Medtech FHIR® API (ALEX)

Authorisation Details, Search Requests & Error Messages

Version: 1.2

Document Control

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Revision History

Date	Version	Description	Author
12/01/2021	1.0	Initial Draft	Prashanth Koval
25/01/2021	1.1	Updated Search Requests + Added Appointment Cancellation & Arrival status update details	Prashanth Koval
18/02/2021	1.2	Updated Search Requests + Added new Search Requests for DocumentReference, Binary + Updated Error Messages	Prashanth Koval

References

Title	Source	Version
[1]		
[2]		

Abbreviations and Terminology

Abbreviation	Definition
MT32	Medtech32
PMS	Practice Management Software
FHIR®	Fast Healthcare Interoperability Resources

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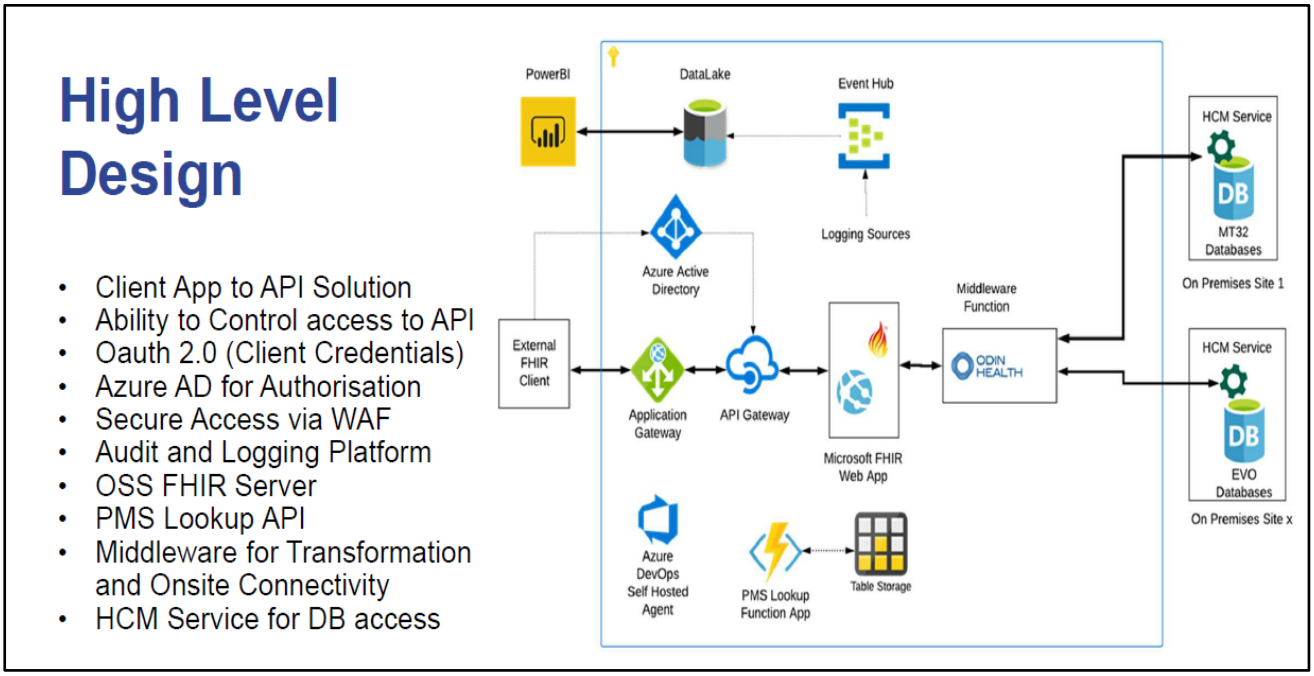
1 Context

1.1 Introduction

This document covers the Authentication process, Request Message details and Error Messages that will be required to integrate with Medtech's FHIR® API Solution (ALEX).

