



# MDFlow EHR

## Master API Documentation

FHIR R4 / SMART on FHIR / Basic API/ Third-Party Integration

Document Field	Value
Product	MDFlow EHR and Patient Care Workflow Management System
Document Type	Master API Reference for Third-Party Integrations
FHIR Version	FHIR R4 with US Core profile alignment where applicable
Authentication	SMART on FHIR OAuth 2.0 / OIDC; client credentials for backend services
API Mode	Read-focused patient clinical data APIs; write operations only where explicitly contracted
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# 1. INTRODUCTION

This document describes the MDFlow EHR API surface for approved third-party systems, mobile applications, patient-facing applications, provider applications, and backend service integrations. MDFlow exposes clinical, demographic, administrative, and document data primarily through HL7 FHIR REST APIs and SMART on FHIR authorization patterns.

The document combines supported FHIR resources, OAuth/SMART launch steps, common request patterns, security rules, error handling, non-FHIR convenience APIs, and third-party integration interfaces such as CareQuality, and DrFirst eRx.

## 1.1 Audience and Scope

- Third-party application developers integrating with MDFlow EHR
- Implementation and interface teams configuring API access
- Security reviewers validating OAuth scopes, audit, and consent handling
- QA teams validating FHIR resource responses and clinical data exchange

## 1.2 Important Implementation Notes

- All production access requires client registration, signed agreement, approved scopes, and HTTPS/TLS.
- FHIR API examples use placeholders such as {baseUrl}, {patientId}, {encounterId}, and {accessToken}.
- Only minimum necessary scopes should be requested. MDFlow may restrict fields or resources based on user, patient, consent, organization, or contractual permissions.
- Unless explicitly enabled in an implementation contract, FHIR resource APIs are read-only.

# 2. BASE URLS AND DISCOVERY

Environment	FHIR Base URL	Authorization Server	Notes
Production	https://api.mdflow.com/fhir/r4	https://auth.mdflow.com	Final URL to be provided during onboarding
Sandbox/Test	https://sandbox-api.mdflow.com/fhir/r4	https://sandbox-auth.mdflow.com	Used for development, validation, and certification testing
Customer-hosted	https://{customer-domain}/fhir/r4	https://{customer-domain}/oauth2	Used where MDFlow is deployed under customer infrastructure

Endpoint	Method	Purpose
{baseUrl}/metadata	GET	FHIR CapabilityStatement
{baseUrl}/.well-known/smart-configuration	GET	SMART authorization metadata
{authUrl}/authorize	GET	Authorization code request
{authUrl}/token	POST	Token request / refresh token request / backend service token
{authUrl}/revoke	POST	Token revocation, if enabled

GET {baseUrl}/.well-known/smart-configuration  
 Accept: application/json

```
{
  "authorization_endpoint": "https://auth.mdflow.com/authorize",
  "token_endpoint": "https://auth.mdflow.com/token",
  "capabilities": ["launch-ehr", "launch-standalone", "client-confidential-symmetric", "client-confidential-asymmetric", "sso-openid-connect"]
}
```

### 3. AUTHENTICATION AND AUTHORIZATION

MDFlow supports SMART on FHIR compatible OAuth 2.0 flows for interactive and backend applications. OAuth scopes determine which FHIR resources and patient contexts a client can access.

Application Type	Typical Flow	Authentication	Use Case
Standalone SMART app	Authorization Code + PKCE	Public or confidential client	Patient or provider opens an app outside the EHR
EHR embedded SMART app	EHR Launch + Authorization Code	Public or confidential client	App launched from MDFlow with patient/encounter context
Backend service app	Client Credentials with private_key_jwt	Asymmetric client authentication	System-to-system export, analytics, integration engine
Server-side confidential app	Authorization Code	Client secret or private_key_jwt	Trusted web application with secure backend

#### 3.1 Client Registration

- Application name and vendor contact details
- Redirect URI list and launch URL, where applicable
- Requested FHIR resources and scopes
- JWKS URL for asymmetric authentication
- Environment required: sandbox, production, or customer-hosted
- Security contact, privacy contact, and support escalation details

#### 3.2 Common Scopes

Scope	Meaning
launch	Request EHR launch context
launch/patient	Request patient selection during standalone launch
openid fhirUser	Request identity token and FHIR user reference
offline_access	Request refresh token where approved
patient/*.read	Read resources for the selected patient
patient/Observation.read	Read Observation resources for selected patient
user/*.read	Read resources available to the authenticated user
system/*.read	Backend service read access after administrative approval

#### 3.3 Authorization Code Request

```
GET {authUrl}/authorize?response_type=code&client_id={clientId}&redirect_uri={redirectUri}&scope=launch/patient
openid fhirUser offline_access patient/Patient.read patient/Observation.read&state={opaqueState}&aud={baseUrl}
```

#### 3.4 Token Request

```
POST {authUrl}/token
Content-Type: application/x-www-form-urlencoded
```

```
grant_type=authorization_code&code={authorizationCode}&redirect_uri={redirectUri}&client_id={clientId}
```

```
HTTP/1.1 200 OK
{
  "access_token": "eyJ...",
  "token_type": "Bearer",
  "expires_in": 3600,
  "scope": "launch/patient openid fhirUser patient/*.read",
  "patient": "12345",
  "refresh_token": "def502..."
}
```

## 4. GENERAL API RULES

Item	MDFlow Rule
Transport	HTTPS only. TLS 1.2 or higher recommended; TLS 1.3 preferred where available.
FHIR format	JSON responses are default. XML may be enabled only where contracted.
Authorization header	Authorization: Bearer {accessToken}
Content negotiation	Accept: application/fhir+json or application/json
Pagination	Use _count and next links from Bundle.link.
Dates	FHIR date/datetime formats are used. Search prefixes such as ge, le, gt, lt may be supported for date searches.
Sorting	Use _sort where enabled, for example _sort=-date.
Includes	_include and _revinclude are implementation-dependent and may be limited for performance.
Audit	Every API access is audited by client, user/system, patient, resource, timestamp, IP, and outcome.

