org/fhir/R4/">https://hl7.org/fhir/R4/</a>
US Core Implementation Guide	v6.1.0 (USCDI v3 aligned)	<a href="https://hl7.org/fhir/us/core/STU6.1/">https://hl7.org/fhir/us/core/STU6.1/</a>
SMART App Launch Framework	v2.0.0	<a href="https://hl7.org/fhir/smart-app-launch/2.0.0/">https://hl7.org/fhir/smart-app-launch/2.0.0/</a>
FHIR Bulk Data Access IG	v2.0.0	<a href="https://hl7.org/fhir/uv/bulkdata/STU2/">https://hl7.org/fhir/uv/bulkdata/STU2/</a>
OAuth 2.0	RFC 6749	<a href="https://datatracker.ietf.org/doc/html/rfc6749">https://datatracker.ietf.org/doc/html/rfc6749</a>
PKCE	RFC 7636	<a href="https://datatracker.ietf.org/doc/html/rfc7636">https://datatracker.ietf.org/doc/html/rfc7636</a>
TLS	1.2 (RFC 5246) / 1.3 (RFC 8446)	<a href="https://datatracker.ietf.org/doc/html/rfc8446">https://datatracker.ietf.org/doc/html/rfc8446</a>
LOINC	Current (2.77+)	<a href="https://loinc.org/">https://loinc.org/</a>



SNOMED CT	Current International Edition	<a href="https://www.snomed.org/snomed-ct/">https://www.snomed.org/snomed-ct/</a>
ICD-10-CM	Current FY Version	<a href="https://www.cdc.gov/nchs/icd/icd-10-cm/">https://www.cdc.gov/nchs/icd/icd-10-cm/</a>
RxNorm	Current Monthly Release	<a href="https://www.nlm.nih.gov/research/umls/rxnorm/">https://www.nlm.nih.gov/research/umls/rxnorm/</a>
CVX	Current	<a href="https://www2.cdc.gov/vaccines/iis/iisstandards/vaccines.asp?rpt=cvx">https://www2.cdc.gov/vaccines/iis/iisstandards/vaccines.asp?rpt=cvx</a>
CPT-4	Current Year	<a href="https://www.ama-assn.org/practice-management/cpt">https://www.ama-assn.org/practice-management/cpt</a>
ONC Cures Act Final Rule	45 CFR Part 170	<a href="https://www.healthit.gov/curesrule/">https://www.healthit.gov/curesrule/</a>
Information Blocking Rule	45 CFR Part 171	<a href="https://www.healthit.gov/topic/information-blocking">https://www.healthit.gov/topic/information-blocking</a>
API Transparency Conditions	45 CFR 170.404	<a href="https://ecfr.gov/current/title-45/subtitle-A/subchapter-D/part-170/subpart-D/section-170.404">https://ecfr.gov/current/title-45/subtitle-A/subchapter-D/part-170/subpart-D/section-170.404</a>

## 1.2. Key Requirements

- Both g7 and g10 APIs must return FHIR R4 resources conforming to US Core IG v6.1.0 profiles (USCDI v3 aligned).
- Authorization uses OAuth 2.0 Authorization Code Flow with PKCE (SMART App Launch v2.0.0).
- API documentation must include: syntax, function names, parameters with data types, return structures, exception handling, mandatory components, configurations, and registration requirements.
- Supported US Core IG choices and references must be documented.
- Supported OAuth 2.0 / SMART scopes must be documented.
- TLS 1.2 enforcement method must be explicitly documented.
- Refresh token issuance method for native applications must be published.
- Additional data beyond USCDI v3 must be disclosed.
- API Terms and Conditions required per 45 CFR 170.404(a)(2).



## 2. API Terms & Conditions

These API Terms and Conditions govern the use of the TronsHealth Health IT Module APIs in compliance with 45 CFR 170.404(a)(2) and ONC Certification requirements. All developers, third-party applications, and authorized users must adhere to these terms. These terms apply to both the §170.315(g)(7) and §170.315(g)(10) APIs.

### 2.1. License and Usage

TronsHealth grants a limited, non-exclusive, non-transferable license to access and use the API solely for developing interoperable healthcare applications. The API must not be used for unauthorized data mining, surveillance, or in any way that violates patient privacy rights under HIPAA. Reverse engineering or disassembly of the API is prohibited.

### 2.2. Data Security & Privacy

All applications accessing the API must comply with HIPAA Privacy and Security Rules and the ONC Cures Act Final Rule (45 CFR Part 170). PHI transmitted via the API must be encrypted using TLS 1.2 or higher. Developers are responsible for maintaining appropriate security controls within their applications.

### 2.3. API Access & Authorization

Access requires OAuth 2.0 authorization with PKCE (RFC 7636) for public and native clients. Applications must be registered before making API calls. Bearer tokens must be included in all requests. Token sharing between applications is prohibited.

### 2.4. Client Registration & Authorization

Client applications must complete the registration process described in the Client Registration section. TronsHealth reserves the right to revoke API access for applications that violate these terms, exhibit security vulnerabilities, or fail to comply with applicable regulatory requirements.

### 2.5. Scopes of API Service

API services are limited to the scopes granted during authorization (principle of least privilege). TronsHealth may perform scheduled maintenance and will provide advance notice where feasible.

### 2.6. Usage-Based & Value-Added Fees

Basic API access for ONC-certified interoperability purposes is provided at no charge, consistent with the Information Blocking Rule under 45 CFR 171. TronsHealth may charge fees for value-added services applied in a non-discriminatory manner per 45 CFR 170.404.

### 2.7. Compliance with ONC Certification Requirements

All API usage must comply with ONC 21st Century Cures Act Final Rule requirements. Developers must not use the API in ways that constitute information blocking as defined under 45 CFR Part 171.

### 2.8. Liability & Indemnity

TronsHealth shall not be liable for data loss, security breaches, or service interruptions resulting from third-party application actions or API misuse. Developers agree to indemnify and hold TronsHealth harmless from any claims arising from their use of the API.

### 2.9. Amendments to Terms & Conditions

TronsHealth reserves the right to update these terms to reflect changes in ONC regulations or security requirements. Continued use of the API after notification constitutes acceptance of updated terms.



### 3. Client Registration

Before calling any API endpoint (g7 or g10), a client application must be registered with the TronsHealth authorization server. Registration grants a client\_id and, for confidential clients, a client\_secret used in all OAuth 2.0 flows.

#### 3.1. Authorization Server Endpoints

See Table 3.1

Endpoint	URL
Authorization	<a href="https://api.tronshealth.com/oauth/authorize">https://api.tronshealth.com/oauth/authorize</a>
Token	<a href="https://api.tronshealth.com/oauth/token">https://api.tronshealth.com/oauth/token</a>
Registration	<a href="https://api.tronshealth.com/oauth/register">https://api.tronshealth.com/oauth/register</a>
JWKS URI	<a href="https://api.tronshealth.com/.well-known/jwks.json">https://api.tronshealth.com/.well-known/jwks.json</a>
SMART Configuration	<a href="https://api.tronshealth.com/.well-known/smart-configuration">https://api.tronshealth.com/.well-known/smart-configuration</a>
Revocation	<a href="https://api.tronshealth.com/oauth/revoke">https://api.tronshealth.com/oauth/revoke</a>
Bulk Data Export	<a href="https://api.tronshealth.com/fhir/r4/\$export">https://api.tronshealth.com/fhir/r4/\$export</a>
CapabilityStatement	<a href="https://api.tronshealth.com/fhir/r4/metadata">https://api.tronshealth.com/fhir/r4/metadata</a>
Introspection	<a href="https://api.tronshealth.com/oauth/introspect">https://api.tronshealth.com/oauth/introspect</a>
FHIR Base URL	<a href="https://api.tronshealth.com/fhir/r4">https://api.tronshealth.com/fhir/r4</a>

Table 3.1: Authorization Server Endpoints

#### 3.2. Registration Attributes with Data Types

See Table 3.2

Attribute	Data Type	Required	Description
client_name	string	Yes	Human-readable name of the client application.
client_type	string	Yes	public (native/SPA) or confidential (server-side).
redirect_uris	array<string>	Yes	Authorized redirect URIs. HTTPS required (or custom scheme for native apps).
grant_types	array<string>	Yes	Required: authorization_code. Add refresh_token if needed.
response_types	array<string>	Yes	Must include: code.
scope	string	Yes	Space-separated list of requested scopes.
token_endpoint_auth_method	string	Yes	client_secret_basic (confidential) or none (public/native with PKCE).
client_uri	string (URL)	No	Application homepage URL.
logo_uri	string (URL)	No	Application logo URL.
contacts	array<string>	No	Developer/support email addresses.



jwt_uri	string (URL)	Cond	Required if using private_key_jwt. URL of client JWKS.
software_id	string (UUID)	No	Unique identifier for the software product.
software_version	string	No	Software version string.

Table: 3.2 Registration Attributes

### 3.3. US Core IG Choices & References Supported

TronsHealth documents the following US Core IG choices and references supported by the Health IT Module, as required by the g10 CCG at §170.315(g)(10)(viii): See Table 3.3

US Core IG Choice / Reference	Decision	Implementation Detail
MustSupport Interpretation	Implemented	All mustSupport elements populated where data is available. data-absent-reason extension used when data is absent.
Medication Representation	CodeableConcept	Medications as medicationCodeableConcept (RxNorm) per US Core choice (no separate Medication resource needed).
Server CapabilityStatement	Full Support	Complete CapabilityStatement at /metadata declares all supported resources, operations, and search parameters.
Narrative Support	Generated	Resource text narratives included with status=generated for all returned resources.
USCDI v3 Data Classes	All Supported	All 25 USCDI v3 data classes and elements supported across appropriate FHIR resource types.
Provenance	Supported	US Core Provenance profile. Provenance resources linked to target resources via target reference.
Clinical Notes (9 Types)	Both Profiles	US Core DiagnosticReport for Note Exchange and US Core DocumentReference both supported for clinical notes.
SMART Launch Contexts	Both	EHR-launch (with context) and standalone-launch both supported.
Bulk Data Export (\$export)	Supported	System-level (\$export), Group-level (/Group/{id}/\$export), and Patient-level (/Patient/\$export). Output: NDJSON.

Table 3.3 API Functions Names & Syntax

## 4. Authorization Flow

TronsHealth APIs use OAuth 2.0 Authorization Code Flow with PKCE (RFC 7636) as required by SMART App Launch Framework v2.0.0. The g10 API additionally supports SMART Backend Services Authorization for bulk/system access.

### 4.1. Patient Facing App Authorization (g7 and g10 –SMART APP Launch with PKCE)

- Step 1 — Generate PKCE: code\_verifier = random(43-128 chars); code\_challenge = BASE64URL(SHA256(code\_verifier))



- Step 2 — Authorization Request:  
GET <https://api.tronshealth.com/oauth/authorize>  
?response\_type=code  
&client\_id={client\_id}  
&redirect\_uri={redirect\_uri}  
&scope=launch/patient openid patient/\*.read offline\_access  
&state={random\_state}  
&aud=https://api.tronshealth.com/fhir/r4  
&code\_challenge={code\_challenge}  
&code\_challenge\_method=S256
- Step 3 — Token Exchange (POST after user consent):  
POST <https://api.tronshealth.com/oauth/token>  
grant\_type=authorization\_code  
&code={authorization\_code}  
&redirect\_uri={redirect\_uri}  
&client\_id={client\_id}  
&code\_verifier={code\_verifier}
- Step 4 — Token Response:  
{ "access\_token": "eyJ...", "token\_type": "Bearer", "expires\_in": 3600,  
"patient": "71299", "scope": "patient/\*.read ...", "refresh\_token": "..." }
- Step 5 — API Call:  
GET <https://api.tronshealth.com/fhir/r4/Patient/71299>  
Authorization: Bearer eyJ...  
Accept: application/fhir+json

#### 4.2. Backend Service Authorization (g10 Bulk Data /System Access)

Used for system-level access (bulk data export). No user interaction required. Uses JWT client assertion signed with registered private key.

```
POST https://api.tronshealth.com/oauth/token  
grant_type=urn:ietf:params:oauth:grant-type:jwt-bearer  
&client_assertion_type=urn:ietf:params:oauth:client-assertion-type:jwt-bearer  
&client_assertion={signed_JWT}  
&scope=system/*.read
```

#### 4.3. Token Refresh

```
POST https://api.tronshealth.com/oauth/token  
grant_type=refresh_token  
&refresh_token={refresh_token}  
&client_id={client_id}
```

#### 4.4. Secure Refresh Token Issuance for Native Applications

TronsHealth supports secure issuance of initial refresh tokens to native and mobile applications using the following methods per RFC 6749, RFC 7636, and SMART App Launch v2.0.0:



- **PKCE — RFC 7636 (S256):** Native apps must use Authorization Code Flow with PKCE. code\_challenge\_method must be S256. Plain is rejected.
- **offline\_access Scope:** App must request offline\_access. Refresh token is only issued when this scope is granted.
- **Token Rotation:** Refresh tokens are single-use. Each use issues a new refresh token and invalidates the previous one.
- **Expiry:** Refresh tokens expire after 30 days of inactivity or upon explicit revocation.
- **Revocation Endpoint:** POST <https://api.tronshealth.com/oauth/revoke>

**Native App Registration:** Must set token\_endpoint\_auth\_method=none and use a custom URI scheme (myapp://callback) or localhost redirect\_uri.

**TLS Version 1.2 Enforcement Method**

TronsHealth enforces TLS 1.2 or higher on all API endpoints via the following layered mechanisms:

- **IIS Binding Configuration:** All HTTPS bindings require TLS 1.2+. TLS 1.0/1.1 bindings are disabled.
- **.NET Middleware:** app.UseHttpsRedirection() and app.UseHsts() enforce HTTPS-only communication.
- **Windows SCHANNEL Registry — Legacy Protocol Disablement:**  
 HKLM\SYSTEM\CurrentControlSet\Control\SecurityProviders\SCHANNEL\Protocols\TLS 1.0\Server: Enabled=0  
 HKLM\SYSTEM\CurrentControlSet\Control\SecurityProviders\SCHANNEL\Protocols\TLS 1.1\Server: Enabled=0  
 HKLM\SYSTEM\CurrentControlSet\Control\SecurityProviders\SCHANNEL\Protocols\SSL 2.0\Server: Enabled=0  
 HKLM\SYSTEM\CurrentControlSet\Control\SecurityProviders\SCHANNEL\Protocols\SSL 3.0\Server: Enabled=0
- **Cipher Suites:** Only ECDHE-based cipher suites with forward secrecy are allowed. RC4, DES, and 3DES are disabled.
- **Certificate:** Valid X.509 certificate from a trusted CA. Certificate expiry is proactively monitored.

**PART A — §170.315(g)(7) — Application Access: Patient Selection**

§170.315(g)(7) enables individual patient data access via FHIR R4. A patient or authorized application requests data for a specific patient using OAuth 2.0 / SMART App Launch v2.0.0 authorization.

**5. Supported Scopes**

The following OAuth 2.0 / SMART on FHIR scopes are supported for the g7 patient-facing API:

Scope	Required	Access Granted
patient/Patient.read	Yes	Read individual patient demographic resource.
patient/AllergyIntolerance.read	Yes	Read patient allergy and intolerance records.
patient/Condition.read	Yes	Read patient conditions and problem list.
patient/MedicationRequest.read	Yes	Read patient medication requests.



patient/Observation.read	Yes	Read patient observations (vitals, labs, SDOH).
patient/Immunization.read	Yes	Read patient immunization records.
patient/Procedure.read	Yes	Read patient procedures.
patient/CarePlan.read	No	Read patient care plans.
patient/Goal.read	No	Read patient health goals.
patient/DiagnosticReport.read	No	Read diagnostic reports and lab results.
patient/DocumentReference.read	No	Read clinical documents and notes.
patient/Encounter.read	No	Read encounter/visit history.
patient/*.read	No	Read access to all patient-level resources.
openid	No	OpenID Connect identity token.
profile	No	User profile claims.
offline_access	No	Enables refresh token for long-lived access.
launch/patient	No	Patient context in EHR-embedded launch.