1.2 High Level Design for Medtech FHIR® API (ALEX)



The solution is made up of the following components: -

1. **Application Gateway** – this provides web traffic load balancing that enables the management of traffic to the FHIR® web application. It also provides a Web Application Firewall that helps protect web applications by filtering and monitoring HTTP traffic between a web application and the Internet. It typically protects web applications from attacks such as cross-site forgery, cross-site-scripting (XSS), file inclusion, and SQL injection, among others.
2. **Azure Active Directory** – this will provide an authorisation service for access to application and services, provides OAuth2.0 client credential authorisation.
3. **API Gateway** – this provides a platform to publish and control access to the FHIR® API, also can provide access to future API's.
4. **FHIR® Server** – Microsoft Open Source FHIR® implementation running as a .Net Web Application, it will NOT contain a persistence store (SQL or Cosmos), instead will get all data on the fly from the on-premises databases.
5. **Middleware** – this provides the hosting for the Core application microservices that transform the on-premises database schema to provide FHIR® resource data. This will be built using an Azure Kubernetes Service.
6. **Azure Relay** - The Azure Relay service enables secure exposure of services that run in the on-premises network to the public cloud.
7. **On-Premises Service** - this provides connectivity to the Azure Relay and transforms requests from web calls into native database queries.

8. **Event HUB** – this provides a mechanism of collecting events from the API Gateway, FHIR® Server or Functions and storing in the data lake.
9. **Data Lake** – provides storage for events, Data sent to an event hub can be transformed and stored by using any real-time analytics provider or batching/storage adapters.
10. **Table Storage** – this will contain a lookup table containing HPI Facility Code to Azure Relay Endpoint, this will also include any Health Status information about the PMS
11. **Self-Hosted DevOps Agent** – as the deployment of application code will be to the FHIR® Server and Function apps and as these will be VNet integrated and will not be accessible via there Public IP Address, we will need a Azure DevOps deployment agent within the VNet to allow access to the resources.

1.3 Integration Connectivity for UAT Testing

Integration testing will take place via a Sandbox which is the Medtech's UAT environment. Medtech would connect the UAT environment to a counterpart test server at a Third Party Vendor partner integrating with ALEX.

Medtech would like to have the integration testing to be fairly close to a production use-case (therefore an external Vendor partner server is preferable to a dedicated resource within the Medtech's Azure tenancy).

At present Medtech expects that the UAT environment will connect through to known test instances of various Medtech PMS versions that would be hosted within Medtech's Azure tenancy.

However, Medtech are investigating the possibility of making vendor partners test instances of Medtech PMS's available under UAT environment of ALEX, this will allow vendors to do true "end-to-end" testing with their own PMS instances.

1.3.1 Requirements for Integration Connectivity to Test Server

The vendor partner test server connection would involve (at least) the following: -

- Setting up an ALEX Azure AD account for vendor partner-Test.
  - ✓ This is a "per-service" account so if vendor partner has various services that need access to Medtech with different access-right requirements then Medtech will set up multiple accounts. Similarly, it is important that there is a distinct "Vendor Partner" account (or accounts) that are distinct from other connections to ALEX from the same vendor.
- Assigning the appropriate API scopes (permissions) to that AAD account.
- Assigning an Application ID – associated with the AAD account - that vendor partner will pass with a token on every API request.

Please Note: The token is obtained through an authentication call to AAD using a shared secret.

- Allow-listing the vendor partner server IP address on the UAT ALEX API endpoints.
- Approving the vendor partner Application ID for access to the test instances of Medtech (i.e. simulating practice consenting).

1.4 Vendor Partner Authentication Process while Connecting to ALEX

1.4.1 Overview

In order for a vendor application to make requests to the Medtech FHIR® API, a valid access token must be included in the requests. To obtain an access token, an authentication request is made to the identity provider service and the returned access token is then included in the headers of subsequent requests to the Medtech FHIR® API.

1.4.2 Request for an Access Token

To obtain an access token an authentication request is sent to the identity provider.