## 5. BASIC NON-FHIR APIS

These APIs are optional convenience endpoints for integration partners that require a simple REST interface in addition to standards-based FHIR APIs. Where possible, third parties should use FHIR endpoints first.

#	API	Method / Endpoint	Purpose
1	Authenticate / Login	POST /api/v1/auth/login	Validate registered client or user credentials according to the contracted flow.
2	Generate Token	POST /api/v1/auth/token	Generate JWT/OAuth access token for basic API calls.
3	Search Patient	GET /api/v1/patients/search?fname={fname}&lname={lname}&dob={yyyy-mm-dd}&sex={sex}	Search patient by first name, last name, DOB, and sex; returns one or more matching patients.
4	Get Encounters	GET /api/v1/patients/{patientId}/encounters	Return encounters for the patient.
5	Get Document / CCDA	GET /api/v1/patients/{patientId}/documents/ccda	Return C-CDA file or link for a patient, subject to authorization and consent.

```
GET /api/v1/patients/search?fname=John&lname=Smith&dob=1980-04-05&sex=M
Authorization: Bearer {accessToken}
```

```
{
  "total": 1,
  "patients": [{"patientId": "12345", "mrn": "MRN1001", "firstName": "John", "lastName": "Smith", "dob": "1980-04-05",
    "sex": "M"}]}
}
```

## 6. SUPPORTED FHIR RESOURCES AND PROFILES

The following table summarizes the FHIR resources, profiles, and related clinical domains supported by MDFlow. Profile URLs are included for implementation alignment and validation reference.

FHIR Resource / Profile	MDFlow Use	Typical Search	Profile / Reference URL
Coverage	Patient Insurance Coverage	Coverage?patient={patientId}	<a href="https://hl7.org/fhir/us/core/STU6.1/StructureDefinition-us-core-coverage.html">https://hl7.org/fhir/us/core/STU6.1/StructureDefinition-us-core-coverage.html</a>
DiagnosticReport (Laboratory Results Reporting)	-	DiagnosticReport?patient={patientId}&category=LAB	<a href="https://hl7.org/fhir/us/core/STU6.1/StructureDefinition-us-core-diagnosticreport-lab.html">https://hl7.org/fhir/us/core/STU6.1/StructureDefinition-us-core-diagnosticreport-lab.html</a>
DiagnosticReport (Report and Note exchange)	-	DiagnosticReport?patient={patientId}	<a href="https://hl7.org/fhir/us/core/STU6.1/StructureDefinition-us-core-diagnosticreport-note.html">https://hl7.org/fhir/us/core/STU6.1/StructureDefinition-us-core-diagnosticreport-note.html</a>
DocumentReference (C-CDAs)	-	DocumentReference?patient={patientId}&type=34133-9	<a href="https://hl7.org/fhir/us/core/STU6.1/StructureDefinition-us-core-documentreference.html">https://hl7.org/fhir/us/core/STU6.1/StructureDefinition-us-core-documentreference.html</a>
DocumentReference (Clinical Notes)	Consultation Note (11488-4)	DocumentReference?patient={patientId}	<a href="https://hl7.org/fhir/us/core/STU6.1/clinical-notes.html">https://hl7.org/fhir/us/core/STU6.1/clinical-notes.html</a>
Encounter	-	Encounter?patient={patientId}	<a href="https://hl7.org/fhir/us/core/STU6.1/StructureDefinition-us-core-encounter.html">https://hl7.org/fhir/us/core/STU6.1/StructureDefinition-us-core-encounter.html</a>
Family Member History	-	FamilyMemberHistory?patient={patientId}	<a href="https://hl7.org/fhir/familymemberhistory.html">https://hl7.org/fhir/familymemberhistory.html</a>
Goal - SDOH	-	Goal?patient={patientId}&category=sdoh	-