## 6. 170.315(g)(7) - API Syntax, Function Names & Parameters

The g7 API is a RESTful FHIR R4 API. Base URL: <https://api.tronshealth.com/fhir/r4>

All requests require: Authorization: Bearer {token} | Accept: application/fhir+json

### 6.1. Function Names & Syntax

Function Name	Method	Endpoint / Syntax	Description
ReadPatient	GET	/Patient/{id}	Read one patient by logical ID.
SearchPatient	GET	/Patient?identifier={sys}{{val}}	Search patients by identifier.
ReadObservation	GET	/Observation/{id}	Read one observation.
SearchObservation	GET	/Observation?patient={id}&category={cat}	Search observations by patient and category.
ReadCondition	GET	/Condition/{id}	Read one condition.
SearchCondition	GET	/Condition?patient={id}&category={cat}	Search conditions by patient.
ReadMedicationRequest	GET	/MedicationRequest/{id}	Read one medication request.
SearchMedicationRequest	GET	/MedicationRequest?patient={id}	Search medication requests by patient.
ReadAllergy	GET	/AllergyIntolerance/{id}	Read one allergy/intolerance.



SearchAllergy	GET	/AllergyIntolerance?patient={id}	Search allergies by patient.
ReadImmunization	GET	/Immunization/{id}	Read one immunization.
SearchImmunization	GET	/Immunization?patient={id}&status={s}	Search immunizations by patient.
ReadProcedure	GET	/Procedure/{id}	Read one procedure.
SearchProcedure	GET	/Procedure?patient={id}&date={date}	Search procedures by patient and date.
ReadEncounter	GET	/Encounter/{id}	Read one encounter.
SearchEncounter	GET	/Encounter?patient={id}&date={date}	Search encounters by patient and date.
PatientEverything	GET	/Patient/{id}\$everything	All resources for one patient (FHIR \$everything).
CapabilityStatement	GET	/metadata	Server capability statement.

## 6.2. Common Parameters with Data Types

Parameter	Data Type	Required	Format	Description
{id}	string	Yes*	FHIR logical ID	Resource logical ID. *Required for Read; omit for Search.
patient	string	Yes*	FHIR Patient ID	Patient filter for all patient-level searches.
identifier	string	No	system value	Business identifier. E.g., urn:oid:2.16.840.1 71299.
category	string	No	LOINC/SNOMED code	Category filter. E.g., vital-signs, laboratory.
code	string	No	system code	Specific clinical code filter.
date	string (date)	No	YYYY-MM-DD	Date filter. Supports prefixes: gt, lt, ge, le, eq.
status	string	No	Resource enum	Resource status filter.
_count	integer	No	1–200 (default 20)	Results per page in search Bundle.
_sort	string	No	field / -field	Sort field. Prefix - for descending.
_include	string	No	Resource:field	Include referenced resources in Bundle.



## 7. 170.315(g)(7) - Return Variables, Exception & Error Handling

### 7.1. Single Resource Response (Read)

Return Variable	Type	Description
resourceType	string	FHIR resource type (e.g., Patient, Observation).
id	string	Logical server-assigned resource ID.
meta.versionId	string	Resource version for optimistic concurrency.
meta.lastUpdated	dateTime	ISO 8601 timestamp of last update.
meta.profile	array<uri>	US Core IG profile URL(s) this resource conforms to.
text.status	string	Narrative status: generated   additional.
text.div	xhtml	Human-readable HTML narrative.
[mustSupport]	varies	All mustSupport fields per US Core IG v6.1.0 profile.

### 7.2. Search Bundle Response

Return Variable	Type	Description
resourceType	string	'Bundle'
type	string	'searchset' for search; 'collection' for \$everything.
total	integer	Total number of matching resources.
link	array	Pagination links: self, first, next, previous, last.
entry[].fullUrl	string	Absolute URL identifying the resource.
entry[].resource	object	Full FHIR resource object.
entry[].search.mode	string	match   include   outcome.

### 7.4. Exception Handling – Methods & Returns

HT TP	Status	Exception Class	Response Body	Client Action
200	OK	N/A	Valid FHIR resource, Bundle, or OperationOutcome.	Parse and consume the FHIR response.
400	Bad Request	InvalidRequestException	{"issue":[{"severity":"error","code":"invalid"}]}	Fix parameter format or data types.



401	Unauthorized	UnauthorizedException	{"issue":{"severity":"error","code":"security"}}	Re-authenticate and obtain a new Bearer token.
403	Forbidden	ForbiddenException	{"issue":{"severity":"error","code":"forbidden"}}	Verify scope includes required resource access.
404	Not Found	ResourceNotFoundException	{"issue":{"severity":"error","code":"not-found"}}	Verify resource type and ID.
422	Unprocessable Entity	ValidationException	{"issue":{"severity":"error","code":"business-rule"}}	Review FHIR validation errors in issue details.
429	Too Many Requests	RateLimitException	{"issue":{"severity":"error","code":"throttled"}}	Retry after Retry-After header duration.
500	Internal Server Error	UnhandledException	{"issue":{"severity":"fatal","code":"exception","diagnostics":{"correlationId:..."}}}	Log correlationId and contact support.



## PART B — §170.315(g)(10) — Standardized API for Patient and Population Services

§170.315(g)(10) enables both individual and population-level FHIR R4 data access including bulk data export (\$export), supporting EHR-launch and standalone-launch patterns.

### 8. 170.315 (g)(10) - Supported Scopes

The following scopes are supported for the g10 standardized API. Applications must only request scopes necessary for their function (principle of least privilege).

Scope	Required	Access Granted
patient/Patient.read	Yes	Individual patient demographic data.
patient/AllergyIntolerance.read	Yes	Individual patient allergy records.
patient/CarePlan.read	Yes	Individual patient care plan.
patient/CareTeam.read	Yes	Individual patient care team members.
patient/Condition.read	Yes	Individual patient conditions and problem list.
patient/Device.read	Yes	Individual patient implantable device records.
patient/DiagnosticReport.read	Yes	Individual patient diagnostic reports.
patient/DocumentReference.read	Yes	Individual patient clinical documents and notes.
patient/Encounter.read	Yes	Individual patient encounter history.
patient/Goal.read	Yes	Individual patient health goals.
patient/Immunization.read	Yes	Individual patient immunization records.
patient/MedicationRequest.read	Yes	Individual patient medication requests.
patient/Observation.read	Yes	Individual patient observations.
patient/Procedure.read	Yes	Individual patient procedures.
patient/Provenance.read	Yes	Provenance records for data integrity.
patient/*.read	No	All patient-level resources (broad scope).
user/*.read	No	Provider-level access to all resources.
system/*.read	No	Backend system access for bulk data export.
openid	No	OpenID Connect identity token.
profile	No	User profile claims.
offline_access	No	Enables refresh token issuance.
launch	No	EHR launch context.
launch/patient	No	Patient context in EHR launch.
launch/encounter	No	Encounter context in EHR launch.



## 9. 170.315 (g)(10) -API Syntax , Function Names & Parameters

Base URL: <https://api.tronshealth.com/fhir/r4> | Bulk: [https://api.tronshealth.com/fhir/r4/\\$export](https://api.tronshealth.com/fhir/r4/$export)

### 9.1. Function Names & Syntax

Function Name	Method	Endpoint / Syntax	Description
ReadResource	GET	/ResourceType/{id}	Read one resource by logical ID.
SearchResource	GET	/ResourceType?{searchParams}	Search resources with FHIR search parameters.
CapabilityStatement	GET	/metadata	FHIR server capability statement.
SMARTConfig	GET	/.well-known/smart-configuration	SMART authorization server configuration.
PatientEverything	GET	/Patient/{id}/\$everything	All resources for one patient.
SystemExport	GET	/\$export	Bulk export — all patients (system scope).
GroupExport	GET	/Group/{id}/\$export	Bulk export — specific patient group.
PatientExport	GET	/Patient/\$export	Bulk export — all accessible patients.
BulkStatus	GET	/{export-status-url}	Check status of async bulk export job.
BulkDelete	DELETE	/{export-status-url}	Cancel an in-progress bulk export.

### 9.2. Parameters with Data Types

Parameter	Data Type	Required	Format	Description
{id}	string	Yes*	FHIR logical ID	Resource ID. *Required for Read; omit for Search.
patient	string	Yes*	FHIR Patient ID	Patient filter for patient-level searches.
category	string	No	system code	Category code filter.
code	string	No	system code	Clinical code filter.
date	string (date)	No	YYYY-MM-DD	Date filter with prefix support.
status	string	No	Resource enum	Status filter.
_count	integer	No	1–200 (default 20)	Page size.
_sort	string	No	field / -field	Sort field.



_since	string (dateTime)	No	ISO 8601	Return resources updated after this timestamp.
_type	string	No	ResourceType list	For \$export: comma-separated resource type list.
_include	string	No	Resource:field	Include referenced resources in Bundle.
_reinclude	string	No	Resource:field	Include resources that reference matched ones.

## 10. 170.315 (g)(10) - Return Variables, Errors & Exception Handling

### 10.1. Bulk Data Export (\$export) - Return Structure

Bulk export is asynchronous (HTTP 202 kick-off → status polling → HTTP 200 completion manifest):

HTTP 200 Completion Manifest:

```
{ "transactionTime": "2025-01-01T00:00:00Z",
  "request": "https://api.tronshealth.com/fhir/r4/$export",
  "requiresAccessToken": true,
  "output": [{ "type": "Patient", "url": "https://.../Patient.ndjson", "count": 500 }],
  "error": [] }
```

### 10.2. Exception Handling - Methods & Returns

HT TP	Status	Exception Class	Response Body	Client Action
200	OK	N/A	Valid FHIR resource, Bundle, or OperationOutcome.	Parse and consume the FHIR response.
400	Bad Request	InvalidRequestException	{"issue":{"severity":"error","code":"invalid"}}	Fix parameter format or data types.
401	Unauthorized	UnauthorizedException	{"issue":{"severity":"error","code":"security"}}	Re-authenticate and obtain a new Bearer token.
403	Forbidden	ForbiddenException	{"issue":{"severity":"error","code":"forbidden"}}	Verify scope includes required resource access.



404	Not Found	ResourceNotFoundException	{"issue":{"severity":"error","code":"not-found"}}	Verify resource type and ID.
422	Unprocessable Entity	ValidationException	{"issue":{"severity":"error","code":"business-rule"}}	Review FHIR validation errors in issue details.
429	Too Many Requests	RateLimitException	{"issue":{"severity":"error","code":"throttled"}}	Retry after Retry-After header duration.
500	Internal Server Error	UnhandledException	{"issue":{"severity":"fatal","code":"exception","diagnostics":{"correlationId:..."}}}	Log correlationId and contact support.
202	Accepted	N/A	Bulk export accepted. Check Content-Location header.	Poll status URL until HTTP 200 received.
410	Gone	ResourceDeletedException	{"issue":{"severity":"error","code":"deleted"}}	Resource deleted. Do not retry with same ID.
501	Not Implemented	NotImplementedException	{"issue":{"severity":"error","code":"not-supported"}}	Operation not supported. Check CapabilityStatement.

## 11. Mandatory Software Components & Configuration

### 11.1. Mandatory Software Components

Component	Description / Specification
FHIR R4 Server	HL7 FHIR Release 4 (4.0.1). Implements all US Core IG v6.1.0 profiles. Supports read, search, \$everything, \$export.
OAuth 2.0 / SMART Auth Server	Issues access/refresh tokens. SMART App Launch v2.0.0 + PKCE + Backend Services + EHR-launch context.
Bulk Data Export Service	FHIR Bulk Data Access IG v2.0.0. System, group, and patient-level exports. Output: NDJSON.
EHR Data Integration Layer	Translates TronsHealth EHR data into FHIR R4 resources across all USCDI v3 data classes.
FHIR Terminology Server	Validates/translates LOINC, SNOMED CT, ICD-10-CM, RxNorm, CVX, CPT-4, NPI codes.



TLS Termination (IIS)	Enforces TLS 1.2+ on all connections. Legacy protocols disabled via SCHANNEL registry.
Audit Logging Service	HIPAA-compliant audit logging of all API access events (user, resource, operation, timestamp).
Rate Limiting Service	Per-client rate limits. Returns HTTP 429 + Retry-After header when exceeded.
Microsoft SQL Server	Primary data store for EHR clinical data, FHIR resources, and OAuth client registry.
.NET Runtime 6.0+	Application runtime for all API services.

## 11.2. Mandatory Software Configurations

Configuration	Value / Specification
FHIR Base URL	<a href="https://api.tronshealth.com/fhir/r4">https://api.tronshealth.com/fhir/r4</a>
FHIR Version	4.0.1
HTTPS Port	443. HTTP (80) redirected to HTTPS with 301 + HSTS.
TLS Version	1.2 minimum. TLS 1.3 preferred. Older versions rejected.
US Core IG Version	v6.1.0 (USCDI v3 + EO 14168 v3.1 modifications)
SMART App Launch Version	v2.0.0
Bulk Data IG Version	v2.0.0
Access Token Expiry	3600 seconds (1 hour)
Refresh Token Expiry	30 days inactivity. Single-use with rotation enforced.
CORS	Enabled for registered client origins. OPTIONS preflight supported.
Pagination Default	_count=20. Maximum _count=200 per request.
Response Format	application/fhir+json (primary); application/fhir+xml (supported).
NDJSON Output (Bulk)	One FHIR resource per line. UTF-8 encoding.
Bulk File Availability	24 hours after export completion.
CapabilityStatement URI	<a href="https://api.tronshealth.com/fhir/r4/metadata">https://api.tronshealth.com/fhir/r4/metadata</a>
SMART Config URI	<a href="https://api.tronshealth.com/.well-known/smart-configuration">https://api.tronshealth.com/.well-known/smart-configuration</a>



### 11.3. Additional Data Supported (Disclosure per ONC Requirements)

Per ONC transparency requirements, TronsHealth discloses the following additional data elements supported by the Health IT Module beyond the USCDI v3 baseline:

- SDOH (Social Determinants of Health) via US Core SDOH Observation profiles — food insecurity, housing instability, transportation, education.
- Pregnancy Status: Observation (LOINC 82810-3).
- Disability Status: Observation (LOINC 89571-4).
- Gender Identity: US Core Gender Identity extension on Patient resource.
- Clinical Notes (9 types per USCDI v3): Progress notes, discharge summaries, H&P, referral notes, operative notes, consultation notes, imaging narratives, lab reports, pathology reports — via DiagnosticReport and DocumentReference.
- Implantable Device: US Core Implantable Device Profile with UDI, device type, status.
- Care Team: US Core CareTeam Profile with members, roles, and organizations.
- Pediatric Vital Signs: Weight-for-Height, BMI-for-Age, Head Occipital Circumference.
- Provenance: US Core Provenance Profile tracking data origin and transmission history.

## 12. FHIR R4 Resources – Patient Selection & Population Services

This section documents all 18 FHIR R4 resources supported by TronsHealth's g7/g10 API, including function names, syntax, parameters with data types, and mustSupport return fields per US Core IG v6.1.0

### 1.21. Patient

US Core Profile: US Core Patient Profile | FHIR Resource: Patient

**Function Names:** ReadPatient / SearchPatient

GET /fhir/r4/Patient/{id} (ReadPatient)

GET /fhir/r4/Patient?identifier={sys}{{val}}&name={name}&birthdate={date}&gender={g}  
(SearchPatient)

Parameter	Data Type	Required	Description
{id}	string	Yes*	FHIR Patient ID.
identifier	string	No	Business identifier. Format: system value.
name	string	No	Patient name (family or given).
birthdate	string (date)	No	Date of birth. Format: YYYY-MM-DD.
gender	string	No	male   female   other   unknown.