Medtech uses the following Microsoft Azure AD identity provider: https://login.microsoftonline.com/8a024e99-aba3-4b25-b875-28b0c0ca6096/oauth2/v2.0/token

Note: The unique identifier above is relative to the particular Azure Tenant. In the case of Medtech, this is always as above, regardless of environment.

1.4.3 Example Request

```
curl --request POST 'https://login.microsoftonline.com/8a024e99-aba3-4b25-b875-28b0c0ca6096/oauth2/v2.0/token'\
--form 'Client_id="589b9e7f-443d-4a29-a984-8f9e98c766b3"' \
--form 'Client_secret="xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx"' \
--form 'Grant_type="client_credentials"' \
--form 'Scope="api://bf0c0db0-08e7-4ed8-bb85-8d5676869424/.default"'
```

1.4.4 Request Details

Form value	Example	Description
client_id	589b9e7f-443d-4a29-a984-8f9e98c766b3	Unique identifier of the **vendor application**. Provided to the vendor by Medtech.
client_secret	xxxxxxxxxxxxxxxxxxxxxxxxxxxxxx	Secret associated with above unique identifier. Provided to the vendor by Medtech.
Scope	api://bf0c0db0-08e7-4ed8-bb85-8d5676869424/.default	Unique identifier of the **Medtech FHIR® API**. Provided to the vendor by Medtech.
Grant_type	client_credentials	Always this value.

1.4.5 Example Response

If the request was accepted, the identity provider will provide a response containing the access token. The access token can now be used to make requests to the Medtech FHIR® API.

{

"token_type": "Bearer",

"expires_in": 3599,

"ext_expires_in": 3599,

"access_token":
"eyJ0eXAiOiJKV1QiLCJhbGciOiJSUzI1NiIsIng1dCI6IjVPZjlQNUY5Z0NDd0NtRjJCT0hIeEREUS1EayIsImtpZCI6IjVPZjlQNUY5Z0NDd0NtRjJCT0hIeEREUS1EayJ9.eyJhdWQiOiJhcGk6Ly9iZjBjMGRiMC0wOGU3LTRlZDgtYmI4NS04ZDU2NzY4Njk0MjQiLCJpc3MiOiJodHRwczovL3N0cy53aW5kb3dzLm5ldC84YTAyNGU5OS1hYmEzLTRiMjUtYjg3NS0yOGIwYzBjYTYwOTYvIiwiaWF0IjoxNjA5ODg5OTUxLCJuYmYiOjE2MDk4ODk5NTEsImV4cCI6MTYwOTg5Mzg1MSwiYWlvIjoiRTJKZ1IlQTBtbVlwdHZuenBUbVMvN1k5WFhEMEh3QT0iLCJhcHBpZCI6IjU4OWI5ZTdmLTQ0M2QtNGEyOS1hOTg0LThmOWU5OGM3NjZiMyIsImFwcGlkYWNyIjoiMSIsImlkcCI6Imh0dHBzOi8vc3RzLndpbmRvd3MubmV0LzhhMDI0ZTk5LWFiYTMtNGIyNS1iODc1LTI4YjBjMGNhNjA5Ni8iLCJvaWQiOiJhMDBjMjJkZi04MzFhLTRmZmYtYjkwMy00MGEyOTdlZjQ1MzAiLCJyaCI6IjAuQUFBQW1VNENpcU9ySlV1NGRTaXd3TXBnbG4tZW0xZzlSQ2xLcVlTUG5wakhack5uQUFBLiIsInJvbGVzIjpbIlBhdGllbnQuUmVhZCJdLCJzdWIiOiJhMDBjMjJkZi04MzFhLTRmZmYtYjkwMy00MGEyOTdlZjQ1MzAiLCJ0aWQiOiI4YTAyNGU5OS1hYmEzLTRiMjUtYjg3NS0yOGIwYzBjYTYwOTYiLCJ1dGkiOiJPaWdMRVJmcUNrcVV6LUswMVZzWkFRliwidmVyIjoiMS4wIn0.PeymJWgxMJFhqFzjqQjz89kblMUhAqLs0x996w3CukzTZEUb6W2gvXa0zIP-1_WayIsvQzGPrWH77BwLAMwr_xA3UuLVIcx34wHlCscCHfwpFWWiLkISAD6W6yal8SjAQSb5YLIt37HOyj4lBMviEN5W_GtGPXfBsW35XZzNwIiXU_xqxEAZ9HXp1kVyHZgJAirNxOhWveGsj2zCM56LKW-eZvI- LzlJquWOaR6W3EsRvd2aeuqVhHmSG2PXwvivUeD9LxVb _voI9B0Bymunc1BaK50AcvAgWI5ULVFvaJ6UljsAUl22e97izWZ-fDNk8SzrBOjvI4U6JLfUeNQaoQ"