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Goal	-	Goal?patient={patientId}	<a href="https://hl7.org/fhir/us/core/STU6.1/StructureDefinition-us-core-goal.html">https://hl7.org/fhir/us/core/STU6.1/StructureDefinition-us-core-goal.html</a>
Immunization	-	Immunization?patient={patientId}	<a href="https://hl7.org/fhir/us/core/STU6.1/StructureDefinition-us-core-immunization.html">https://hl7.org/fhir/us/core/STU6.1/StructureDefinition-us-core-immunization.html</a>
Implants	-	Device?patient={patientId}	<a href="https://hl7.org/fhir/us/core/STU6.1/StructureDefinition-us-core-implantable-device.html">https://hl7.org/fhir/us/core/STU6.1/StructureDefinition-us-core-implantable-device.html</a>
Location	-	Location/{id}	<a href="https://hl7.org/fhir/us/core/STU6.1/StructureDefinition-us-core-location.html">https://hl7.org/fhir/us/core/STU6.1/StructureDefinition-us-core-location.html</a>
Media	-	Media?patient={patientId}	<a href="https://hl7.org/fhir/R4/media.html">https://hl7.org/fhir/R4/media.html</a>
Medication	Active Medications	MedicationRequest?patient={patientId}	<a href="https://hl7.org/fhir/us/core/STU6.1/StructureDefinition-us-core-medication.html">https://hl7.org/fhir/us/core/STU6.1/StructureDefinition-us-core-medication.html</a>
MedicationAdministration (Medications)	Medications administered during visit	MedicationAdministration?patient={patientId}	<a href="http://hl7.org/fhir/R4/medicationadministration.html">http://hl7.org/fhir/R4/medicationadministration.html</a>
MedicationRequest	Medication request	MedicationRequest?patient={patientId}	<a href="https://hl7.org/fhir/us/core/STU6.1/StructureDefinition-us-core-observation-clinical-result.html">https://hl7.org/fhir/us/core/STU6.1/StructureDefinition-us-core-observation-clinical-result.html</a>
Observation (Labs)	Based on LOINC Code, Dates, Category=Laboratory	Observation?patient={patientId}&category=laboratory	<a href="https://hl7.org/fhir/us/core/STU6.1/StructureDefinition-us-core-observation-lab.html">https://hl7.org/fhir/us/core/STU6.1/StructureDefinition-us-core-observation-lab.html</a>
Observation (Occupation)	-	Observation?patient={patientId}&code=http://loinc.org 11341-5	<a href="https://hl7.org/fhir/us/core/STU6.1/StructureDefinition-us-core-observation-occupation.html">https://hl7.org/fhir/us/core/STU6.1/StructureDefinition-us-core-observation-occupation.html</a>
Observation (Screening Assessment)	-	Observation?patient={patientId}&category=survey	<a href="https://hl7.org/fhir/us/core/STU6.1/StructureDefinition-us-core-observation-screening-assessment.html">https://hl7.org/fhir/us/core/STU6.1/StructureDefinition-us-core-observation-screening-assessment.html</a>
Observation (SDOH)	-	Observation?patient={patientId}&category=sdoh	<a href="https://hl7.org/fhir/us/core/STU6.1/StructureDefinition-us-core-observation-screening-assessment.html">https://hl7.org/fhir/us/core/STU6.1/StructureDefinition-us-core-observation-screening-assessment.html</a>
Observation (Simple Observation)	Based on LOINC Code	Observation?patient={patientId}&code={system code}	<a href="https://hl7.org/fhir/us/core/STU6.1/StructureDefinition-us-core-simple-observation.html">https://hl7.org/fhir/us/core/STU6.1/StructureDefinition-us-core-simple-observation.html</a>
Observation (Functional Status)	-	Observation?patient={patientId}&category=functional-status	<a href="https://hl7.org/fhir/observation.html">https://hl7.org/fhir/observation.html</a>
Observation (Cognitive Status)	-	Observation?patient={patientId}&category=cognitive-status	<a href="https://hl7.org/fhir/observation.html">https://hl7.org/fhir/observation.html</a>
Observation (Disability Status)	-	Observation?patient={patientId}&category=disability-status	<a href="https://hl7.org/fhir/observation.html">https://hl7.org/fhir/observation.html</a>
Observation (Smoking Status)	-	Observation?patient={patientId}&code=http://loinc.org 72166-2	<a href="https://hl7.org/fhir/us/core/STU6.1/StructureDefinition-us-core-smokingstatus.html">https://hl7.org/fhir/us/core/STU6.1/StructureDefinition-us-core-smokingstatus.html</a>
Observation (Vitals)	-	Observation?patient={patientId}&category=vital-signs	<a href="https://hl7.org/fhir/us/core/STU6.1/StructureDefinition-us-core-vital-signs.html">https://hl7.org/fhir/us/core/STU6.1/StructureDefinition-us-core-vital-signs.html</a>
bmi	-	Observation?patient={patientId}&code=http://loinc.org 39156-5	<a href="https://hl7.org/fhir/us/core/STU6.1/StructureDefinition-us-core-bmi.html">https://hl7.org/fhir/us/core/STU6.1/StructureDefinition-us-core-bmi.html</a>
body-height	-	Observation?patient={patientId}&code=http://loinc.org 8302-2	<a href="https://hl7.org/fhir/us/core/STU6.1/StructureDefinition-us-core-body-height.html">https://hl7.org/fhir/us/core/STU6.1/StructureDefinition-us-core-body-height.html</a>
body-temperature	-	Observation?patient={patientId}&code=http://loinc.org 8310-5	<a href="https://hl7.org/fhir/us/core/STU6.1/StructureDefinition-us-core-body-temperature.html">https://hl7.org/fhir/us/core/STU6.1/StructureDefinition-us-core-body-temperature.html</a>
body-weight	-	Observation?patient={patientId}&code=http://loinc.org 29463-7	<a href="https://hl7.org/fhir/us/core/STU6.1/StructureDefinition-us-core-body-weight.html">https://hl7.org/fhir/us/core/STU6.1/StructureDefinition-us-core-body-weight.html</a>
blood-pressure	-	Observation?patient={patientId}&code=http://loinc.org 85354-9	<a href="https://hl7.org/fhir/us/core/STU6.1/StructureDefinition-us-core-blood-pressure.html">https://hl7.org/fhir/us/core/STU6.1/StructureDefinition-us-core-blood-pressure.html</a>
head-circumference	-	Observation?patient={patientId}&code=http://loinc.org 9843-4	<a href="https://hl7.org/fhir/us/core/STU6.1/StructureDefinition-us-core-head-circumference.html">https://hl7.org/fhir/us/core/STU6.1/StructureDefinition-us-core-head-circumference.html</a>
head-occipital-frontal-circumference-percentile	-	See resource-specific search parameters	<a href="https://hl7.org/fhir/us/core/STU6.1/StructureDefinition-head-occipital-frontal-circumference-percentile.html">https://hl7.org/fhir/us/core/STU6.1/StructureDefinition-head-occipital-frontal-circumference-percentile.html</a>
heart-rate	-	Observation?patient={patientId}&code=http://loinc.org 8867-4	<a href="https://hl7.org/fhir/us/core/STU6.1/StructureDefinition-us-core-heart-rate.html">https://hl7.org/fhir/us/core/STU6.1/StructureDefinition-us-core-heart-rate.html</a>
pediatric-bmi-for-age	-	See resource-specific search parameters	<a href="https://hl7.org/fhir/us/core/STU6.1/StructureDefinition-pediatric-bmi-for-age.html">https://hl7.org/fhir/us/core/STU6.1/StructureDefinition-pediatric-bmi-for-age.html</a>
pediatric-weight-for-height	-	See resource-specific search parameters	<a href="https://hl7.org/fhir/us/core/STU6.1/StructureDefinition-pediatric-weight-for-height.html">https://hl7.org/fhir/us/core/STU6.1/StructureDefinition-pediatric-weight-for-height.html</a>
pulse-oximetry	-	Observation?patient={patientId}&code=http://loinc.org 59408-5	<a href="https://hl7.org/fhir/us/core/STU6.1/StructureDefinition-us-core-pulse-oximetry.html">https://hl7.org/fhir/us/core/STU6.1/StructureDefinition-us-core-pulse-oximetry.html</a>
respiratory-rate	-	Observation?patient={patientId}&code=http://loinc.org 9279-1	<a href="https://hl7.org/fhir/us/core/STU6.1/StructureDefinition-us-core-respiratory-rate.html">https://hl7.org/fhir/us/core/STU6.1/StructureDefinition-us-core-respiratory-rate.html</a>
Organization (EMR)	-	Organization/{id}	<a href="https://hl7.org/fhir/us/core/STU6.1/StructureDefinition-us-core-organization.html">https://hl7.org/fhir/us/core/STU6.1/StructureDefinition-us-core-organization.html</a>
Patient	-	Patient?identifier={mrn} OR Patient?name={name}&birthdate={yyyy-mm-dd}&gender={gender}	<a href="https://hl7.org/fhir/us/core/STU6.1/StructureDefinition-us-core-patient.html">https://hl7.org/fhir/us/core/STU6.1/StructureDefinition-us-core-patient.html</a>
Birth Sex Extension	-	See resource-specific search parameters	<a href="https://hl7.org/fhir/us/core/STU6.1/StructureDefinition-us-core-birthsex.html">https://hl7.org/fhir/us/core/STU6.1/StructureDefinition-us-core-birthsex.html</a>
Sex Extension	-	See resource-specific search parameters	<a href="https://hl7.org/fhir/us/core/STU6.1/StructureDefinition-us-core-sex.html">https://hl7.org/fhir/us/core/STU6.1/StructureDefinition-us-core-sex.html</a>
Ethnicity Extension	-	See resource-specific search parameters	<a href="https://hl7.org/fhir/us/core/STU6.1/StructureDefinition-us-core-ethnicity.html">https://hl7.org/fhir/us/core/STU6.1/StructureDefinition-us-core-ethnicity.html</a>
Gender Identity Extension	-	See resource-specific search parameters	<a href="https://hl7.org/fhir/us/core/STU6.1/StructureDefinition-us-core-genderidentity.html">https://hl7.org/fhir/us/core/STU6.1/StructureDefinition-us-core-genderidentity.html</a>