**mustSupport Return Fields (US Core IG v6.1.0):** id, identifier, name (family/given/prefix), gender, birthDate, address, telecom, communication.language, extension: us-core-race, us-core-ethnicity, us-core-birthsex, us-core-genderIdentity.

```
{
  "resourceType": "Patient",
  "id": "01000149148",
  "meta": {
    "versionId": "106",
    "lastUpdated": "2024-08-15T08:00:40.2470538+00:00"
  },
  "identifier": [
    {
      "type": {
        "coding": [
          {
            "system": "http://terminology.hl7.org/CodeSystem/v2-0203",
            "code": "MR",
            "display": "Medical Record Number"
          }
        ]
      },
      "text": "Medical Record Number"
    },
    {
      "system": "http://hospital.smarthealthit.org",
      "value": "01000149148"
    }
  ],
  "name": [
    {
      "use": "official",
      "family": "Ahmed",
      "given": [
        "Testing FHIR"
      ],
      "prefix": [
        "Mr."
      ]
    }
  ],
  "telecom": [
    {
      "system": "email",
      "value": "TestingFHIR@gmail.com",
    }
  ]
}
```



```
"use": "work"
},
{
  "system": "phone",
  "value": "(202) 020-2020",
  "use": "home"
},
{
  "system": "phone",
  "value": "(202) 020-2020",
  "use": "work"
},
{
  "system": "phone",
  "value": "(220) 202-0202",
  "use": "mobile"
}
],
"gender": "male",
"birthDate": "2024-08-01",
"address": [
  {
    "use": "home",
    "line": [
      "Testing FHIR"
    ],
    "city": "Reston",
    "state": "VA",
    "postalCode": "20190",
    "country": "US"
  },
  {
    "use": "temp",
    "line": [
      "Testing FHIR"
    ],
    "city": "Reston",
    "state": "VA",
    "postalCode": "20190",
    "country": "US"
  }
],
"maritalStatus": {
  "coding": [
```



```

{
  "system": "http://terminology.hl7.org/CodeSystem/v3-MaritalStatus",
  "code": "Married",
  "display": "Married"
}
],
"text": "Married"
},
"photo": [
  {
    "url": "ProfileImages\\7e1fbcdb-1a53-45db-9160-e2bc25ec22a2.jpg"
  }
],
"communication": [
  {
    "language": {
      "coding": [
        {
          "system": "urn:ietf:bcp:47",
          "code": "en-US",
          "display": "English"
        }
      ],
      "text": "English"
    }
  }
]
}

```

## 12.2. AllergyIntolerance

US Core Profile: US Core AllergyIntolerance Profile | FHIR Resource: AllergyIntolerance

**Function Names:** ReadAllergy / SearchAllergy

GET /fhir/r4/AllergyIntolerance/{id} (ReadAllergy)

GET /fhir/r4/AllergyIntolerance?patient={id}&clinical-status={s}&date={date} (SearchAllergy)

Parameter	Data Type	Required	Description
{id}	string	Yes*	AllergyIntolerance ID.
patient	string	Yes	Patient ID filter.
clinical-status	string	No	active   inactive   resolved.





```
{
  "resourceType": "AllergyIntolerance",
  "id": "170",
  "clinicalStatus": {
    "coding": [
      {
        "system": "http://terminology.hl7.org/CodeSystem/allergyintolerance-clinical",
        "code": "active",
        "display": "Active"
      }
    ]
  },
  "verificationStatus": {
    "coding": [
      {
        "system": "http://terminology.hl7.org/CodeSystem/allergyintolerance-verification",
        "code": "confirmed",
        "display": "Confirmed"
      }
    ]
  },
  "category": [
    "medication"
  ],
  "criticality": "high",
  "code": {
    "coding": [
      {
        "system": "http://snomed.info/sct",
        "display": "Lysine"
      }
    ]
  },
  "patient": {
    "reference": "Patient/01000149148",
    "type": "Patient",
    "identifier": {
      "value": "01000149148"
    }
  },
  "reaction": [
    {
      "manifestation": [
        {

```



```
"coding": [  
  {  
    "system": "http://snomed.info/sct",  
    "display": "asd"  
  }  
]  
],  
"severity": "moderate"  
}  
]  
}
```

### 12.3. Care Plan

US Core Profile: US Core CarePlan Profile | FHIR Resource: CarePlan

**Function Names:** ReadCarePlan / SearchCarePlan

GET /fhir/r4/CarePlan/{id} (ReadCarePlan)

GET /fhir/r4/CarePlan?patient={id}&status={s}&category={cat}&date={date} (SearchCarePlan)

Parameter	Data Type	Required	Description
{id}	string	Yes*	CarePlan ID.
patient	string	<b>Yes</b>	Patient ID filter.
status	string	No	draft   active   on-hold   completed   revoked   unknown.
category	string	No	LOINC 38717-5 (care plan category).



**mustSupport Return Fields (US Core IG v6.1.0):** id, text (status=generated/additional — REQUIRED), status, intent, category (LOINC 38717-5), title, description, subject, period, author, activity.

```
{
  "resourceType": "CarePlan",
  "id": "30",

  "meta": {
    "profile": [
      "http://hl7.org/fhir/us/core/StructureDefinition/us-core-careplan"
    ]
  },

  "text": {
    "status": "generated",
    "div": "<div xmlns=\\"http://www.w3.org/1999/xhtml\">Care Plan for Self-care interventions (procedure).<br>Activities:<ul><li>Diffuse traumatic brain injury with loss of consciousness status unknown, initial encounter</li><li>Malar fracture, right side, initial encounter for closed fracture</li></ul></div>"
  },

  "status": "active",
  "intent": "plan",

  "category": [
    {
      "coding": [
        {
          "system": "http://terminology.hl7.org/CodeSystem/care-plan-category",
          "code": "assess-plan",
          "display": "Assessment and Plan of Treatment"
        }
      ],
      "text": "Assessment and Plan"
    }
  ],

  "description": "Diffuse traumatic brain injury with loss of consciousness status unknown, initial encounter",

  "subject": {
    "reference": "Patient/01000149148"
  },
}
```



```
"period": {  
  "start": "2024-08-15"  
}
```

#### 12.4. Goal

US Core Profile: US Core Goal Profile | FHIR Resource: Goal

**Function Names:** ReadGoal / SearchGoal

GET /fhir/r4/Goal/{id} (ReadGoal)

GET /fhir/r4/Goal?patient={id}&lifecycle-status={s}&target-date={date} (SearchGoal)

Parameter	Data Type	Required	Description
{id}	string	Yes*	Goal ID.
patient	string	Yes	Patient ID filter.
lifecycle-status	string	No	proposed   accepted   active   completed   cancelled.



**mustSupport Return Fields (US Core IG v6.1.0):** id, lifecycleStatus, achievementStatus, description, subject, startDate, target.measure (LOINC), target.detailQuantity, target.dueDate, note.

```
{
  "resourceType": "Goal",
  "id": "31",

  "meta": {
    "profile": [
      "http://hl7.org/fhir/us/core/StructureDefinition/us-core-goal"
    ]
  },

  "lifecycleStatus": "active",

  "description": {
    "coding": [
      {
        "system": "http://snomed.info/sct",
        "code": "71620000",
        "display": "Malar fracture, right side, initial encounter for closed fracture"
      }
    ],
    "text": "Malar fracture, right side, initial encounter for closed fracture"
  },

  "subject": {
    "reference": "Patient/01000149148"
  },
  "target": [
    {
      "dueDate": "2024-08-09"
    }
  ]
}
```

## 12.5. Immunization

US Core Profile: US Core Immunization Profile | FHIR Resource: Immunization

**Function Names:** ReadImmunization / SearchImmunization

GET /fhir/r4/Immunization/{id} (ReadImmunization)

GET /fhir/r4/Immunization?patient={id}&status={s}&date={date} (SearchImmunization)



Parameter	Data Type	Required	Description
{id}	string	Yes*	Immunization ID.
patient	string	<b>Yes</b>	Patient ID filter.
status	string	No	completed   entered-in-error   not-done.
date	string	No	Immunization date. Format: YYYY-MM-DD.



**mustSupport Return Fields (US Core IG v6.1.0):** id, status, statusReason, vaccineCode (CVX), patient, occurrenceDateTime, primarySource, lotNumber, site, route, doseQuantity, performer, note, isSubpotent.

```
{
  "resourceType": "Immunization",
  "id": "25",

  "meta": {
    "profile": [
      "http://hl7.org/fhir/us/core/StructureDefinition/us-core-immunization"
    ]
  },

  "status": "completed",

  "vaccineCode": {
    "coding": [
      {
        "system": "http://hl7.org/fhir/sid/cvx",
        "code": "217",
        "display": "COVID-19, mRNA, LNP-S, PF, 30 mcg/0.3 mL dose"
      }
    ],
    "text": "COVID-19 vaccine"
  },

  "patient": {
    "reference": "Patient/01000149148"
  },

  "occurrenceDateTime": "2024-08-09",

  "recorded": "2024-08-09",

  "primarySource": true,

  "lotNumber": "02170AS",

  "expirationDate": "2024-08-09"
}
```

## 12.6. Condition



US Core Profile: US Core Condition Profile | FHIR Resource: Condition

**Function Names:** ReadCondition / SearchCondition

GET /fhir/r4/Condition/{id} (ReadCondition)

GET /fhir/r4/Condition?patient={id}&category={cat}&clinical-status={s}&code={code}  
(SearchCondition)

Parameter	Data Type	Required	Description
{id}	string	Yes*	Condition ID.
patient	string	<b>Yes</b>	Patient ID filter.
category	string	No	problem-list-item   health-concern   encounter-diagnosis.
clinical-status	string	No	active   recurrence   inactive   remission   resolved.
code	string	No	ICD-10-CM or SNOMED CT code filter.



**mustSupport Return Fields (US Core IG v6.1.0):** id, clinicalStatus, verificationStatus, category, severity, code (ICD-10-CM/SNOMED CT), subject, onsetDateTime, abatementDateTime, recordedDate, note.

```
{
  "resourceType": "Condition",
  "id": "488",

  "meta": {
    "profile": [
      "http://hl7.org/fhir/us/core/StructureDefinition/us-core-condition"
    ]
  },

  "clinicalStatus": {
    "coding": [
      {
        "system": "http://terminology.hl7.org/CodeSystem/condition-clinical",
        "code": "active",
        "display": "Active"
      }
    ]
  },

  "verificationStatus": {
    "coding": [
      {
        "system": "http://terminology.hl7.org/CodeSystem/condition-ver-status",
        "code": "confirmed",
        "display": "Confirmed"
      }
    ]
  },

  "category": [
    {
      "coding": [
        {
          "system": "http://terminology.hl7.org/CodeSystem/condition-category",
          "code": "encounter-diagnosis",
          "display": "Encounter Diagnosis"
        }
      ]
    },
    "text": "Encounter Diagnosis"
  ]
}
```



```
],  
  "code": {  
    "coding": [  
      {  
        "system": "http://hl7.org/fhir/sid/icd-10-cm",  
        "code": "N75.1",  
        "display": "Abscess of Bartholin's gland"  
      }  
    ],  
    "text": "Abscess of Bartholin's gland"  
  },  
  "subject": {  
    "reference": "Patient/01000149148"  
  },  
  "onsetDateTime": "2024-08-09"  
}
```

### 12.7. MedicationRequest

US Core Profile: US Core MedicationRequest Profile | FHIR Resource: MedicationRequest

**Function Names:** ReadMedicationRequest / SearchMedicationRequest

GET /fhir/r4/MedicationRequest/{id} (ReadMedicationRequest)

GET /fhir/r4/MedicationRequest?patient={id}&status={s}&intent={intent}&authoredon={date}  
(SearchMedicationRequest)

Parameter	Data Type	Required	Description
{id}	string	Yes*	MedicationRequest ID.
patient	string	Yes	Patient ID filter.
status	string	No	active   completed   cancelled   on-hold   stopped   unknown.
intent	string	No	proposal   plan   order   instance-order.
authoredon	string	No	Date authored. Format: YYYY-MM-DD.



**mustSupport Return Fields (US Core IG v6.1.0):** id, status, intent, medicationCodeableConcept (RxNorm), subject, authoredOn, requester, reasonCode, dosageInstruction (text, timing, route, doseAndRate), dispenseRequest.

```
{
  "resourceType": "MedicationRequest",
  "id": "190",

  "meta": {
    "profile": [
      "http://hl7.org/fhir/us/core/StructureDefinition/us-core-medicationrequest"
    ]
  },

  "status": "on-hold",
  "intent": "proposal",
  "priority": "routine",

  "medicationCodeableConcept": {
    "coding": [
      {
        "system": "http://www.nlm.nih.gov/research/umls/rxnorm",
        "code": "2199685",
        "display": "tenapanor"
      }
    ],
    "text": "Tenapanor"
  },

  "subject": {
    "reference": "Patient/01000149148"
  },

  "encounter": {
    "reference": "Encounter/521"
  },

  "authoredOn": "2024-08-09",

  "requester": {
    "display": "John Rush"
  },

  "dosageInstruction": [
```



```

{
  "text": "Take as directed",

  "route": {
    "coding": [
      {
        "system": "http://snomed.info/sct",
        "code": "26643006",
        "display": "Oral route"
      }
    ]
  },

  "doseAndRate": [
    {
      "doseQuantity": {
        "value": 1,
        "unit": "applicator"
      }
    }
  ]
}
]
}

```

### 12.8. Implantable Devices

US Core Profile: US Core Implantable Device Profile | FHIR Resource: Device

**Function Names:** ReadDevice / SearchDevice

GET /fhir/r4/Device/{id} (ReadDevice)

GET /fhir/r4/Device?patient={id}&type={type}&status={s} (SearchDevice)

Parameter	Data Type	Required	Description
{id}	string	Yes*	Device ID.
patient	string	Yes	Patient ID filter.
type	string	No	Device type code (SNOMED CT/GMDN).
status	string	No	active   inactive   entered-in-error   unknown.



**mustSupport Return Fields (US Core IG v6.1.0):** id, udiCarrier (deviceIdentifier, carrierHRF), status, distinctIdentifier, manufacturer, manufactureDate, expirationDate, lotNumber, serialNumber, type (SNOMED CT), patient.

```
{
  "resourceType": "Device",
  "id": "31",

  "meta": {
    "profile": [
      "http://hl7.org/fhir/us/core/StructureDefinition/us-core-implantable-device"
    ]
  },

  "udiCarrier": [
    {
      "deviceIdentifier": "00382900123456",
      "issuer": "http://hl7.org/fhir/NamingSystem/gs1-di",
      "jurisdiction": "http://hl7.org/fhir/NamingSystem/fda-udi",
      "carrierHRF": "(01)00382900123456(17)110331",
      "entryType": "manual"
    }
  ],

  "status": "inactive",

  "distinctIdentifier": "00382900123456",
  "manufactureDate": "2014-03-03",
  "expirationDate": "2014-03-03",
  "lotNumber": "00382900123456",
  "serialNumber": "00382900123456",

  "type": {
    "coding": [
      {
        "system": "http://snomed.info/sct",
        "code": "304120007",
        "display": "Zimmon biliary stent"
      }
    ]
  },
  "text": "Zimmon biliary stent"
}
```



```

},
"patient": {
  "reference": "Patient/01000149148"
},
"safety": [
  {
    "coding": [
      {
        "system": "urn:oid:2.16.840.1.113883.3.26.1.1",
        "code": "C106047",
        "display": "Labeling does not contain MRI safety information"
      }
    ]
  }
]
}

```

### 12.9. Procedure

US Core Profile: US Core Procedure Profile | FHIR Resource: Procedure

**Function Names:** ReadProcedure / SearchProcedure

GET /fhir/r4/Procedure/{id} (ReadProcedure)

GET /fhir/r4/Procedure?patient={id}&date={date}&code={code}&status={s} (SearchProcedure)

Parameter	Data Type	Required	Description
{id}	string	Yes*	Procedure ID.
patient	string	<b>Yes</b>	Patient ID filter.
date	string	No	Procedure date filter.
code	string	No	CPT-4 or SNOMED CT code.
status	string	No	preparation   in-progress   completed   not-done   unknown.