}

Please Note: The access token has an expiry time (**1 hour** by default currently). Once this has elapsed, a new access token needs to be requested from the identity provider.

1.5 Subsequent Requests to Medtech FHIR® API (ALEX) Post Authorisation

1.5.1 Overview

The access token which was obtained from the identity provider can now be used to make authenticated requests to the Medtech FHIR® API. Depending on which environment is being accessed e.g. UAT / PRODUCTION, the host name will vary.

The Authorization header should now be added to every request, with the value of the access token prefixed by **"Bearer "**.

The second call is to the APIM and should contain the access token and facility id as request headers. The APIM will validate the access token and generate a correlation ID request header. It will then forward the request to the FHIR® Server. The FHIR® Server will also validate the access token, verify the scopes, extract the scopes from the access token (into a new request header) and then forward the request to the NeXT endpoint.

1.5.2 UAT & Production End Points

Environment	Audience	API Endpoint URL
UAT (Sandbox)	Vendors for Development and Test	alexapiuat.medtechglobal.com/FHIR
Production	Vendors for Production use	alexapi.medtechglobal.com/FHIR

1.5.3 Request Header Details

Request header	Example	Added by	Consumed by	Description
Authorization	Bearer xxxxxxxxxx	Vendor	APIM, FHIR® Server	**(Required)** JWT, issued by AAD, required for every request
mt-facilityid	12345678	Vendor	NeXT	Facility ID for which the request is intended
mt-correlationid	d28e3c6e-5f9a-4527-b567-faae0f8e9c46	APIM (Azure API Management)	Multiple	Random GUID value

1.5.4 Example

UAT - curl --request GET 'https://alexapiuat.medtechglobal.com/FHIR/Patient/1'\

Production - curl --request GET 'https://alexapi.medtechglobal.com/FHIR/Patient/1'\