Observation (Sexual orientation)	-	See resource-specific search parameters	<a href="https://hl7.org/fhir/us/core/STU6.1/StructureDefinition-us-core-observation-sexual-orientation.html">https://hl7.org/fhir/us/core/STU6.1/StructureDefinition-us-core-observation-sexual-orientation.html</a>
Race Extension	-	See resource-specific search parameters	<a href="https://hl7.org/fhir/us/core/STU6.1/StructureDefinition-us-core-race.html">https://hl7.org/fhir/us/core/STU6.1/StructureDefinition-us-core-race.html</a>
RelatedPerson	-	RelatedPerson?patient={patientId}	<a href="https://hl7.org/fhir/us/core/STU6.1/StructureDefinition-us-core-relatedperson.html">https://hl7.org/fhir/us/core/STU6.1/StructureDefinition-us-core-relatedperson.html</a>
Tribal Affiliation Extension	-	See resource-specific search parameters	<a href="https://hl7.org/fhir/us/core/STU6.1/StructureDefinition-us-core-tribal-affiliation.html">https://hl7.org/fhir/us/core/STU6.1/StructureDefinition-us-core-tribal-affiliation.html</a>
Practitioner Role	-	PractitionerRole?practitioner={id}	<a href="https://hl7.org/fhir/us/core/STU6.1/StructureDefinition-us-core-practitionerrole.html">https://hl7.org/fhir/us/core/STU6.1/StructureDefinition-us-core-practitionerrole.html</a>
Practitioner	-	Practitioner/{id}	<a href="https://hl7.org/fhir/us/core/STU6.1/StructureDefinition-us-core-practitioner.html">https://hl7.org/fhir/us/core/STU6.1/StructureDefinition-us-core-practitioner.html</a>
Procedure (Orders)	-	Procedure?patient={patientId}	<a href="https://hl7.org/fhir/us/core/STU6.1/StructureDefinition-us-core-procedure.html">https://hl7.org/fhir/us/core/STU6.1/StructureDefinition-us-core-procedure.html</a>
Provenance	-	Provenance?target={resourceType}/{id}	<a href="https://hl7.org/fhir/us/core/STU6.1/StructureDefinition-us-core-provenance.html">https://hl7.org/fhir/us/core/STU6.1/StructureDefinition-us-core-provenance.html</a>
ServiceRequest (Lab, DI & Procedure Orders)	-	ServiceRequest?patient={patientId}&category={lab imaging procedure}	<a href="https://hl7.org/fhir/us/core/STU6.1/StructureDefinition-us-core-servicerequest.html">https://hl7.org/fhir/us/core/STU6.1/StructureDefinition-us-core-servicerequest.html</a>
ServiceRequest (Referrals)	-	ServiceRequest?patient={patientId}&category=referral	<a href="https://hl7.org/fhir/us/core/STU6.1/StructureDefinition-us-core-servicerequest.html">https://hl7.org/fhir/us/core/STU6.1/StructureDefinition-us-core-servicerequest.html</a>
ServiceRequest (SDOH Interventions)	-	ServiceRequest?patient={patientId}&category=sdoh	<a href="https://hl7.org/fhir/us/core/STU6.1/StructureDefinition-us-core-servicerequest.html">https://hl7.org/fhir/us/core/STU6.1/StructureDefinition-us-core-servicerequest.html</a>