**mustSupport Return Fields (US Core IG v6.1.0):** id, status, code (CPT-4/SNOMED CT), subject, performedDateTime or performedPeriod, performer, reasonCode, bodySite, outcome, note.

```
{
  "resourceType": "Procedure",
  "id": "719",

  "meta": {
    "profile": [
      "http://hl7.org/fhir/us/core/StructureDefinition/us-core-procedure"
    ]
  },

  "status": "completed",

  "category": {
    "coding": [
      {
        "system": "http://snomed.info/sct",
        "code": "103693007",
        "display": "Diagnostic procedure"
      }
    ],
    "text": "Diagnostic procedure"
  },

  "code": {
    "coding": [
      {
        "system": "http://snomed.info/sct",
        "code": "80146002",
        "display": "Appendectomy"
      }
    ],
    "text": "Appendectomy"
  },

  "subject": {
    "reference": "Patient/01000149148"
  },

  "performedDateTime": "2024-08-09"
}
```



}

### 12.10. Observation

US Core Profiles: Vital Signs, Laboratory Result, SDOH, Smoking Status, Pregnancy Status | FHIR Resource: Observation

**Function Names:** ReadObservation / SearchObservation

GET /fhir/r4/Observation/{id} (ReadObservation)

GET /fhir/r4/Observation?patient={id}&category={cat}&code={code}&date={date} (SearchObservation)

Parameter	Data Type	Required	Description
{id}	string	Yes*	Observation ID.
patient	string	Yes	Patient ID filter.
category	string	No	vital-signs   laboratory   social-history   survey.
code	string	No	LOINC code filter.
date	string (date)	No	Observation effective date filter.
status	string	No	registered   preliminary   final   amended   corrected   cancelled   unknown.



```
{
  "resourceType": "Observation",
  "id": "7",
  "meta": {
    "profile": [
      "http://hl7.org/fhir/us/core/StructureDefinition/us-core-smokingstatus"
    ]
  },
  "status": "final",
  "category": [
    {
      "coding": [
        {
          "system": "http://terminology.hl7.org/CodeSystem/observation-category",
          "code": "social-history",
          "display": "Social History"
        }
      ]
    }
  ],
  "code": {
    "coding": [
      {
        "system": "http://loinc.org",
        "code": "72166-2",
        "display": "Tobacco smoking status NHIS"
      }
    ]
  },
  "text": "Tobacco smoking status NHIS",
  "subject": {
    "reference": "Patient/01000149148",
    "type": "Patient",
    "identifier": {
      "system": "http://hospital.smarthealth.org/patients",
      "value": "01000149148"
    }
  },
  "encounter": {
    "reference": "Encounter/392"
  },
  "effectiveDateTime": "2024-08-05T10:11:32+05:00",
  "issued": "2024-08-05T10:11:32+05:00",
  "performer": [
```



```

{
  "reference": "Practitioner/12345",
  "display": "Dr. Jane Doe"
}
],
"valueCodeableConcept": {
  "coding": [
    {
      "system": "http://snomed.info/sct",
      "code": "266919005",
      "display": "Never smoked tobacco"
    }
  ],
  "text": "Never smoked tobacco"
}
}

```

### Observation Sub-Profiles and LOINC Codes

12.10.x Sub-Profile	LOINC Code	mustSupport Return Fields
12.10.1 Smoking Status	72166-2	status, code, subject, effectiveDateTime, valueCodeableConcept (SNOMED CT).
12.10.2 Pediatric Weight for Height	77606-2	status, code, subject, effectiveDateTime, valueQuantity (% , UCUM).
12.10.3 Body Height	8302-2	status, code, subject, effectiveDateTime, valueQuantity (cm or in, UCUM).
12.10.4 Body Weight	29463-7	status, code, subject, effectiveDateTime, valueQuantity (kg or lbs, UCUM).
12.10.5 Pulse Oximetry	59408-5	status, code, subject, effectiveDateTime, valueQuantity (% , UCUM), component.
12.10.6 Body Temperature	8310-5	status, code, subject, effectiveDateTime, valueQuantity (Cel or [degF], UCUM).
12.10.7 Blood Pressure	85354-9	status, code, component[systolic] (8480-6), component[diastolic] (8462-4), valueQuantity (mm[Hg]).
12.10.8 Heart Rate	8867-4	status, code, subject, effectiveDateTime, valueQuantity (/min, UCUM).
12.10.9 Pediatric BMI for Age	59576-9	status, code, subject, effectiveDateTime, valueQuantity (% , UCUM).
12.10.10 Respiratory Rate	9279-1	status, code, subject, effectiveDateTime, valueQuantity (/min, UCUM).
12.10.11 Laboratory Result	Various	status, category (laboratory), code (LOINC), valueQuantity or valueString, interpretation, referenceRange.



12.10.12 SDOH Observation	Various	status, category (social-history), code (LOINC/SNOMED CT), valueCodeableConcept or valueQuantity.
12.10.13 Pregnancy Status	82810-3	status, code, subject, effectiveDateTime, valueCodeableConcept.
12.10.14 Head Occipital Circumference	9843-4	status, code, subject, effectiveDateTime, valueQuantity (cm or in, UCUM).

### 12.11. Practitioner

US Core Profile: US Core Practitioner Profile | FHIR Resource: Practitioner

**Function Names:** ReadPractitioner / SearchPractitioner

GET /fhir/r4/Practitioner/{id} (ReadPractitioner)

GET /fhir/r4/Practitioner?identifier={npi}&name={name} (SearchPractitioner)

Parameter	Data Type	Required	Description
{id}	string	Yes*	Practitioner ID.
identifier	string	No	NPI. Format: system value.
name	string	No	Practitioner name search.



**mustSupport Return Fields (US Core IG v6.1.0):** id, identifier (NPI: system=http://hl7.org/fhir/sid/us-npi), name (family/given/prefix/suffix), qualification (code, issuer).

```
{
  "resourceType": "Practitioner",
  "id": "practitioner-tronshealth-1245319599",
  "meta": {
    "versionId": "2",
    "lastUpdated": "2025-09-30T13:35:19Z",
    "source": "https://api.tronshealth.com/fhir/r4",
    "profile": [
      "http://hl7.org/fhir/us/core/StructureDefinition/us-core-practitioner"
    ],
    "security": [
      {
        "system": "http://terminology.hl7.org/CodeSystem/v3-Confidentiality",
        "code": "N",
        "display": "Normal"
      }
    ],
    "tag": [
      {
        "system": "http://terminology.hl7.org/CodeSystem/v3-ObservationValue",
        "code": "SUBSETTED",
        "display": "Resource encoded in summary mode"
      }
    ]
  },
  "text": {
    "status": "generated",
    "div": "<div xmlns=\\"http://www.w3.org/1999/xhtml\"><p><b>Dr. John A. Doe, MD</b></p><p>NPI: 1245319599</p><p>Specialty: Internal Medicine</p><p>Organization: Services Center, Scottsdale AZ</p></div>"
  },
  "identifier": [
    {
      "use": "official",
      "type": {
        "coding": [
          {
            "system": "http://terminology.hl7.org/CodeSystem/v2-0203",
```



```
    "code": "NPI",
    "display": "National Provider Identifier"
  }
],
"text": "National Provider Identifier"
},
"system": "http://hl7.org/fhir/sid/us-npi",
"value": "1245319599",
"period": {
  "start": "2010-01-01"
},
"assigner": {
  "display": "Centers for Medicare & Medicaid Services (CMS)"
}
},
{
  "use": "official",
  "type": {
    "coding": [
      {
        "system": "http://terminology.hl7.org/CodeSystem/v2-0203",
        "code": "DEA",
        "display": "Drug Enforcement Administration Registration Number"
      }
    ],
    "text": "DEA Registration Number"
  },
  "system": "urn:oid:2.16.840.1.113883.4.814",
  "value": "BD1234563",
  "period": {
    "start": "2022-01-01",
    "end": "2027-12-31"
  }
},
{
  "use": "secondary",
  "type": {
    "coding": [
      {
        "system": "http://terminology.hl7.org/CodeSystem/v2-0203",
        "code": "PRN",
        "display": "Provider Number"
      }
    ],
  },
}
```



```
"text": "TronsHealth Internal Provider ID"
},
"system": "https://api.tronshealth.com/fhir/r4/NamingSystem/provider-id",
"value": "TH-PROV-0001"
}
],
```

```
"active": true,
```

```
"name": [
{
  "use": "official",
  "text": "Dr. John A. Doe, MD",
  "family": "Doe",
  "given": [
    "John",
    "Alexander"
  ],
  "prefix": [
    "Dr."
  ],
  "suffix": [
    "MD",
    "FACP"
  ],
  "period": {
    "start": "2010-01-01"
  }
}
],
```

```
"telecom": [
{
  "system": "phone",
  "value": "480-434-4356",
  "use": "work",
  "rank": 1
},
{
  "system": "fax",
  "value": "480-434-4357",
  "use": "work",
  "rank": 2
},
],
```



```
{
  "system": "email",
  "value": "john.doe@servicesCenter.com",
  "use": "work",
  "rank": 3
}
],

"address": [
  {
    "use": "work",
    "type": "both",
    "text": "7301 E 3RD AVE UNIT 311, Scottsdale, AZ 85251, US",
    "line": [
      "7301 E 3RD AVE UNIT 311"
    ],
    "city": "Scottsdale",
    "district": "Maricopa",
    "state": "AZ",
    "postalCode": "85251",
    "country": "US",
    "period": {
      "start": "2015-06-01"
    }
  }
],

"gender": "male",

"birthDate": "1975-04-15",

"photo": [
  {
    "contentType": "image/jpeg",
    "url": "https://api.tronshealth.com/fhir/r4/Practitioner/practitioner-tronshealth-1245319599/photo",
    "size": 2048,
    "title": "Dr. John Doe Profile Photo"
  }
],

"qualification": [
  {
    "identifier": [
      {
```



```
"use": "official",
"type": {
  "coding": [
    {
      "system": "http://terminology.hl7.org/CodeSystem/v2-0203",
      "code": "MD",
      "display": "Medical License Number"
    }
  ]
},
"system": "https://www.azmd.gov/Licensing",
"value": "AZ-MD-56789",
"period": {
  "start": "2005-07-01",
  "end": "2027-06-30"
}
],
"code": {
  "coding": [
    {
      "system": "http://terminology.hl7.org/CodeSystem/v2-0360",
      "code": "MD",
      "display": "Doctor of Medicine"
    }
  ],
  "text": "Doctor of Medicine (MD)"
},
"period": {
  "start": "2005-07-01",
  "end": "2027-06-30"
},
"issuer": {
  "display": "Arizona Medical Board"
}
},
{
  "identifier": [
    {
      "use": "official",
      "type": {
        "coding": [
          {
            "system": "http://terminology.hl7.org/CodeSystem/v2-0203",
```



```
    "code": "BC",
    "display": "Board Certification"
  }
],
"system": "https://www.abim.org/certification",
"value": "ABIM-IM-2019-112233",
"period": {
  "start": "2019-01-01",
  "end": "2029-12-31"
}
],
"code": {
  "coding": [
    {
      "system": "http://nucc.org/provider-taxonomy",
      "code": "207R00000X",
      "display": "Internal Medicine Physician"
    },
    {
      "system": "http://snomed.info/sct",
      "code": "419772000",
      "display": "Family practice specialist (occupation)"
    }
  ],
  "text": "Board Certified — Internal Medicine"
},
"period": {
  "start": "2019-01-01",
  "end": "2029-12-31"
},
"issuer": {
  "display": "American Board of Internal Medicine (ABIM)"
}
],
{
  "identifier": [
    {
      "use": "official",
      "system": "https://www.acgme.org/residency",
      "value": "ACGME-RES-2003-445566"
    }
  ],
}
```



```
"code": {
  "coding": [
    {
      "system": "http://terminology.hl7.org/CodeSystem/v2-0360",
      "code": "MD",
      "display": "Residency — Internal Medicine"
    }
  ],
  "text": "Residency — Internal Medicine"
},
"period": {
  "start": "2001-07-01",
  "end": "2005-06-30"
},
"issuer": {
  "display": "Mayo Clinic — ACGME Accredited Internal Medicine Residency Program"
}
},
],
"communication": [
  {
    "coding": [
      {
        "system": "urn:ietf:bcp:47",
        "code": "en",
        "display": "English"
      }
    ],
    "text": "English"
  },
  {
    "coding": [
      {
        "system": "urn:ietf:bcp:47",
        "code": "es",
        "display": "Spanish"
      }
    ],
    "text": "Spanish"
  }
]
}
```



## 12.12. Organization

US Core Profile: US Core Organization Profile | FHIR Resource: Organization

**Function Names:** ReadOrganization / SearchOrganization

GET /fhir/r4/Organization/{id} (ReadOrganization)

GET /fhir/r4/Organization?identifier={id}&name={name}&address-city={city} (SearchOrganization)

Parameter	Data Type	Required	Description
{id}	string	Yes*	Organization ID.
identifier	string	No	NPI or Tax ID.
name	string	No	Organization name.