--header 'Authorization: Bearer
eyJ0eXAiOiJKV1QiLCJhbGciOiJSUzI1NiIsIng1dCI6IjVPZjlQNUY5Z0NDd0NtRjJCT0hIeEREUS1EayIsI
mtpZCI6IjVPZjlQNUY5Z0NDd0NtRjJCT0hIeEREUS1EayJ9.eyJhdWQiOiJhcGk6Ly9iZjBjMGRiMC0w
OGU3LTRlZDgtYmI4NS04ZDU2NzY4Njk0MjQiLCJpc3MiOiJodHRwczovL3N0cy53aW5kb3dzLm5ld
C84YTAyNGU5OS1hYmEzLTRiMjUtYjg3NS0yOGIwYzBjYTYwOTYvIiwiaWF0IjoxNjA5ODg5OTUxLCJ
uYmYiOjE2MDk4ODk5NTEsImV4cCI6MTYwOTg5Mzg1MSwiYWlvIjoiRTJKZ1IlQTBtbVlwdHZuenBUb
VMvN1k5WFhEMEh3QT0iLCJhcHBpZCI6IjU4OWI5ZTdmLTQ0M2QtNGEyOS1hOTg0LThmOWU5O
GM3NjZiMyIsImFwcGlkYWNyIjoiMSIsImlkcCI6Imh0dHBzOi8vc3RzLndpbmRvd3MubmV0LzhhMDI
0ZTk5LWFiYTMtNGIyNS1iODc1LTI4YjBjMGNhNjA5Ni8iLCJvaWQiOiJhMDBjMjJkZi04MzFhLTRmZmY
tYjkwMy00MGEyOTdlZjQ1MzAiLCJyaCI6IjAuQUFBQW1VNENpcU9ySlV1NGRTaXd3TXBnbG4tZW
0xZzlSQ2xLcVlTUG5wakhack5uQUFBLiIsInJvbGVzIjpbIlBhdGllbnQuUmVhZCJdLCJzdWIiOiJhMD
BjMjJkZi04MzFhLTRmZmYtYjkwMy00MGEyOTdlZjQ1MzAiLCJ0aWQiOiI4YTAyNGU5OS1hYmEzLTRi
MjUtYjg3NS0yOGIwYzBjYTYwOTYiLCJ1dGkiOiJPaWdMRVJmcUNrcVV6LUswMVZzWkFRIiwidmVy
IjoiMS4wIn0.PeymJWgxMJFhqFzjqQjz89kblMUhAqLs0x996w3CukzTZEUb6W2gvXa0zIP-
1_WayIsvQzGPrWH77BwLAMwr_xA3UuLVIcx34wHlCscCHfwpFWWiLklSAD6W6yal8SjAQSb5YLIt3
7HOyj4lBMviEN5W_GtGPXfBsW35XZzNwIiXU_xqxEAZ9HXp1kVyHZgJAirNxOhWveGsj2zCM56LKW
-eZvl-
LzlJquWOaR6W3EsRvd2aeuqVhHmSG2PXwvivUeD9LxVb_vol9B0Bymunc1BaK50AcvAgWl5ULV
FvaJ6UljsAUl22e97izWZ-fDNk8SzrBOjvI4U6JLfUeNQaoQ'

An invalid token will result in a HTTP 401 error

```
{
   "statusCode": 401,
   "message": "Unauthorized. Access token is missing or invalid."
}
```

2 Search Request Query Strings for Retrieving Data from Medtech FHIR® API (ALEX)

2.1 Retrieval of entire Patient Health Summary

2.1.1 Search Parameters

Name	Type	Description
NHI	token	**(Mandatory)** The NHI Number of the patient for whom the Health Summary is requested for

Please Note- The request header details to be used for the search requests have been provided under section **1.5.3** above.

2.1.2 Request Examples

Please replace [base] with appropriate endpoints for UAT or Production as provided below-

UAT - alexapiuat.medtechglobal.com/FHIR

Production - alexapi.medtechglobal.com/FHIR

Retrieve Patients Health Summary by providing the NHI Number as a Patient Identifier

```
GET
https://[base]/Patient/$summary?identifier=https://standards.digital.health.nz/ns/nhi-id|ABC2345
```

This retrieval query will upload the following resources by default-

S.No	Resources	Long Term Record Included	Confidential Record Included	Inactive Record Included	Data Content
1	Patient	N/A	N/A	N/A	All Patient Demographics
2	Condition	Yes	No	No	All Conditions
3	MedicationStatement	Yes	No	No	Long Term Medications only
4	Observation (Screening)	N/A	No	No	All screenings

5	AllergyIntolerance	N/A	N/A	No	All Medical Warnings
6	Immunisation	N/A	N/A	No	All Immunisation
7	DiagnosticReport	N/A	No	No	All Lab Results & Radiology Results
8	DocumentReference	N/A	No	No	All Consultation Notes All Discharge Summaries All Referrals All Specialist Report

Please Note –

1. The HPI Facility Number of the practice, where the patient's Health Summary is being requested for must be part of the Request Header.