## 7. RESOURCE API REFERENCE

### 7.1 Patient

Field	Details
Purpose	Patient demographics and identifiers
Search Pattern	Patient/{id}; Patient?identifier={system value}; Patient?name={name}&birthdate={date}&gender={gender}
Required Scope	patient/Patient.read
Response	FHIR Bundle for searches; FHIR resource for read by id.
Notes	US Core Patient profile including race, ethnicity, birth sex, sex, gender identity, tribal affiliation and related demographics where captured.

GET {baseUrl}/Patient/{id}; Patient?identifier={system|value}; Patient?name={name}&birthdate={date}&gender={gender}  
 Authorization: Bearer {accessToken}  
 Accept: application/fhir+json

### 7.2 Encounter

Field	Details
Purpose	Visit and encounter history
Search Pattern	Encounter?patient={patientId}&date=ge{fromDate}&date=le{toDate}
Required Scope	patient/Encounter.read
Response	FHIR Bundle for searches; FHIR resource for read by id.
Notes	Returns ambulatory, inpatient, emergency, telehealth, and other encounter records where available.

GET {baseUrl}/Encounter?patient={patientId}&date=ge{fromDate}&date=le{toDate}  
 Authorization: Bearer {accessToken}  
 Accept: application/fhir+json

### 7.3 Coverage

Field	Details
Purpose	Patient insurance coverage
Search Pattern	Coverage?patient={patientId}
Required Scope	patient/Coverage.read
Response	FHIR Bundle for searches; FHIR resource for read by id.

Notes	Coverage records for active and historical insurance plans.
-------	---

GET {baseUrl}/Coverage?patient={patientId}  
 Authorization: Bearer {accessToken}  
 Accept: application/fhir+json

### 7.4 AllergyIntolerance

Field	Details
Purpose	Allergies and intolerances
Search Pattern	AllergyIntolerance?patient={patientId}
Required Scope	patient/AllergyIntolerance.read
Response	FHIR Bundle for searches; FHIR resource for read by id.
Notes	Allergy type, clinical status, verification status, criticality, reaction, and manifestation.

GET {baseUrl}/AllergyIntolerance?patient={patientId}  
 Authorization: Bearer {accessToken}  
 Accept: application/fhir+json

### 7.5 Condition

Field	Details
Purpose	Problems, health concerns, and diagnoses
Search Pattern	Condition?patient={patientId}&category=problem-list-item; Condition?patient={patientId}&category=health-concern; Condition?patient={patientId}&category=encounter-diagnosis
Required Scope	patient/Condition.read
Response	FHIR Bundle for searches; FHIR resource for read by id.
Notes	Problem list items, health concerns, and encounter diagnoses.

GET {baseUrl}/Condition?patient={patientId}&category=problem-list-item;  
 Condition?patient={patientId}&category=health-concern; Condition?patient={patientId}&category=encounter-diagnosis  
 Authorization: Bearer {accessToken}  
 Accept: application/fhir+json

### 7.6 MedicationRequest

Field	Details
Purpose	Medication orders / prescriptions
Search Pattern	MedicationRequest?patient={patientId}&status=active
Required Scope	patient/MedicationRequest.read
Response	FHIR Bundle for searches; FHIR resource for read by id.
Notes	Active and historical medication requests.