**mustSupport Return Fields (US Core IG v6.1.0):** id, identifier (NPI/Tax ID), active, type, name, telecom, address.

```
{
  "resourceType": "Organization",
  "id": "org-tronshealth-servicesCenter-0001",
  "meta": {
    "versionId": "3",
    "lastUpdated": "2025-09-30T13:35:19Z",
    "source": "https://api.tronshealth.com/fhir/r4",
    "profile": [
      "http://hl7.org/fhir/us/core/StructureDefinition/us-core-organization"
    ],
    "security": [
      {
        "system": "http://terminology.hl7.org/CodeSystem/v3-Confidentiality",
        "code": "N",
        "display": "Normal"
      }
    ],
    "tag": [
      {
        "system": "http://terminology.hl7.org/CodeSystem/v3-ActReason",
        "code": "HRESCH",
        "display": "healthcare research"
      }
    ]
  },
  "text": {
    "status": "generated",
    "div": "<div xmlns=\"http://www.w3.org/1999/xhtml\"><p><b>Services Center</b></p><p>Type: Healthcare Provider Organization</p><p>NPI: 1669498739</p><p>Tax ID (EIN): 86-0012345</p><p>Address: 7301 E 3RD AVE UNIT 311, Scottsdale, AZ 85251, US</p><p>Phone: 480-434-4356</p><p>Status: Active</p></div>"
  },
}
```



```
"identifier": [  
  {  
    "use": "official",  
    "type": {  
      "coding": [  
        {  
          "system": "http://terminology.hl7.org/CodeSystem/v2-0203",  
          "code": "NPI",  
          "display": "National Provider Identifier"  
        }  
      ],  
      "text": "National Provider Identifier"  
    },  
    "system": "http://hl7.org/fhir/sid/us-npi",  
    "value": "1669498739",  
    "period": {  
      "start": "2008-03-15"  
    },  
    "assigner": {  
      "display": "Centers for Medicare & Medicaid Services (CMS)"  
    }  
  },  
  {  
    "use": "official",  
    "type": {  
      "coding": [  
        {  
          "system": "http://terminology.hl7.org/CodeSystem/v2-0203",  
          "code": "TAX",  
          "display": "Tax ID Number"  
        }  
      ],  
      "text": "Employer Identification Number (EIN / Tax ID)"  
    }  
  }  
]
```



```
},
"system": "urn:oid:2.16.840.1.113883.4.4",
"value": "86-0012345",
"period": {
  "start": "2003-01-01"
},
"assigner": {
  "display": "Internal Revenue Service (IRS)"
}
},
{
  "use": "secondary",
  "type": {
    "coding": [
      {
        "system": "http://terminology.hl7.org/CodeSystem/v2-0203",
        "code": "PRN",
        "display": "Provider Number"
      }
    ],
    "text": "TronsHealth Internal Organization ID"
  },
  "system": "https://api.tronshealth.com/fhir/r4/NamingSystem/organization-id",
  "value": "TH-ORG-0001"
},
{
  "use": "official",
  "type": {
    "coding": [
      {
        "system": "http://terminology.hl7.org/CodeSystem/v2-0203",
        "code": "SL",
        "display": "State License"
      }
    ]
  }
}
```



```
],
  "text": "Arizona Healthcare Facility License"
},
"system": "https://www.azdhs.gov/licensing",
"value": "AZ-FAC-LIC-2024-00321",
"period": {
  "start": "2024-01-01",
  "end": "2026-12-31"
},
"assigner": {
  "display": "Arizona Department of Health Services (AZDHS)"
}
},
{
  "use": "official",
  "type": {
    "coding": [
      {
        "system": "http://terminology.hl7.org/CodeSystem/v2-0203",
        "code": "CLIA",
        "display": "Clinical Laboratory Improvement Amendment Number"
      }
    ],
    "text": "CLIA Number"
  },
  "system": "urn:oid:2.16.840.1.113883.4.7",
  "value": "03D2198765",
  "period": {
    "start": "2020-06-01",
    "end": "2026-05-31"
  },
  "assigner": {
    "display": "Centers for Medicare & Medicaid Services (CMS) — CLIA"
  }
}
```



```
}  
],  
  
"active": true,  
  
"type": [  
  {  
    "coding": [  
      {  
        "system": "http://terminology.hl7.org/CodeSystem/organization-type",  
        "code": "prov",  
        "display": "Healthcare Provider"  
      }  
    ],  
    "text": "Healthcare Provider Organization"  
  },  
  {  
    "coding": [  
      {  
        "system": "http://nucc.org/provider-taxonomy",  
        "code": "261QP2300X",  
        "display": "Primary Care Clinic/Center"  
      }  
    ],  
    "text": "Primary Care Clinic / Multi-Specialty Practice"  
  },  
  {  
    "coding": [  
      {  
        "system": "http://snomed.info/sct",  
        "code": "394761003",  
        "display": "General practitioner (occupation)"  
      }  
    ]  
  }  
]
```



```
],
  "text": "General Practice — Ambulatory Care"
}
],

"name": "Services Center",

"alias": [
  "TronsHealth Services Center",
  "Services Center — Scottsdale"
],

"telecom": [
  {
    "system": "phone",
    "value": "480-434-4356",
    "use": "work",
    "rank": 1,
    "period": {
      "start": "2010-01-01"
    }
  },
  {
    "system": "fax",
    "value": "480-434-4357",
    "use": "work",
    "rank": 2
  },
  {
    "system": "email",
    "value": "info@servicescenter.tronshealth.com",
    "use": "work",
    "rank": 3
  }
]
```



```
},
{
  "system": "url",
  "value": "https://www.tronshealth.com",
  "use": "work",
  "rank": 4
},
{
  "system": "phone",
  "value": "1-800-555-0199",
  "use": "work",
  "rank": 5,
  "_system": {
    "extension": [
      {
        "url": "http://hl7.org/fhir/StructureDefinition/contactpoint-comment",
        "valueString": "Patient Scheduling & Appointments Hotline"
      }
    ]
  }
},
],

"address": [
  {
    "use": "work",
    "type": "both",
    "text": "7301 E 3RD AVE UNIT 311, Scottsdale, AZ 85251, US",
    "line": [
      "7301 E 3RD AVE",
      "UNIT 311"
    ],
    "city": "Scottsdale",
    "district": "Maricopa County",
```



```
"state": "AZ",
"postalCode": "85251",
"country": "US",
"period": {
  "start": "2010-06-01"
}
},
{
  "use": "billing",
  "type": "postal",
  "text": "PO Box 54321, Scottsdale, AZ 85252, US",
  "line": [
    "PO Box 54321"
  ],
  "city": "Scottsdale",
  "district": "Maricopa County",
  "state": "AZ",
  "postalCode": "85252",
  "country": "US",
  "period": {
    "start": "2010-06-01"
  }
}
],
"partOf": {
  "reference": "Organization/org-tronshealth-parent-network",
  "display": "TronsHealth LLC — Parent Network"
},
"contact": [
  {
    "purpose": {
```



```
"coding": [  
  {  
    "system": "http://terminology.hl7.org/CodeSystem/contactentity-type",  
    "code": "ADMIN",  
    "display": "Administrative"  
  }  
],  
"text": "Administrative Contact"  
},  
"name": {  
  "use": "official",  
  "family": "Smith",  
  "given": ["Jane"],  
  "prefix": ["Ms."]  
},  
"telecom": [  
  {  
    "system": "phone",  
    "value": "480-434-4360",  
    "use": "work"  
  },  
  {  
    "system": "email",  
    "value": "jane.smith@servicescenter.tronshealth.com",  
    "use": "work"  
  }  
],  
"address": {  
  "use": "work",  
  "line": ["7301 E 3RD AVE UNIT 311"],  
  "city": "Scottsdale",  
  "state": "AZ",  
  "postalCode": "85251",  
  "country": "US"
```



```
}
},
{
  "purpose": {
    "coding": [
      {
        "system": "http://terminology.hl7.org/CodeSystem/contactentity-type",
        "code": "PAYOR",
        "display": "Payroll"
      }
    ],
    "text": "Billing & Insurance Contact"
  },
  "name": {
    "use": "official",
    "family": "Johnson",
    "given": ["Robert"],
    "prefix": ["Mr."]
  },
  "telecom": [
    {
      "system": "phone",
      "value": "480-434-4365",
      "use": "work"
    },
    {
      "system": "email",
      "value": "billing@servicescenter.tronshealth.com",
      "use": "work"
    }
  ]
},
{
  "purpose": {
```



```
"coding": [  
  {  
    "system": "http://terminology.hl7.org/CodeSystem/contactentity-type",  
    "code": "PATINF",  
    "display": "Patient"  
  }  
],  
"text": "Patient Services / Privacy Officer"  
},  
"name": {  
  "use": "official",  
  "family": "Williams",  
  "given": ["Sarah"],  
  "prefix": ["Dr."],  
  "suffix": ["JD"]  
},  
"telecom": [  
  {  
    "system": "phone",  
    "value": "480-434-4370",  
    "use": "work"  
  },  
  {  
    "system": "email",  
    "value": "privacy@servicescenter.tronshealth.com",  
    "use": "work"  
  }  
]  
},  
],  
  
"endpoint": [  
  {  
    "reference": "Endpoint/endpoint-tronshealth-fhir-r4",
```



```
"display": "TronsHealth FHIR R4 API Endpoint"
},
{
  "reference": "Endpoint/endpoint-tronshealth-direct",
  "display": "TronsHealth Direct Messaging Endpoint"
}
],

"extension": [
  {
    "url": "http://hl7.org/fhir/us/core/StructureDefinition/us-core-jurisdiction",
    "valueCodeableConcept": {
      "coding": [
        {
          "system": "https://www.usps.com/",
          "code": "AZ",
          "display": "Arizona"
        }
      ],
      "text": "State of Arizona"
    }
  },
  {
    "url": "http://hl7.org/fhir/StructureDefinition/organization-period",
    "valuePeriod": {
      "start": "2003-01-01"
    }
  },
  {
    "url": "http://hl7.org/fhir/StructureDefinition/organization-qualification",
    "extension": [
      {
        "url": "code",
        "valueCodeableConcept": {
```



```
"coding": [  
  {  
    "system": "http://nucc.org/provider-taxonomy",  
    "code": "261QP2300X",  
    "display": "Primary Care Clinic/Center"  
  }  
]  
},  
{  
  "url": "status",  
  "valueCode": "active"  
},  
{  
  "url": "period",  
  "valuePeriod": {  
    "start": "2024-01-01",  
    "end": "2026-12-31"  
  }  
},  
{  
  "url": "issuer",  
  "valueReference": {  
    "display": "The Joint Commission (TJC) — Ambulatory Care Accreditation"  
  }  
}  
]  
}  
]
```

### 12.13. Head-Occipital Circumference



Head Occipital Circumference is documented as Observation sub-profile 12.10.14. LOINC code: 9843-4. Refer to Section 12.10 for full parameter, syntax, and return variable details.

### 12.14. CareTeam

US Core Profile: US Core CareTeam Profile | FHIR Resource: CareTeam

**Function Names:** ReadCareTeam / SearchCareTeam

GET /fhir/r4/CareTeam/{id} (ReadCareTeam)

GET /fhir/r4/CareTeam?patient={id}&status={s}&date={date} (SearchCareTeam)

Parameter	Data Type	Required	Description
{id}	string	Yes*	CareTeam ID.
patient	string	Yes	Patient ID filter.
status	string	No	proposed   active   suspended   inactive   entered-in-error.
date	string	No	Period filter.



**mustSupport Return Fields (US Core IG v6.1.0):** id, status, name, subject, period, participant (role [SNOMED CT], member [Practitioner/Patient/Organization], onBehalfOf), reasonCode, managingOrganization, note.

```
{
  "resourceType": "CareTeam",
  "id": "careteam-tronshealth-patient-71299",
  "meta": {
    "versionId": "2",
    "lastUpdated": "2025-09-30T13:35:19Z",
    "source": "https://api.tronshealth.com/fhir/r4",
    "profile": [
      "http://hl7.org/fhir/us/core/StructureDefinition/us-core-careteam"
    ],
    "security": [
      {
        "system": "http://terminology.hl7.org/CodeSystem/v3-Confidentiality",
        "code": "N",
        "display": "Normal"
      }
    ],
    "tag": [
      {
        "system": "http://terminology.hl7.org/CodeSystem/v3-ActReason",
        "code": "TREAT",
        "display": "Treatment"
      }
    ]
  },
  "text": {
    "status": "generated",
```



```
"div": "<div xmlns='http://www.w3.org/1999/xhtml'><p><b>Care Team: Martin Blue — Primary Care Team</b></p><p>Status: Active</p><p>Patient: Martin Blue (ID: 71299)</p><p>Period: 2024-09-30 to present</p><p>Managing Organization: Services Center, Scottsdale AZ</p><p>Members: Dr. John Doe (Primary Care Physician), Dr. Sarah Lee (Cardiologist), Nurse Emily Brown (Care Coordinator), Martin Blue (Patient), Services Center (Organization)</p></div>"
```

```
},
```

```
"identifier": [
```

```
{
```

```
  "use": "official",
```

```
  "type": {
```

```
    "coding": [
```

```
      {
```

```
        "system": "http://terminology.hl7.org/CodeSystem/v2-0203",
```

```
        "code": "FILL",
```

```
        "display": "Filler Identifier"
```

```
      }
```

```
    ],
```

```
    "text": "TronsHealth CareTeam Identifier"
```

```
  },
```

```
  "system": "https://api.tronshealth.com/fhir/r4/NamingSystem/careteam-id",
```

```
  "value": "TH-CT-71299-001",
```

```
  "period": {
```

```
    "start": "2024-09-30"
```

```
  },
```

```
  "assigner": {
```

```
    "reference": "Organization/org-tronshealth-servicesCenter-0001",
```

```
    "display": "Services Center"
```

```
  }
```

```
}
```

```
],
```

```
"status": "active",
```



```
"category": [  
  {  
    "coding": [  
      {  
        "system": "http://loinc.org",  
        "code": "LA28865-6",  
        "display": "Longitudinal care-coordination focused care team"  
      }  
    ],  
    "text": "Longitudinal Care-Coordination Care Team"  
  },  
  {  
    "coding": [  
      {  
        "system": "http://loinc.org",  
        "code": "LA27976-2",  
        "display": "Episode of care-focused care team"  
      }  
    ],  
    "text": "Episode of Care — Chronic Disease Management"  
  }  
],
```

```
"name": "Martin Blue — Primary Care Team",
```

```
"subject": {  
  "reference": "Patient/71299",  
  "display": "Martin Blue"  
},
```

```
"encounter": {  
  "reference": "Encounter/encounter-tronshealth-71299-20240930",  
  "display": "Outpatient Visit — 2024-09-30"
```



```
},  
  
"period": {  
  "start": "2024-09-30"  
},  
  
"participant": [  
  {  
    "role": [  
      {  
        "coding": [  
          {  
            "system": "http://snomed.info/sct",  
            "code": "446050000",  
            "display": "Primary care physician (occupation)"  
          },  
          {  
            "system": "http://nucc.org/provider-taxonomy",  
            "code": "207R00000X",  
            "display": "Internal Medicine Physician"  
          }  
        ],  
      ],  
      "text": "Primary Care Physician — Internal Medicine"  
    }  
  ],  
  "member": {  
    "reference": "Practitioner/practitioner-tronshealth-1245319599",  
    "display": "Dr. John A. Doe, MD"  
  },  
  "onBehalfOf": {  
    "reference": "Organization/org-tronshealth-servicesCenter-0001",  
    "display": "Services Center"  
  }  
],
```



```
"period": {
  "start": "2024-09-30"
},
{
  "role": [
    {
      "coding": [
        {
          "system": "http://snomed.info/sct",
          "code": "17561000",
          "display": "Cardiologist (occupation)"
        },
        {
          "system": "http://nucc.org/provider-taxonomy",
          "code": "207RC0000X",
          "display": "Cardiovascular Disease Physician"
        }
      ],
      "text": "Cardiologist — Cardiovascular Disease"
    }
  ],
  "member": {
    "reference": "Practitioner/practitioner-tronshealth-9876543210",
    "display": "Dr. Sarah Lee, MD, FACC"
  },
  "onBehalfOf": {
    "reference": "Organization/org-tronshealth-servicesCenter-0001",
    "display": "Services Center"
  },
  "period": {
    "start": "2024-10-15"
  }
},
```



```
{
  "role": [
    {
      "coding": [
        {
          "system": "http://snomed.info/sct",
          "code": "224571005",
          "display": "Nurse care coordinator (occupation)"
        },
        {
          "system": "http://nucc.org/provider-taxonomy",
          "code": "163W00000X",
          "display": "Registered Nurse"
        }
      ],
      "text": "Registered Nurse — Care Coordinator"
    }
  ],
  "member": {
    "reference": "Practitioner/practitioner-tronshealth-1122334455",
    "display": "Emily Brown, RN, CCM"
  },
  "onBehalfOf": {
    "reference": "Organization/org-tronshealth-servicesCenter-0001",
    "display": "Services Center"
  },
  "period": {
    "start": "2024-09-30"
  }
},
{
  "role": [
    {
      "coding": [
```



```
{
  "system": "http://snomed.info/sct",
  "code": "159026005",
  "display": "Dietitian (occupation)"
},
{
  "system": "http://nucc.org/provider-taxonomy",
  "code": "133V00000X",
  "display": "Dietitian, Registered"
}
],
"text": "Registered Dietitian — Nutritional Counseling"
}
],
"member": {
  "reference": "Practitioner/practitioner-tronshealth-5566778899",
  "display": "Maria Gonzalez, RD, LDN"
},
"onBehalfOf": {
  "reference": "Organization/org-tronshealth-servicesCenter-0001",
  "display": "Services Center"
},
"period": {
  "start": "2024-11-01"
}
},
{
  "role": [
    {
      "coding": [
        {
          "system": "http://snomed.info/sct",
          "code": "116154003",
          "display": "Patient (person)"
        }
      ]
    }
  ]
}
```



```
    }
  ],
  "text": "Patient — Active Care Team Member"
}
],
"member": {
  "reference": "Patient/71299",
  "display": "Martin Blue"
},
"period": {
  "start": "2024-09-30"
}
},
{
  "role": [
    {
      "coding": [
        {
          "system": "http://snomed.info/sct",
          "code": "308050009",
          "display": "Community health organization (qualifier value)"
        },
        {
          "system": "http://nucc.org/provider-taxonomy",
          "code": "251300000X",
          "display": "Local Education Agency (LEA)"
        }
      ]
    },
    {
      "text": "Managing Healthcare Organization"
    }
  ]
},
"member": {
  "reference": "Organization/org-tronshealth-servicesCenter-0001",
  "display": "Services Center"
}
```



```
},
"period": {
  "start": "2024-09-30"
}
},
{
  "role": [
    {
      "coding": [
        {
          "system": "http://snomed.info/sct",
          "code": "394602003",
          "display": "Psychiatry specialist (occupation)"
        },
        {
          "system": "http://nucc.org/provider-taxonomy",
          "code": "2084P0800X",
          "display": "Psychiatry Physician"
        }
      ],
      "text": "Psychiatrist — Behavioral Health Integration"
    }
  ],
  "member": {
    "reference": "Practitioner/practitioner-tronshealth-3344556677",
    "display": "Dr. Kevin Park, MD, MPH"
  },
  "onBehalfOf": {
    "reference": "Organization/org-tronshealth-behavioralHealth-0002",
    "display": "TronsHealth Behavioral Health Center"
  },
  "period": {
    "start": "2025-01-10"
  }
}
```



```
},
{
  "role": [
    {
      "coding": [
        {
          "system": "http://snomed.info/sct",
          "code": "713176007",
          "display": "Pharmacist prescriber (occupation)"
        },
        {
          "system": "http://nucc.org/provider-taxonomy",
          "code": "183500000X",
          "display": "Pharmacist"
        }
      ],
      "text": "Clinical Pharmacist — Medication Management"
    }
  ],
  "member": {
    "reference": "Practitioner/practitioner-tronshealth-9988776655",
    "display": "Dr. Aisha Patel, PharmD, BCPS"
  },
  "onBehalfOf": {
    "reference": "Organization/org-tronshealth-servicesCenter-0001",
    "display": "Services Center"
  },
  "period": {
    "start": "2024-10-01"
  }
}
],
"reasonCode": [
```



```
{
  "coding": [
    {
      "system": "http://snomed.info/sct",
      "code": "73211009",
      "display": "Diabetes mellitus (disorder)"
    },
    {
      "system": "http://hl7.org/fhir/sid/icd-10-cm",
      "code": "E11.9",
      "display": "Type 2 diabetes mellitus without complications"
    }
  ],
  "text": "Type 2 Diabetes Mellitus — Chronic Disease Management"
},
{
  "coding": [
    {
      "system": "http://snomed.info/sct",
      "code": "44054006",
      "display": "Diabetes mellitus type 2 (disorder)"
    },
    {
      "system": "http://hl7.org/fhir/sid/icd-10-cm",
      "code": "I10",
      "display": "Essential (primary) hypertension"
    }
  ],
  "text": "Essential Hypertension — Cardiovascular Risk Reduction"
},
{
  "coding": [
    {
      "system": "http://snomed.info/sct",
```



```
"code": "370992007",
"display": "Psychological distress (finding)"
},
{
"system": "http://hl7.org/fhir/sid/icd-10-cm",
"code": "F41.1",
"display": "Generalized anxiety disorder"
}
],
"text": "Generalized Anxiety Disorder — Behavioral Health Integration"
}
],
```

```
"reasonReference": [
{
"reference": "Condition/condition-tronshealth-71299-diabetes",
"display": "Type 2 Diabetes Mellitus — Active"
},
{
"reference": "Condition/condition-tronshealth-71299-hypertension",
"display": "Essential Hypertension — Active"
},
{
"reference": "Condition/condition-tronshealth-71299-anxiety",
"display": "Generalized Anxiety Disorder — Active"
}
],
```

```
"managingOrganization": [
{
"reference": "Organization/org-tronshealth-servicesCenter-0001",
"display": "Services Center — Scottsdale, AZ"
}
]
```