2. If specific data have to be retrieved, then the query request to retrieve these must be sent separately, for example to retrieve only long-term Classifications, a separate request can be sent.

3. Confidential data is not supplied as default, if a third party integration vendor must require confidential record then they would have to provide a separate Search Request for individual resources to retrieve the confidential data.

4. The PDF attachments will not be included in the DocumentReference resource in the first instance for Discharge Summaries, Referrals & Specialist Report. Instead the BLOBKey will be passed on, if the PDF Attachment binary is required, a separate request must be made with the BLOBKey as the ID and to retrieve the attachment binary data.

2.2 Retrieval of only Classification Data (Condition FHIR® Resource)

2.2.1 Search Parameters

Name	Type	Description
identifier	token	**(Mandatory)** The NHI Number of the patient for whom the Classification is requested for
long-term-condition	string	The response will include only those classifications that have been marked long term. The long term flag has been included as an extension under the Condition resource, hence the full URL must be passed in the search request- http://hl7.org.nz/FHIR®/StructureDefinition/long-term-condition | True
clinical-status	string	The clinical status of the classification, if this is active or inactive
ID	number	The unique resource id
confidential	string	Confidential flag

Please Note- The request header details to be used for the search requests have been provided under section **1.5.3** above.

2.2.2 Request Examples

Please replace [base] with appropriate endpoints for UAT or Production as provided below-

UAT - alexapiuat.medtechglobal.com/FHIR

Production - alexapi.medtechglobal.com/FHIR

Retrieve All Classifications based on patients NHI number

```
GET https://[base]/Condition?patient.identifier=https://standards.digital.health.nz/ns/nhi-id|ABC2345
```

Retrieve All Classifications based on patients ID

```
GET https://[base]/Condition?patient._id=XXXXXXX
```

Retrieve single Classification based on Classification Resource ID (Direct Read)

```
GET https://[base]/Condition/XXXXXXXXX
```

Retrieve single Classification based on Classification Resource ID

```
GET https://[base]/Condition?_id=XXXXXXXXXX
```

Retrieve Classifications that have been marked as Long Term

```
GET
https://[base]/Condition?patient.identifier=https://standards.digital.health.nz/ns/nhi-id|ABC2345&long-term-condition=true
```

Retrieve classifications that have been marked inactive

```
GET
https://[base]/Condition?patient.identifier=https://standards.digital.health.nz/ns/nhi-id|ABC2345&clinical-status=inactive
```

Retrieve Classifications that have been marked as Confidential

```
GET
https://[base]/Condition?patient.identifier=https://standards.digital.health.nz/ns/nhi-id|ABC2345&_security=http://terminology.hl7.org/CodeSystem/v3-Confidentiality|R
```

2.3 Retrieval of only Medication Data (Medication Request FHIR® Resource)

2.3.1 Search Parameters

Name	Type	Description
identifier	token	**(Mandatory)** The NHI Number of the patient for whom the Medication data is requested for
nzeps-long-term-medication	string	The response will include only those medications that have been marked long term.
status	string	The clinical status of the medication, if this is active or inactive. Since FHIR doesn't have inactive status, we will use the status:not=active parameter to obtain inactive status medications.
ID	reference	The unique resource id
confidential	string	Confidential flag

Please Note- The request header details to be used for the search requests have been provided under section **1.5.3** above.

2.3.2 Request Examples

Please replace [base] with appropriate endpoints for UAT or Production as provided below-

UAT - alexapiuat.medtechglobal.com/FHIR

Production - alexapi.medtechglobal.com/FHIR

Retrieve All Medications based on Patients NHI Number

```
GET
https://[base]/MedicationRequest?patient.identifier=https://standards.digital.health.nz/ns/nhi-id|ABC2345
```

Retrieve All Medications based on Patients ID

```
GET https://[base]/MedicationRequest?patient._id=XXXXXXXX
```

Retrieve single Medication based on Resource ID

```
GET https://[base]/MedicationRequest?_id=XXXXXXXX
```