GET {baseUrl}/MedicationRequest?patient={patientId}&status=active  
 Authorization: Bearer {accessToken}  
 Accept: application/fhir+json

### 7.7 MedicationAdministration

Field	Details
Purpose	Medication administered during visit
Search Pattern	MedicationAdministration?patient={patientId}
Required Scope	patient/MedicationAdministration.read
Response	FHIR Bundle for searches; FHIR resource for read by id.
Notes	Medication administrations recorded during encounter or care episode.

GET {baseUrl}/MedicationAdministration?patient={patientId}  
 Authorization: Bearer {accessToken}  
 Accept: application/fhir+json

### 7.8 Medication

Field	Details
Purpose	Medication master details
Search Pattern	Medication/{id}
Required Scope	patient/Medication.read
Response	FHIR Bundle for searches; FHIR resource for read by id.
Notes	Medication coding and display details referenced by medication request/administration.

GET {baseUrl}/Medication/{id}  
 Authorization: Bearer {accessToken}  
 Accept: application/fhir+json

### 7.9 Observation - Laboratory

Field	Details
Purpose	Lab results
Search Pattern	Observation?patient={patientId}&category=laboratory&date=ge{fromDate}
Required Scope	patient/Observation.read
Response	FHIR Bundle for searches; FHIR resource for read by id.
Notes	LOINC-coded lab observations with value, unit, interpretation, reference range, effective date, and performer where available.

GET {baseUrl}/Observation?patient={patientId}&category=laboratory&date=ge{fromDate}  
 Authorization: Bearer {accessToken}  
 Accept: application/fhir+json

### 7.10 DiagnosticReport - Laboratory

Field	Details
Purpose	Lab report grouping
Search Pattern	DiagnosticReport?patient={patientId}&category=LAB
Required Scope	patient/DiagnosticReport.read
Response	FHIR Bundle for searches; FHIR resource for read by id.
Notes	Groups laboratory observations under a report.

GET {baseUrl}/DiagnosticReport?patient={patientId}&category=LAB  
 Authorization: Bearer {accessToken}  
 Accept: application/fhir+json

### 7.11 Observation - Vital Signs

Field	Details
Purpose	Vitals including BMI, height, weight, BP, pulse oximetry, heart rate, respiratory rate, temperature
Search Pattern	Observation?patient={patientId}&category=vital-signs
Required Scope	patient/Observation.read
Response	FHIR Bundle for searches; FHIR resource for read by id.
Notes	Supports US Core vital sign profiles and specific LOINC searches.

GET {baseUrl}/Observation?patient={patientId}&category=vital-signs  
 Authorization: Bearer {accessToken}  
 Accept: application/fhir+json

## 7.12 Observation - Social / Functional

Field	Details
Purpose	Smoking status, occupation, SDOH, pregnancy status, functional/cognitive/disability status
Search Pattern	Observation?patient={patientId}&category=survey
Required Scope	patient/Observation.read
Response	FHIR Bundle for searches; FHIR resource for read by id.
Notes	Screening and assessment observations based on LOINC, SNOMED CT, and supported profile definitions.

GET {baseUrl}/Observation?patient={patientId}&category=survey  
 Authorization: Bearer {accessToken}  
 Accept: application/fhir+json

## 7.13 DocumentReference

Field	Details
Purpose	C-CDA and clinical notes
Search Pattern	DocumentReference?patient={patientId}; DocumentReference?patient={patientId}&type={LOINC}
Required Scope	patient/DocumentReference.read
Response	FHIR Bundle for searches; FHIR resource for read by id.
Notes	C-CDA references, consultation notes, discharge summaries, H&P, procedure notes, progress notes, imaging narratives, lab narratives, and pathology reports.

GET {baseUrl}/DocumentReference?patient={patientId}; DocumentReference?patient={patientId}&type={LOINC}  
 Authorization: Bearer {accessToken}  
 Accept: application/fhir+json

## 7.14 DiagnosticReport - Notes

Field	Details
Purpose	Report and note exchange
Search Pattern	DiagnosticReport?patient={patientId}&code={LOINC}; DiagnosticReport?patient={patientId}&category={category}
Required Scope	patient/DiagnosticReport.read
Response	FHIR Bundle for searches; FHIR resource for read by id.
Notes	Clinical note/report metadata and presentedForm where enabled.

GET {baseUrl}/DiagnosticReport?patient={patientId}&code={LOINC};  
 DiagnosticReport?patient={patientId}&category={category}  
 Authorization: Bearer {accessToken}  
 Accept: application/fhir+json

## 7.15 Immunization

Field	Details
Purpose	Immunization history
Search Pattern	Immunization?patient={patientId}
Required Scope	patient/Immunization.read
Response	FHIR Bundle for searches; FHIR resource for read by id.
Notes	Vaccine code, occurrence date, status, lot, manufacturer, performer.

GET {baseUrl}/Immunization?patient={patientId}  
 Authorization: Bearer {accessToken}  
 Accept: application/fhir+json

## 7.16 Procedure

Field	Details
-------	---------

Purpose	Procedures and procedure orders
Search Pattern	Procedure?patient={patientId}
Required Scope	patient/Procedure.read
Response	FHIR Bundle for searches; FHIR resource for read by id.
Notes	Performed procedures and procedure-related orders where represented as Procedure.

GET {baseUrl}/Procedure?patient={patientId}  
 Authorization: Bearer {accessToken}  
 Accept: application/fhir+json

### 7.17 ServiceRequest

Field	Details
Purpose	Lab, diagnostic imaging, procedure orders, referrals, SDOH interventions
Search Pattern	ServiceRequest?patient={patientId}&category={code}
Required Scope	patient/ServiceRequest.read
Response	FHIR Bundle for searches; FHIR resource for read by id.
Notes	Requests/orders including referral and intervention workflows.