],

"telecom": [

{

"system": "phone",

"value": "480-434-4356",

"use": "work",

"rank": 1

},

{

"system": "email",

"value": "careteam-71299@servicescenter.tronshealth.com",

"use": "work",

"rank": 2

}

],

"note": [

{

"authorReference": {

"reference": "Practitioner/practitioner-tronshealth-1245319599",

"display": "Dr. John A. Doe, MD"

},

"time": "2024-09-30T10:15:00Z",

"text": "Care team assembled for comprehensive chronic disease management. Patient Martin Blue presents with Type 2 Diabetes Mellitus, Essential Hypertension, and Generalized Anxiety Disorder. Multidisciplinary approach coordinated across internal medicine, cardiology, nursing, dietetics, behavioral health, and clinical pharmacy."

},

{

"authorReference": {

"reference": "Practitioner/practitioner-tronshealth-1122334455",

"display": "Emily Brown, RN, CCM"

},



```
"time": "2025-01-15T09:00:00Z",
```

```
"text": "Care coordination review completed. Patient engaged with all team members. HbA1c trending down to 7.2%. Blood pressure controlled at 128/82 mmHg. Psychiatrist Dr. Park added to team for anxiety management. Follow-up scheduled for 2025-04-15."
```

```
},
```

```
{
```

```
"authorReference": {
```

```
"reference": "Practitioner/practitioner-tronshealth-9988776655",
```

```
"display": "Dr. Aisha Patel, PharmD, BCPS"
```

```
},
```

```
"time": "2025-02-01T11:30:00Z",
```

```
"text": "Medication reconciliation completed. Citalopram dose reviewed in context of diabetes and cardiovascular medications. No significant interactions identified. Metformin adherence confirmed. Patient educated on blood sugar monitoring and medication timing."
```

```
}
```

```
],
```

```
"extension": [
```

```
{
```

```
"url": "http://hl7.org/fhir/StructureDefinition/careteam-reasonReference",
```

```
"valueReference": {
```

```
"reference": "CarePlan/careplan-tronshealth-71299-diabetes-2024",
```

```
"display": "Diabetes Chronic Disease Management Care Plan — 2024"
```

```
}
```

```
},
```

```
{
```

```
"url": "http://hl7.org/fhir/us/core/StructureDefinition/us-core-race",
```

```
"extension": [
```

```
{
```

```
"url": "text",
```

```
"valueString": "Care team composition reflects USCDI v3 equity and diverse patient population requirements"
```

```
}
```

```
]
```

```
},
```



```

{
  "url": "http://hl7.org/fhir/StructureDefinition/request-statusReason",
  "valueCodeableConcept": {
    "coding": [
      {
        "system": "http://snomed.info/sct",
        "code": "406546001",
        "display": "Multidisciplinary care team (finding)"
      }
    ],
    "text": "Multidisciplinary Care Team — Assembled per ONC Care Coordination Requirements"
  }
}

```

### 12.15. Diagnostic Report

US Core provides two DiagnosticReport profiles: Laboratory Results Reporting and Note Exchange.

**Function Names:** ReadDiagnosticReport / SearchDiagnosticReport

GET /fhir/r4/DiagnosticReport/{id}

GET /fhir/r4/DiagnosticReport?patient={id}&category={cat}&code={code}&date={date}&status={s}

Parameter	Data Type	Required	Description
{id}	string	Yes*	DiagnosticReport ID.
patient	string	Yes	Patient ID filter.
category	string	No	LAB (laboratory)   LP29684-5 (radiology)   note exchange categories.
code	string	No	LOINC code for specific report type.
date	string	No	Report effective date filter.
status	string	No	registered   partial   preliminary   final   amended   corrected   cancelled   unknown.



### 12.15.1 Laboratory Results Profile — mustSupport Return Fields

id, status, category (LAB), code (LOINC), subject, effectiveDateTime, issued, performer, resultsInterpreter, specimen, result (Observation reference), conclusion, conclusionCode, presentedForm.

### 12.15.2 Note Exchange Profile — mustSupport Return Fields

id, status, category (note type LOINC codes), code (LOINC note type), subject, effectiveDateTime, performer, presentedForm (attachment: contentType + data/url), context.encounter.

## 12.16. DocumentReference

US Core Profile: US Core DocumentReference Profile | FHIR Resource: DocumentReference

**Function Names:** ReadDocumentReference / SearchDocumentReference

GET /fhir/r4/DocumentReference/{id} (ReadDocumentReference)

GET /fhir/r4/DocumentReference?patient={id}&type={loinc}&category={cat}&date={date}&status={s} (SearchDocumentReference)

Parameter	Data Type	Required	Description
{id}	string	Yes*	DocumentReference ID.
patient	string	<b>Yes</b>	Patient ID filter.
type	string	No	LOINC document type code.
category	string	No	clinical-note or other category.
date	string	No	Document date filter.
status	string	No	current   superseded   entered-in-error.



**mustSupport Return Fields (US Core IG v6.1.0):** id, status, type (LOINC), category, subject, date, author, custodian, content.attachment (contentType, data or url, title), context.encounter, context.period.

```
{
  "resourceType": "DocumentReference",
  "id": "docref-tronshealth-71299-progressnote-20240930",
  "meta": {
    "versionId": "2",
    "lastUpdated": "2025-09-30T13:35:19Z",
    "source": "https://api.tronshealth.com/fhir/r4",
    "profile": [
      "http://hl7.org/fhir/us/core/StructureDefinition/us-core-documentreference"
    ],
    "security": [
      {
        "system": "http://terminology.hl7.org/CodeSystem/v3-Confidentiality",
        "code": "N",
        "display": "Normal"
      }
    ],
    "tag": [
      {
        "system": "http://terminology.hl7.org/CodeSystem/v3-ActReason",
        "code": "TREAT",
        "display": "Treatment"
      }
    ]
  },
  "text": {
    "status": "generated",
```



```
"div": "<div xmlns=\"http://www.w3.org/1999/xhtml\"><p><b>Document: Progress Note — Martin Blue</b></p><p>Type: Progress Note (LOINC: 11506-3)</p><p>Category: Clinical Note</p><p>Status: Current</p><p>Date: 2024-09-30</p><p>Author: Dr. John A. Doe, MD</p><p>Custodian: Services Center, Scottsdale AZ</p><p>Encounter: Outpatient Visit — 2024-09-30</p></div>"
```

```
},
```

```
"identifier": [
```

```
{
```

```
  "use": "official",
```

```
  "type": {
```

```
    "coding": [
```

```
      {
```

```
        "system": "http://terminology.hl7.org/CodeSystem/v2-0203",
```

```
        "code": "FILL",
```

```
        "display": "Filler Identifier"
```

```
      }
```

```
    ],
```

```
    "text": "TronsHealth Document Identifier"
```

```
  },
```

```
  "system": "https://api.tronshealth.com/fhir/r4/NamingSystem/document-id",
```

```
  "value": "TH-DOC-71299-20240930-001",
```

```
  "period": {
```

```
    "start": "2024-09-30"
```

```
  },
```

```
  "assigner": {
```

```
    "reference": "Organization/org-tronshealth-servicesCenter-0001",
```

```
    "display": "Services Center"
```

```
  }
```

```
 }
```

```
],
```

```
"status": "current",
```

```
"docStatus": "final",
```



```
"type": {  
  "coding": [  
    {  
      "system": "http://loinc.org",  
      "code": "11506-3",  
      "display": "Progress note"  
    }  
  ],  
  "text": "Progress Note"  
},
```

```
"category": [  
  {  
    "coding": [  
      {  
        "system": "http://hl7.org/fhir/us/core/CodeSystem/us-core-documentreference-category",  
        "code": "clinical-note",  
        "display": "Clinical Note"  
      }  
    ],  
    "text": "Clinical Note"  
  }  
],
```

```
"subject": {  
  "reference": "Patient/71299",  
  "display": "Martin Blue"  
},
```

```
"date": "2024-09-30T10:15:00Z",
```

```
"author": [  

```



```
{
  "reference": "Practitioner/practitioner-tronshealth-1245319599",
  "display": "Dr. John A. Doe, MD"
},

"authenticator": {
  "reference": "Practitioner/practitioner-tronshealth-1245319599",
  "display": "Dr. John A. Doe, MD"
},

"custodian": {
  "reference": "Organization/org-tronshealth-servicesCenter-0001",
  "display": "Services Center"
},

"relatesTo": [
  {
    "code": "appends",
    "target": {
      "reference": "DocumentReference/docref-tronshealth-71299-progressnote-20240815",
      "display": "Previous Progress Note — 2024-08-15"
    }
  }
],

"description": "Outpatient progress note for Martin Blue. Visit focused on Type 2 Diabetes Mellitus management, Essential Hypertension follow-up, and medication reconciliation including Citalopram review.",

"securityLabel": [
  {
    "coding": [
```





```
"display": "Scanned Documents (text)"
}
},
{
  "attachment": {
    "contentType": "application/pdf",
    "language": "en-US",
    "url": "https://api.tronshealth.com/fhir/r4/DocumentReference/docref-tronshealth-71299-progressnote-20240930/content/pdf",
    "title": "Progress Note — Martin Blue — 2024-09-30 (PDF)",
    "creation": "2024-09-30T10:15:00Z",
    "size": 24576
  },
  "format": {
    "system": "http://ihe.net/fhir/ihe.formatcode.fhir/CodeSystem/formatcode",
    "code": "urn:ihe:iti:xds-sd:pdf:2008",
    "display": "Scanned Documents (PDF)"
  }
},
{
  "attachment": {
    "contentType": "text/html",
    "language": "en-US",
    "url": "https://api.tronshealth.com/fhir/r4/DocumentReference/docref-tronshealth-71299-progressnote-20240930/content/html",
    "title": "Progress Note — Martin Blue — 2024-09-30 (HTML)",
    "creation": "2024-09-30T10:15:00Z"
  },
  "format": {
    "system": "http://ihe.net/fhir/ihe.formatcode.fhir/CodeSystem/formatcode",
    "code": "urn:ihe:iti:xds-sd:text:2008",
    "display": "Scanned Documents (HTML)"
  }
}
}
```



],

"context": {

"encounter": [

{

"reference": "Encounter/encounter-tronshealth-71299-20240930",

"display": "Outpatient Visit — 2024-09-30"

}

],

"event": [

{

"coding": [

{

"system": "http://snomed.info/sct",

"code": "11429006",

"display": "Consultation (procedure)"

}

],

"text": "Outpatient Consultation — Chronic Disease Management"

}

],

"period": {

"start": "2024-09-30T09:00:00Z",

"end": "2024-09-30T10:30:00Z"

},

"facilityType": {

"coding": [

{

"system": "http://snomed.info/sct",

"code": "440655000",

"display": "Outpatient environment (environment)"

}

],

"text": "Outpatient Clinic"



```
},
"practiceSetting": {
  "coding": [
    {
      "system": "http://snomed.info/sct",
      "code": "408443003",
      "display": "General medical practice (qualifier value)"
    },
    {
      "system": "http://nucc.org/provider-taxonomy",
      "code": "207R00000X",
      "display": "Internal Medicine Physician"
    }
  ],
  "text": "General Internal Medicine — Ambulatory Care"
},
"sourcePatientInfo": {
  "reference": "Patient/71299",
  "display": "Martin Blue"
},
"related": [
  {
    "reference": "Condition/condition-tronshealth-71299-diabetes",
    "display": "Type 2 Diabetes Mellitus"
  },
  {
    "reference": "Condition/condition-tronshealth-71299-hypertension",
    "display": "Essential Hypertension"
  },
  {
    "reference": "MedicationRequest/medrx-tronshealth-71299-metformin",
    "display": "Metformin 500mg BID"
  },
  {
```



```

"reference": "MedicationRequest/medrx-tronshealth-71299-citalopram",
"display": "Citalopram 20mg QD"
}
]
},

"extension": [
{
"url": "http://hl7.org/fhir/StructureDefinition/workflow-episodeOfCare",
"valueReference": {
"reference": "EpisodeOfCare/episodeofcare-tronshealth-71299-diabetes-2024",
"display": "Diabetes Management Episode of Care — 2024"
}
},
{
"url": "http://hl7.org/fhir/StructureDefinition/documentreference-sourcepatient",
"valueReference": {
"reference": "Patient/71299",
"display": "Martin Blue"
}
}
]
}

```

### 12.17. Encounter

US Core Profile: US Core Encounter Profile | FHIR Resource: Encounter

**Function Names:** ReadEncounter / SearchEncounter

GET /fhir/r4/Encounter/{id} (ReadEncounter)

GET /fhir/r4/Encounter?patient={id}&date={date}&status={s}&class={class}&type={type}  
(SearchEncounter)

Parameter	Data Type	Required	Description
{id}	string	Yes*	Encounter ID.



patient	string	Yes	Patient ID filter.
date	string	No	Encounter date filter.
status	string	No	planned   in-progress   finished   cancelled   entered-in-error   unknown.
class	string	No	AMB   IMP   EMER (V3 code).
type	string	No	SNOMED CT or CPT encounter type.



**mustSupport Return Fields (US Core IG v6.1.0):** id, status, class (V3), type (SNOMED CT/CPT), serviceType, subject, participant (type, individual), period, reasonCode, diagnosis, location, serviceProvider.

```
{
  "resourceType": "Encounter",
  "id": "encounter-tronshealth-71299-20240930",
  "meta": {
    "versionId": "2",
    "lastUpdated": "2024-09-30T10:30:00Z",
    "source": "https://api.tronshealth.com/fhir/r4",
    "profile": [
      "http://hl7.org/fhir/us/core/StructureDefinition/us-core-encounter"
    ],
    "security": [
      {
        "system": "http://terminology.hl7.org/CodeSystem/v3-Confidentiality",
        "code": "N",
        "display": "Normal"
      }
    ],
    "tag": [
      {
        "system": "http://terminology.hl7.org/CodeSystem/v3-ActReason",
        "code": "TREAT",
        "display": "Treatment"
      }
    ]
  },
  "text": {
    "status": "generated",
```



```
"div":      "<div      xmlns=\"http://www.w3.org/1999/xhtml\"><p><b>Encounter      —      Martin  
Blue</b></p><p><b>Type: Office Visit — Chronic Disease Management Follow-Up</b></p><p><b>Status:  
Finished</b></p><p><b>Class: Ambulatory (AMB)</b></p><p><b>Date: 2024-09-30 | 09:00 AM — 10:30  
AM</b></p><p><b>Provider: Dr. John A. Doe, MD | NPI: 1245319599</b></p><p><b>Facility: Services Center, Scottsdale  
AZ</b></p><p><b>Reason: Type 2 Diabetes Mellitus, Essential Hypertension Follow-Up</b></p></div>"
```

```
},
```

```
"identifier": [
```

```
{
```

```
  "use": "official",
```

```
  "type": {
```

```
    "coding": [
```

```
      {
```

```
        "system": "http://terminology.hl7.org/CodeSystem/v2-0203",
```

```
        "code": "VN",
```

```
        "display": "Visit Number"
```

```
      }
```

```
    ],
```

```
    "text": "Visit Number"
```

```
  },
```

```
  "system": "https://api.tronshealth.com/fhir/r4/NamingSystem/encounter-id",
```

```
  "value": "TH-ENC-71299-20240930-001",
```

```
  "period": {
```

```
    "start": "2024-09-30T09:00:00Z",
```

```
    "end": "2024-09-30T10:30:00Z"
```

```
  },
```

```
  "assigner": {
```

```
    "reference": "Organization/org-tronshealth-servicesCenter-0001",
```

```
    "display": "Services Center"
```

```
  }
```

```
},
```

```
{
```

```
  "use": "secondary",
```

```
  "type": {
```



```
"coding": [  
  {  
    "system": "http://terminology.hl7.org/CodeSystem/v2-0203",  
    "code": "PLAC",  
    "display": "Placer Identifier"  
  }  
],  
"text": "Appointment Confirmation Number"  
},  
"system": "https://api.tronshealth.com/fhir/r4/NamingSystem/appointment-id",  
"value": "APPT-71299-20240930"  
}  
],
```

```
"status": "finished",
```

```
"statusHistory": [  
  {  
    "status": "planned",  
    "period": {  
      "start": "2024-09-20T08:00:00Z",  
      "end": "2024-09-30T08:55:00Z"  
    }  
  },  
  {  
    "status": "arrived",  
    "period": {  
      "start": "2024-09-30T08:55:00Z",  
      "end": "2024-09-30T09:00:00Z"  
    }  
  },  
  {  
    "status": "in-progress",
```



```
"period": {
  "start": "2024-09-30T09:00:00Z",
  "end": "2024-09-30T10:30:00Z"
},
{
  "status": "finished",
  "period": {
    "start": "2024-09-30T10:30:00Z",
    "end": "2024-09-30T10:30:00Z"
  }
},
],

"class": {
  "system": "http://terminology.hl7.org/CodeSystem/v3-ActCode",
  "code": "AMB",
  "display": "Ambulatory"
},

"classHistory": [
  {
    "class": {
      "system": "http://terminology.hl7.org/CodeSystem/v3-ActCode",
      "code": "AMB",
      "display": "Ambulatory"
    },
    "period": {
      "start": "2024-09-30T09:00:00Z",
      "end": "2024-09-30T10:30:00Z"
    }
  }
],
```



```
"type": [  
  {  
    "coding": [  
      {  
        "system": "http://www.ama-assn.org/go/cpt",  
        "code": "99214",  
        "display": "Office or other outpatient visit, moderate medical decision making"  
      }  
    ],  
    "text": "Office Visit — Moderate Medical Decision Making (Level 4)"  
  },  
  {  
    "coding": [  
      {  
        "system": "http://snomed.info/sct",  
        "code": "185347001",  
        "display": "Encounter for problem (procedure)"  
      }  
    ],  
    "text": "Encounter for Chronic Problem Management"  
  }  
],
```

```
"serviceType": {  
  "coding": [  
    {  
      "system": "http://snomed.info/sct",  
      "code": "394814009",  
      "display": "General practice (qualifier value)"  
    },  
    {  
      "system": "http://nucc.org/provider-taxonomy",
```



```
"code": "207R00000X",
"display": "Internal Medicine Physician"
},
"text": "General Internal Medicine — Ambulatory"
},

"priority": {
  "coding": [
    {
      "system": "http://terminology.hl7.org/CodeSystem/v3-ActPriority",
      "code": "R",
      "display": "Routine"
    }
  ],
  "text": "Routine"
},

"subject": {
  "reference": "Patient/71299",
  "display": "Martin Blue"
},

"episodeOfCare": [
  {
    "reference": "EpisodeOfCare/episodeofcare-tronshealth-71299-diabetes-2024",
    "display": "Diabetes Management Episode of Care — 2024"
  }
],

"basedOn": [
  {
    "reference": "ServiceRequest/servicereq-tronshealth-71299-followup-20240920",
```



```
"display": "Follow-Up Service Request — Diabetes & Hypertension — 2024-09-20"
}
],
```

```
"participant": [
{
  "type": [
    {
      "coding": [
        {
          "system": "http://terminology.hl7.org/CodeSystem/v3-ParticipationType",
          "code": "ATND",
          "display": "Attender"
        }
      ],
      "text": "Attending Physician"
    }
  ],
  "period": {
    "start": "2024-09-30T09:00:00Z",
    "end": "2024-09-30T10:30:00Z"
  },
  "individual": {
    "reference": "Practitioner/practitioner-tronshealth-1245319599",
    "display": "Dr. John A. Doe, MD"
  }
},
{
  "type": [
    {
      "coding": [
        {
          "system": "http://terminology.hl7.org/CodeSystem/v3-ParticipationType",
          "code": "CON",
```



```
      "display": "Consultant"
    }
  ],
  "text": "Consulting Cardiologist"
}
],
"period": {
  "start": "2024-09-30T09:45:00Z",
  "end": "2024-09-30T10:15:00Z"
},
"individual": {
  "reference": "Practitioner/practitioner-tronshealth-9876543210",
  "display": "Dr. Sarah Lee, MD, FACC"
}
},
{
  "type": [
    {
      "coding": [
        {
          "system": "http://terminology.hl7.org/CodeSystem/v3-ParticipationType",
          "code": "PART",
          "display": "Participant"
        }
      ],
      "text": "Registered Nurse — Care Coordinator"
    }
  ],
  "period": {
    "start": "2024-09-30T09:00:00Z",
    "end": "2024-09-30T09:30:00Z"
  },
  "individual": {
    "reference": "Practitioner/practitioner-tronshealth-1122334455",
```



```
"display": "Emily Brown, RN, CCM"
}
}
],

"appointment": [
{
  "reference": "Appointment/appt-tronshealth-71299-20240930",
  "display": "Scheduled Appointment — 2024-09-30"
}
],

"period": {
  "start": "2024-09-30T09:00:00Z",
  "end": "2024-09-30T10:30:00Z"
},

"length": {
  "value": 90,
  "unit": "minutes",
  "system": "http://unitsofmeasure.org",
  "code": "min"
},

"reasonCode": [
{
  "coding": [
    {
      "system": "http://snomed.info/sct",
      "code": "73211009",
      "display": "Diabetes mellitus (disorder)"
    }
  ],
{
```



```
"system": "http://hl7.org/fhir/sid/icd-10-cm",
"code": "E11.9",
"display": "Type 2 diabetes mellitus without complications"
}
],
"text": "Type 2 Diabetes Mellitus — Routine Follow-Up"
},
{
"coding": [
{
"system": "http://snomed.info/sct",
"code": "38341003",
"display": "Hypertensive disorder, systemic arterial (disorder)"
},
{
"system": "http://hl7.org/fhir/sid/icd-10-cm",
"code": "I10",
"display": "Essential (primary) hypertension"
}
],
"text": "Essential Hypertension — Blood Pressure Review"
},
{
"coding": [
{
"system": "http://snomed.info/sct",
"code": "182777000",
"display": "Medication management (procedure)"
}
],
"text": "Medication Reconciliation — Citalopram and Metformin Review"
}
],
```



```
"reasonReference": [  
  {  
    "reference": "Condition/condition-tronshealth-71299-diabetes",  
    "display": "Type 2 Diabetes Mellitus — Active"  
  },  
  {  
    "reference": "Condition/condition-tronshealth-71299-hypertension",  
    "display": "Essential Hypertension — Active"  
  },  
  {  
    "reference": "Condition/condition-tronshealth-71299-anxiety",  
    "display": "Generalized Anxiety Disorder — Active"  
  }  
],  
  
"diagnosis": [  
  {  
    "condition": {  
      "reference": "Condition/condition-tronshealth-71299-diabetes",  
      "display": "Type 2 Diabetes Mellitus"  
    },  
    "use": {  
      "coding": [  
        {  
          "system": "http://terminology.hl7.org/CodeSystem/diagnosis-role",  
          "code": "CC",  
          "display": "Chief Complaint"  
        }  
      ],  
      "text": "Chief Complaint — Primary Diagnosis"  
    },  
    "rank": 1  
  },  
  {
```



```
"condition": {
  "reference": "Condition/condition-tronshealth-71299-hypertension",
  "display": "Essential Hypertension"
},
"use": {
  "coding": [
    {
      "system": "http://terminology.hl7.org/CodeSystem/diagnosis-role",
      "code": "CM",
      "display": "Comorbidity Diagnosis"
    }
  ],
  "text": "Comorbidity — Secondary Diagnosis"
},
"rank": 2
},
{
  "condition": {
    "reference": "Condition/condition-tronshealth-71299-anxiety",
    "display": "Generalized Anxiety Disorder"
  },
  "use": {
    "coding": [
      {
        "system": "http://terminology.hl7.org/CodeSystem/diagnosis-role",
        "code": "CM",
        "display": "Comorbidity Diagnosis"
      }
    ],
    "text": "Comorbidity — Behavioral Health"
  },
  "rank": 3
}
],
```



```
"account": [  
  {  
    "reference": "Account/account-tronshealth-71299-2024",  
    "display": "Patient Billing Account — Martin Blue — 2024"  
  }  
],  
  
"hospitalization": {  
  "preAdmissionIdentifier": {  
    "system": "https://api.tronshealth.com/fhir/r4/NamingSystem/preadmission-id",  
    "value": "PRE-ADM-71299-20240930"  
  },  
  "admitSource": {  
    "coding": [  
      {  
        "system": "http://terminology.hl7.org/CodeSystem/admit-source",  
        "code": "outp",  
        "display": "From outpatient department"  
      }  
    ],  
    "text": "Scheduled Outpatient Appointment"  
  },  
  "dischargeDisposition": {  
    "coding": [  
      {  
        "system": "http://terminology.hl7.org/CodeSystem/discharge-disposition",  
        "code": "home",  
        "display": "Home"  
      }  
    ],  
    "text": "Discharged to Home — No Further Acute Care Required"  
  }  
}
```



```
},
```

```
"location": [
```

```
{
```

```
  "location": {
```

```
    "reference": "Location/location-tronshealth-servicesCenter-exam1",
```

```
    "display": "Services Center — Exam Room 1, Scottsdale AZ"
```

```
  },
```

```
  "status": "completed",
```

```
  "physicalType": {
```

```
    "coding": [
```

```
      {
```

```
        "system": "http://terminology.hl7.org/CodeSystem/location-physical-type",
```

```
        "code": "ro",
```

```
        "display": "Room"
```

```
      }
```

```
    ],
```

```
    "text": "Examination Room"
```

```
  },
```

```
  "period": {
```

```
    "start": "2024-09-30T09:00:00Z",
```

```
    "end": "2024-09-30T10:30:00Z"
```

```
  }
```

```
}
```

```
],
```

```
"serviceProvider": {
```

```
  "reference": "Organization/org-tronshealth-servicesCenter-0001",
```

```
  "display": "Services Center — Scottsdale, AZ"
```

```
},
```

```
"partOf": {
```

```
  "reference": "Encounter/encounter-tronshealth-71299-episodevisit-2024",
```



```
"display": "Diabetes Episode of Care — 2024 Parent Encounter"
},

"extension": [
  {
    "url": "http://hl7.org/fhir/StructureDefinition/encounter-associatedEncounter",
    "valueReference": {
      "reference": "Encounter/encounter-tronshealth-71299-telehealth-20241015",
      "display": "Telehealth Follow-Up — 2024-10-15"
    }
  },
  {
    "url": "http://hl7.org/fhir/us/core/StructureDefinition/us-core-encounter-discharge-status",
    "valueCodeableConcept": {
      "coding": [
        {
          "system": "http://terminology.hl7.org/CodeSystem/discharge-disposition",
          "code": "home",
          "display": "Home"
        }
      ],
      "text": "Patient discharged to home in stable condition"
    }
  },
  {
    "url": "http://hl7.org/fhir/StructureDefinition/workflow-episodeOfCare",
    "valueReference": {
      "reference": "EpisodeOfCare/episodeofcare-tronshealth-71299-diabetes-2024",
      "display": "Diabetes Management Episode of Care — 2024"
    }
  },
  {
    "url": "http://hl7.org/fhir/StructureDefinition/encounter-modeOfArrival",
    "valueCoding": {
```



```
"system": "http://snomed.info/sct",
"code": "185465003",
"display": "Self-referral (finding)"
}
},
{
"url": "http://hl7.org/fhir/StructureDefinition/encounter-reasonCancelled",
"valueCodeableConcept": {
"text": "N/A — Encounter completed as scheduled"
}
}
]
}
```

## 12.18. Provenance

US Core Profile: US Core Provenance Profile | FHIR Resource: Provenance

**Function Names:** ReadProvenance / SearchProvenance

GET /fhir/r4/Provenance/{id} (ReadProvenance)

GET /fhir/r4/Provenance?target={ref}&patient={id}&recorded={date} (SearchProvenance)

Parameter	Data Type	Required	Description
{id}	string	Yes*	Provenance ID.
target	string	No	Reference to target resource.
patient	string	No	Patient ID filter.
recorded	string (dateTime)	No	Timestamp filter. Format: YYYY-MM-DDTHH:MM:SSZ.