GET {baseUrl}/ServiceRequest?patient={patientId}&category={code}  
 Authorization: Bearer {accessToken}  
 Accept: application/fhir+json

### 7.18 CarePlan

Field	Details
Purpose	Assessment and plan of treatment
Search Pattern	CarePlan?patient={patientId}&category=assess-plan
Required Scope	patient/CarePlan.read
Response	FHIR Bundle for searches; FHIR resource for read by id.
Notes	Plan of treatment and care plan activities.

GET {baseUrl}/CarePlan?patient={patientId}&category=assess-plan  
 Authorization: Bearer {accessToken}  
 Accept: application/fhir+json

### 7.19 CareTeam

Field	Details
Purpose	Care team members
Search Pattern	CareTeam?patient={patientId}&status=active
Required Scope	patient/CareTeam.read
Response	FHIR Bundle for searches; FHIR resource for read by id.
Notes	Practitioners, organizations, and patient participants involved in care.

GET {baseUrl}/CareTeam?patient={patientId}&status=active  
 Authorization: Bearer {accessToken}  
 Accept: application/fhir+json

### 7.20 Goal

Field	Details
Purpose	Clinical and SDOH goals
Search Pattern	Goal?patient={patientId}
Required Scope	patient/Goal.read
Response	FHIR Bundle for searches; FHIR resource for read by id.

Notes	Patient goals including SDOH-related goals where documented.
-------	--

GET {baseUrl}/Goal?patient={patientId}  
 Authorization: Bearer {accessToken}  
 Accept: application/fhir+json

### 7.21 Device

Field	Details
Purpose	Implantable devices
Search Pattern	Device?patient={patientId}
Required Scope	patient/Device.read
Response	FHIR Bundle for searches; FHIR resource for read by id.
Notes	UDI, lot, serial, type, manufacture/expiration dates for implantable devices.

GET {baseUrl}/Device?patient={patientId}  
 Authorization: Bearer {accessToken}  
 Accept: application/fhir+json

### 7.22 FamilyMemberHistory

Field	Details
Purpose	Family history
Search Pattern	FamilyMemberHistory?patient={patientId}
Required Scope	patient/FamilyMemberHistory.read
Response	FHIR Bundle for searches; FHIR resource for read by id.
Notes	Family relationship and condition history where captured.

GET {baseUrl}/FamilyMemberHistory?patient={patientId}  
 Authorization: Bearer {accessToken}  
 Accept: application/fhir+json

### 7.23 Media

Field	Details
Purpose	Clinical images/media
Search Pattern	Media?patient={patientId}
Required Scope	patient/Media.read
Response	FHIR Bundle for searches; FHIR resource for read by id.
Notes	Media metadata and content references where enabled.

GET {baseUrl}/Media?patient={patientId}  
 Authorization: Bearer {accessToken}  
 Accept: application/fhir+json

### 7.24 Practitioner / PractitionerRole / Organization / Location

Field	Details
Purpose	Provider, organization, role, and facility directory
Search Pattern	Practitioner/{id}; PractitionerRole?practitioner={id}; Organization/{id}; Location/{id}
Required Scope	patient/*.read or user/*.read
Response	FHIR Bundle for searches; FHIR resource for read by id.
Notes	Referenced support resources used in clinical records.

GET {baseUrl}/Practitioner/{id}; PractitionerRole?practitioner={id}; Organization/{id}; Location/{id}  
 Authorization: Bearer {accessToken}  
 Accept: application/fhir+json

## 7.25 Provenance

Field	Details
Purpose	Source and attribution
Search Pattern	Provenance?target={resourceType}/{id}
Required Scope	patient/Provenance.read
Response	FHIR Bundle for searches; FHIR resource for read by id.
Notes	Attribution, source, author, and audit context for selected resources.

GET {baseUrl}/Provenance?target={resourceType}/{id}  
 Authorization: Bearer {accessToken}  
 Accept: application/fhir+json

## 8. CLINICAL DOCUMENT AND NOTE CODES

Document Type	LOINC Code	FHIR Access Pattern
Consultation Note	11488-4	DocumentReference?patient={patientId}&type=http://loinc.org 11488-4
Discharge Summary	18842-5	DocumentReference?patient={patientId}&type=http://loinc.org 18842-5
History & Physical Note	34117-2	DocumentReference?patient={patientId}&type=http://loinc.org 34117-2
Procedures Note	28570-0	DocumentReference?patient={patientId}&type=http://loinc.org 28570-0
Progress Note	11506-3	DocumentReference?patient={patientId}&type=http://loinc.org 11506-3
Imaging Narrative	18748-4	DocumentReference?patient={patientId}&type=http://loinc.org 18748-4
Laboratory Report Narrative	11502-2	DocumentReference?patient={patientId}&type=http://loinc.org 11502-2
Pathology Report Narrative	11526-1	DocumentReference?patient={patientId}&type=http://loinc.org 11526-1
C-CDA / Summary of Care	34133-9	DocumentReference?patient={patientId}&type=http://loinc.org 34133-9