**mustSupport Return Fields (US Core IG v6.1.0):** id, target (resource reference), recorded (dateTime), agent (type [author/transmitter], who [Practitioner/Organization], onBehalfOf), entity (role [source/revision], what [resource reference]).

```
{
  "resourceType": "Provenance",
  "id": "provenance-tronshealth-71299-encounter-20240930",
  "meta": {
    "versionId": "2",
    "lastUpdated": "2024-09-30T10:30:00Z",
    "source": "https://api.tronshealth.com/fhir/r4",
    "profile": [
      "http://hl7.org/fhir/us/core/StructureDefinition/us-core-provenance"
    ],
    "security": [
      {
        "system": "http://terminology.hl7.org/CodeSystem/v3-Confidentiality",
        "code": "N",
        "display": "Normal"
      }
    ],
    "tag": [
      {
        "system": "http://terminology.hl7.org/CodeSystem/v3-ActReason",
        "code": "TREAT",
        "display": "Treatment"
      }
    ]
  },
  "text": {
    "status": "generated",
  }
}
```



```
"div": "<div xmlns=\"http://www.w3.org/1999/xhtml\"><p><b>Provenance Record — Martin Blue Encounter 2024-09-30</b></p><p>Target: Encounter, Condition (Diabetes), MedicationRequest (Citalopram), Observation (Blood Pressure), DocumentReference (Progress Note)</p><p>Recorded: 2024-09-30T10:30:00Z</p><p>Author: Dr. John A. Doe, MD | NPI: 1245319599</p><p>Transmitter: TronsHealth FHIR R4 API</p><p>Custodian: Services Center, Scottsdale AZ</p><p>Activity: CREATE — New clinical data recorded during outpatient visit</p></div>"
```

```
},
```

```
"target": [
```

```
{
```

```
  "reference": "Encounter/encounter-tronshealth-71299-20240930",
```

```
  "display": "Outpatient Visit — Martin Blue — 2024-09-30"
```

```
},
```

```
{
```

```
  "reference": "Condition/condition-tronshealth-71299-diabetes",
```

```
  "display": "Type 2 Diabetes Mellitus — Active"
```

```
},
```

```
{
```

```
  "reference": "Condition/condition-tronshealth-71299-hypertension",
```

```
  "display": "Essential Hypertension — Active"
```

```
},
```

```
{
```

```
  "reference": "Condition/condition-tronshealth-71299-anxiety",
```

```
  "display": "Generalized Anxiety Disorder — Active"
```

```
},
```

```
{
```

```
  "reference": "MedicationRequest/medrx-tronshealth-71299-citalopram",
```

```
  "display": "Citalopram 20mg QD — MedicationRequest"
```

```
},
```

```
{
```

```
  "reference": "MedicationRequest/medrx-tronshealth-71299-metformin",
```

```
  "display": "Metformin 500mg BID — MedicationRequest"
```

```
},
```

```
{
```

```
  "reference": "MedicationRequest/medrx-tronshealth-71299-lisinopril",
```



```
"display": "Lisinopril 10mg QD — MedicationRequest"
},
{
  "reference": "Observation/obs-tronshealth-71299-bloodpressure-20240930",
  "display": "Blood Pressure Observation — 2024-09-30"
},
{
  "reference": "Observation/obs-tronshealth-71299-bodyweight-20240930",
  "display": "Body Weight Observation — 2024-09-30"
},
{
  "reference": "Observation/obs-tronshealth-71299-heartrate-20240930",
  "display": "Heart Rate Observation — 2024-09-30"
},
{
  "reference": "DocumentReference/docref-tronshealth-71299-progressnote-20240930",
  "display": "Progress Note — Martin Blue — 2024-09-30"
},
{
  "reference": "CarePlan/careplan-tronshealth-71299-diabetes-2024",
  "display": "Diabetes Chronic Disease Management Care Plan — 2024"
},
{
  "reference": "CareTeam/careteam-tronshealth-patient-71299",
  "display": "Martin Blue — Primary Care Team"
}
],

"occurred": {
  "occurredPeriod": {
    "start": "2024-09-30T09:00:00Z",
    "end": "2024-09-30T10:30:00Z"
  }
},
```



```
"recorded": "2024-09-30T10:30:00Z",
```

```
"policy": [  
  "https://api.tronshealth.com/fhir/r4/policy/data-access-policy-v2",  
  "https://api.tronshealth.com/fhir/r4/policy/hipaa-privacy-policy",  
  "https://www.healthit.gov/curesrule/",  
  "https://ecfr.gov/current/title-45/subtitle-A/subchapter-D/part-170/subpart-D/section-170.404"  
],
```

```
"location": {  
  "reference": "Location/location-tronshealth-servicesCenter-exam1",  
  "display": "Services Center — Exam Room 1, Scottsdale AZ"  
},
```

```
"reason": [  
  {  
    "system": "http://terminology.hl7.org/CodeSystem/v3-ActReason",  
    "code": "TREAT",  
    "display": "Treatment"  
  },  
  {  
    "system": "http://terminology.hl7.org/CodeSystem/v3-ActReason",  
    "code": "HOPERAT",  
    "display": "Healthcare Operations"  
  }  
],
```

```
"activity": {  
  "coding": [  
    {  
      "system": "http://terminology.hl7.org/CodeSystem/v3-DataOperation",  
      "code": "CREATE",
```



```
"display": "Create"
},
{
  "system": "http://terminology.hl7.org/CodeSystem/iso-21089-lifecycle",
  "code": "originate",
  "display": "Originate/Retain Record Lifecycle Event"
}
],
"text": "New clinical data created and retained during outpatient visit — 2024-09-30"
},

"agent": [
  {
    "type": {
      "coding": [
        {
          "system": "http://terminology.hl7.org/CodeSystem/provenance-participant-type",
          "code": "author",
          "display": "Author"
        }
      ],
      "text": "Author — Attending Physician"
    },
    "role": [
      {
        "coding": [
          {
            "system": "http://terminology.hl7.org/CodeSystem/v3-RoleClass",
            "code": "PROV",
            "display": "Healthcare Provider"
          }
        ],
        "text": "Primary Care Physician — Internal Medicine"
      }
    ]
  }
]
```



```
],
"who": {
  "reference": "Practitioner/practitioner-tronshealth-1245319599",
  "display": "Dr. John A. Doe, MD | NPI: 1245319599"
},
"onBehalfOf": {
  "reference": "Organization/org-tronshealth-servicesCenter-0001",
  "display": "Services Center — Scottsdale, AZ"
}
},
{
  "type": {
    "coding": [
      {
        "system": "http://terminology.hl7.org/CodeSystem/provenance-participant-type",
        "code": "transmitter",
        "display": "Transmitter"
      }
    ],
    "text": "Transmitter — FHIR API System"
  },
  "role": [
    {
      "coding": [
        {
          "system": "http://terminology.hl7.org/CodeSystem/v3-RoleClass",
          "code": "ASSIGNED",
          "display": "Assigned Entity"
        }
      ],
      "text": "TronsHealth FHIR R4 API Transmitter"
    }
  ],
  "who": {
```



```
"reference": "Organization/org-tronshealth-servicesCenter-0001",
"display": "TronsHealth FHIR R4 API — Services Center"
}
},
{
  "type": {
    "coding": [
      {
        "system": "http://terminology.hl7.org/CodeSystem/provenance-participant-type",
        "code": "verifier",
        "display": "Verifier"
      }
    ],
    "text": "Verifier — Consulting Cardiologist"
  },
  "role": [
    {
      "coding": [
        {
          "system": "http://terminology.hl7.org/CodeSystem/v3-RoleClass",
          "code": "PROV",
          "display": "Healthcare Provider"
        }
      ],
      "text": "Cardiologist — Cardiovascular Disease"
    }
  ],
  "who": {
    "reference": "Practitioner/practitioner-tronshealth-9876543210",
    "display": "Dr. Sarah Lee, MD, FACC | NPI: 9876543210"
  },
  "onBehalfOf": {
    "reference": "Organization/org-tronshealth-servicesCenter-0001",
    "display": "Services Center — Scottsdale, AZ"
  }
}
```



```
}
},
{
  "type": {
    "coding": [
      {
        "system": "http://terminology.hl7.org/CodeSystem/provenance-participant-type",
        "code": "informant",
        "display": "Informant"
      }
    ],
    "text": "Informant — Registered Nurse Care Coordinator"
  },
  "role": [
    {
      "coding": [
        {
          "system": "http://terminology.hl7.org/CodeSystem/v3-RoleClass",
          "code": "PROV",
          "display": "Healthcare Provider"
        }
      ],
      "text": "Registered Nurse — Care Coordinator"
    }
  ],
  "who": {
    "reference": "Practitioner/practitioner-tronshealth-1122334455",
    "display": "Emily Brown, RN, CCM"
  },
  "onBehalfOf": {
    "reference": "Organization/org-tronshealth-servicesCenter-0001",
    "display": "Services Center — Scottsdale, AZ"
  }
},
}
```



```
{
  "type": {
    "coding": [
      {
        "system": "http://terminology.hl7.org/CodeSystem/provenance-participant-type",
        "code": "custodian",
        "display": "Custodian"
      }
    ],
    "text": "Custodian — Managing Organization"
  },
  "role": [
    {
      "coding": [
        {
          "system": "http://terminology.hl7.org/CodeSystem/v3-RoleClass",
          "code": "AGNT",
          "display": "Agent"
        }
      ],
      "text": "Data Custodian Organization"
    }
  ],
  "who": {
    "reference": "Organization/org-tronshealth-servicesCenter-0001",
    "display": "Services Center — Scottsdale, AZ | NPI: 1669498739"
  }
},
{
  "type": {
    "coding": [
      {
        "system": "http://terminology.hl7.org/CodeSystem/provenance-participant-type",
        "code": "performer",
```



```
    "display": "Performer"
  }
],
"text": "Performer — Clinical Pharmacist"
},
"role": [
  {
    "coding": [
      {
        "system": "http://terminology.hl7.org/CodeSystem/v3-RoleClass",
        "code": "PROV",
        "display": "Healthcare Provider"
      }
    ],
    "text": "Clinical Pharmacist — Medication Management"
  }
],
"who": {
  "reference": "Practitioner/practitioner-tronshealth-9988776655",
  "display": "Dr. Aisha Patel, PharmD, BCPS"
},
"onBehalfOf": {
  "reference": "Organization/org-tronshealth-servicesCenter-0001",
  "display": "Services Center — Scottsdale, AZ"
}
}
],
"entity": [
  {
    "role": "source",
    "what": {
      "reference": "Encounter/encounter-tronshealth-71299-20240930",
      "display": "Source Encounter — Outpatient Visit 2024-09-30"
    }
  }
]
```



```
}
},
{
  "role": "revision",
  "what": {
    "reference": "Condition/condition-tronshealth-71299-diabetes",
    "display": "Revised Condition — Type 2 Diabetes Mellitus (Updated HbA1c 7.2%)"
  }
},
{
  "role": "revision",
  "what": {
    "reference": "MedicationRequest/medrx-tronshealth-71299-citalopram",
    "display": "Revised MedicationRequest — Citalopram 20mg QD (Dose Reviewed)"
  }
},
{
  "role": "quotation",
  "what": {
    "reference": "DocumentReference/docref-tronshealth-71299-progressnote-20240815",
    "display": "Quoted Source — Previous Progress Note 2024-08-15"
  }
},
{
  "role": "source",
  "what": {
    "reference": "Patient/71299",
    "display": "Patient — Martin Blue (Self-Reported History)"
  }
},
{
  "role": "source",
  "what": {
    "identifier": {
```



```
"type": {
  "coding": [
    {
      "system": "http://terminology.hl7.org/CodeSystem/v2-0203",
      "code": "NPI",
      "display": "National Provider Identifier"
    }
  ]
},
"system": "http://hl7.org/fhir/sid/us-npi",
"value": "1245319599"
},
"display": "EHR System — TronsHealth Clinical Data Source"
}
},
{
  "role": "derivation",
  "what": {
    "reference": "Observation/obs-tronshealth-71299-bloodpressure-20240930",
    "display": "Derived Observation — Blood Pressure 128/82 mmHg (Recorded during encounter)"
  }
},
{
  "role": "derivation",
  "what": {
    "reference": "CarePlan/careplan-tronshealth-71299-diabetes-2024",
    "display": "Derived CarePlan — Diabetes Management Plan updated from encounter findings"
  }
}
],

"signature": [
  {
    "type": [
```



```
{
  "system": "urn:iso-astm:E1762-95:2013",
  "code": "1.2.840.10065.1.12.1.1",
  "display": "Author's Signature"
},
"when": "2024-09-30T10:30:00Z",
"who": {
  "reference": "Practitioner/practitioner-tronshealth-1245319599",
  "display": "Dr. John A. Doe, MD"
},
"onBehalfOf": {
  "reference": "Organization/org-tronshealth-servicesCenter-0001",
  "display": "Services Center"
},
"targetFormat": "application/fhir+json",
"sigFormat": "application/jose",
"data":
"ZXIKaGJHY2IPaUpTVXpJMU5pSXNJbll1Y0NJNkRcFhWQ0o5LmV5SnBjM01pT2IKb2RIUndjem92TDJG
d2NDDeDBjbTl1YzJSb1lYz3VZMjI0TDJacGFHOHZjall2SW4wLlVZVERiazFpVlhS TFZtcFVWbEpLVW1wVI
ZsSkxWbXBVmxKS1VtcFVWbEpM"
},
{
  "type": [
    {
      "system": "urn:iso-astm:E1762-95:2013",
      "code": "1.2.840.10065.1.12.1.5",
      "display": "Verification Signature"
    }
  ],
"when": "2024-09-30T10:45:00Z",
"who": {
  "reference": "Practitioner/practitioner-tronshealth-9876543210",
  "display": "Dr. Sarah Lee, MD, FACC"
}
```



```
},
"onBehalfOf": {
  "reference": "Organization/org-tronshealth-servicesCenter-0001",
  "display": "Services Center"
},
"targetFormat": "application/fhir+json",
"sigFormat": "application/jose",
"data":
"ZXIKaGJHY2IPaUpTVXpJMU5pSXNJbII1Y0NJNklrcFhWQ0o5LmV5S nBjM01p T2IKa2IzZGxjaTVoY0hB
dWRHOXJaVzR1WTI5dEluMC5WZXJpZmljYXRpb25TaWduYXR1cmVEYXRh"
}
],
```

```
"extension": [
{
  "url": "http://hl7.org/fhir/StructureDefinition/provenance-relevant-history",
  "valueReference": {
    "reference": "Provenance/provenance-tronshealth-71299-encounter-20240815",
    "display": "Previous Provenance Record — Encounter 2024-08-15"
  }
},
{
  "url": "http://hl7.org/fhir/us/core/StructureDefinition/us-core-provenance-author-organization",
  "valueReference": {
    "reference": "Organization/org-tronshealth-servicesCenter-0001",
    "display": "Services Center — Author Organization"
  }
},
{
  "url": "http://hl7.org/fhir/StructureDefinition/workflow-episodeOfCare",
  "valueReference": {
    "reference": "EpisodeOfCare/episodeofcare-tronshealth-71299-diabetes-2024",
    "display": "Diabetes Management Episode of Care — 2024"
  }
}
```



```
},
{
  "url": "http://hl7.org/fhir/StructureDefinition/provenance-system-version",
  "valueString": "TronsHealth EHR v4.2.1 — FHIR R4 API v2.0 — US Core IG v6.1.0"
},
{
  "url": "http://hl7.org/fhir/StructureDefinition/provenance-transmission-method",
  "valueCoding": {
    "system": "http://terminology.hl7.org/CodeSystem/v3-ObservationMethod",
    "code": "ELECTRONIC",
    "display": "Electronic Transmission — FHIR R4 REST API over TLS 1.3"
  }
},
{
  "url": "http://hl7.org/fhir/StructureDefinition/provenance-data-sensitivity",
  "valueCodeableConcept": {
    "coding": [
      {
        "system": "http://terminology.hl7.org/CodeSystem/v3-ActCode",
        "code": "MENCAT",
        "display": "Mental Health Information"
      },
      {
        "system": "http://terminology.hl7.org/CodeSystem/v3-ActCode",
        "code": "DIABCAT",
        "display": "Diabetes Information"
      }
    ],
    "text": "Contains Mental Health and Diabetes data — HTI-1 Data Segmentation for Privacy"
  }
}
]
```