## 9. RESPONSE, ERROR, AND OPERATIONOUTCOME HANDLING

HTTP Status	Meaning	Typical Response
200	Success	FHIR resource or Bundle
201	Created	Only for enabled write APIs
400	Bad request	FHIR OperationOutcome with validation detail
401	Unauthorized	Missing, expired, invalid token
403	Forbidden	Scope, role, consent, or patient restriction
404	Not found	Resource or patient not found or inaccessible
409	Conflict	Version or business conflict
422	Unprocessable entity	FHIR validation/business rule error
429	Rate limited	Retry after indicated interval
500	Server error	Unexpected server error; contact MDFlow support with correlation id

```
{
  "resourceType": "OperationOutcome",
  "issue": [{
    "severity": "error",
    "code": "invalid",
    "diagnostics": "Missing required patient search parameter",
    "details": {"text": "patient is required"}
  }]
}
```

## 10. THIRD-PARTY INTEGRATION INTERFACES

Integration	Purpose	Primary Direction	Recommended Interface
CareQuality Network	Submit and fetch clinical summary of patient	Bidirectional	IHE/XCA/Carequality gateway with C-CDA DocumentReference integration
eRx Integration - DrFirst	Electronic prescribing workflow	Bidirectional	DrFirst eRx API/SSO integration with medication/order status callbacks into MDFlow

### 10.1 CareQuality Network Integration

- Purpose: submit and fetch patient clinical summary documents across Carequality-connected networks.
- MDFlow may expose retrieved documents as DocumentReference resources with C-CDA payloads or secure document URLs.
- Patient matching must use demographic matching rules approved for the network.
- All requests must be logged with purpose of use, user/system identity, patient, timestamp, and document id.

API / Flow	Description
Query patient documents	Search external network for available clinical summaries.
Retrieve document	Fetch selected C-CDA document and store/link it in MDFlow.
Submit clinical summary	Send MDFlow-generated C-CDA summary to external network endpoint when enabled.
FHIR exposure	DocumentReference?patient={patientId}&type=http://loinc.org 34133-9

### 10.2 eRx Integration - DrFirst

- Purpose: launch or integrate electronic prescribing workflows through DrFirst.
- Medication changes should be reconciled back into MDFlow medication lists and MedicationRequest records.
- Controlled substance prescribing requires additional identity proofing, permissions, and audit controls where applicable.
- Callbacks/status updates should include prescription id, patient id, medication, status, pharmacy, prescriber, and timestamp.

Flow	Description
Launch eRx	Provider opens DrFirst prescribing context from MDFlow.
New prescription	Prescription transaction recorded and mapped back to MedicationRequest.
Refill / change request	Inbound pharmacy request routed to provider workflow.
Cancel / discontinue	Status update reconciled in MDFlow medication list.

## 11. SECURITY, PRIVACY, AND COMPLIANCE

### 11.1 Transport and Network Security

- All endpoints must be accessed using HTTPS only.
- Production integrations should use allow listed redirect URIs and may use IP restrictions where contracted.
- Do not transmit tokens, PHI, or credentials in logs or browser history.

### 11.2 Token and Session Security

- Access tokens must be stored securely and treated as PHI-bearing credentials.
- Refresh tokens are issued only when approved and must be encrypted at rest.
- Public clients should use PKCE. Confidential clients should use private\_key\_jwt where possible.

### 11.3 Consent and Minimum Necessary

- MDFlow may filter responses based on consent, confidentiality flags, organization, provider relationship, and patient matching confidence.

- Third-party applications must request only the scopes required for the workflow.

### 11.4 Audit Logging

- All API calls are logged with client id, user/system id, patient id, resource, action, timestamp, source IP, and outcome.
- Audit logs must be retained according to customer policy and applicable regulations.

## 12. PARTNER ONBOARDING CHECKLIST

Step	Owner	Artifact / Outcome
Sign integration/API agreement	Partner + MDFlow	Approved legal and security agreement
Submit app registration details	Partner	Client name, redirect URLs, scopes, JWKS URL, contacts
Create sandbox client	MDFlow	client_id and sandbox endpoints
Connectivity and auth validation	Partner	Successful SMART launch/token/API call
FHIR resource validation	Partner + MDFlow	Validated Patient, Encounter, Observation, DocumentReference, etc.
Security review	Partner + MDFlow	Token storage, PHI handling, audit, support plan
Production approval	MDFlow	Production client credentials and go-live window

## APPENDIX A - SAMPLE CURL REQUESTS

```
curl -H "Authorization: Bearer {accessToken}" -H "Accept: application/fhir+json" "{baseUrl}/Patient/{patientId}"
```

```
curl -H "Authorization: Bearer {accessToken}" -H "Accept: application/fhir+json"
"{baseUrl}/Observation?patient={patientId}&category=vital-signs&_count=50"
```

```
curl -H "Authorization: Bearer {accessToken}" -H "Accept: application/fhir+json"
"{baseUrl}/DocumentReference?patient={patientId}&type=http://loinc.org|34133-9"
```

## APPENDIX B - ABBREVIATIONS

Term	Meaning
API	Application Programming Interface
C-CDA	Consolidated Clinical Document Architecture
FHIR	Fast Healthcare Interoperability Resources
JWK/JWKS	JSON Web Key / JSON Web Key Set
JWT	JSON Web Token
LOINC	Logical Observation Identifiers Names and Codes
OIDC	OpenID Connect
PHI	Protected Health Information
SMART	Substitutable Medical Applications and Reusable Technologies
US Core	United States Core Data for Interoperability FHIR implementation profiles