Retrieve single Medication based on Resource ID (Direct Read)

```
GET https://[base]/MedicationRequest/XXXXXXXX
```

Retrieve Medications that have been marked as Long Term

```
GET
https://[base]/MedicationRequest?patient.identifier=https://standards.digital.health.nz/ns/nhi-id|ABC2345&nzeps-long-term-medication=true
```

Retrieve Medications that have been marked as Confidential

```
GET
https://[base]/MedicationRequest?patient.identifier=https://standards.digital.health.nz/ns/nhi-id|ABC2345&_security=http://terminology.hl7.org/CodeSystem/v3-Confidentiality|R
```

Retrieve Medications that have been marked inactive

```
GET
https://[base]/MedicationRequest?patient.identifier=https://standards.digital.health.nz/ns/nhi-id|ABC2345&status:not=active
```

2.4 Retrieval of only Screening Data (Observation FHIR® Resource)

2.4.1 Search Parameters

Name	Type	Description
identifier	token	**(Mandatory)** The NHI Number of the patient for whom the screening data is requested for
ID	reference	The unique resource ID
Patients ID	reference	The unique ID for the patient
confidential	string	Confidential flag, part of security tag

Please Note- The request header details to be used for the search requests have been provided under section **1.5.3** above.

2.4.2 Request Examples

Please replace [base] with appropriate endpoints for UAT or Production as provided below-

UAT - alexapiuat.medtechglobal.com/FHIR

Production - alexapi.medtechglobal.com/FHIR

Retrieve All Screenings based on Patients NHI Number

```
GET
https://[base]/Observation?patient.identifier=https://standards.digital.health.nz/ns/nhi-id|ABC2345
```

Retrieve All Screenings based on Patients ID

```
GET https://[base]/Observation?patient._id=XXXXXXXXXX
```

Retrieve single Screening based on Resource ID

```
GET https://[base]/Observation?_id=XXXXXXXXXX
```

Retrieve single Screening based on Resource ID (Direct Read)

```
GET https://[base]/Observation/XXXXXXXXXX
```

Retrieve Screenings that have been marked as Confidential

```
GET
https://[base]/Observation?patient.identifier=https://standards.digital.health.nz/ns/nhi-id|ABC2345&_security=http://terminology.hl7.org/CodeSystem/v3-Confidentiality|R
```

2.5 Retrieval of only Consultation Data (DocumentReference FHIR® Resource)

2.5.1 Search Parameters

Name	Type	Description
identifier	token	**(Mandatory)** The NHI Number of the patient for whom the Consultation data is requested for
ID	reference	The unique resource ID
confidential	string	Confidential flag, part of security tag
Patients ID	reference	The unique ID for the patient

Please Note- The request header details to be used for the search requests have been provided under section **1.5.3** above.

2.5.2 Request Examples

Please replace [base] with appropriate endpoints for UAT or Production as provided below-

UAT - alexapiuat.medtechglobal.com/FHIR

Production - alexapi.medtechglobal.com/FHIR

Retrieve All Consultation Notes for a Patient based on their NHI number

```
GET
https://[base]/DocumentReference?patient.identifier=https://standards.digital.health.nz/ns/nhi-id|ABC2345&type=http://loinc.org|11488-4
```

Retrieve single Consultation Notes for a Patient based on Resource ID

```
GET https://[base]/DocumentReference?_id=XXXXXXXXX
```

Retrieve single Consultation Notes for a Patient based on Resource ID (Direct Read)

```
GET https://[base]/DocumentReference/XXXXXXXXX
```

Retrieve All Consultation Notes for a Patient based on Patient's ID

```
GET
https://[base]/DocumentReference?patient._id=XXXXXX&type=http://loinc.org|11488-4
```

Retrieve Consultation Notes that have been marked as Confidential

```
GET
https://[base]/DocumentReference?patient.identifier=https://standards.digital.health.nz/ns/nhi-id|ABC2345&type=http://loinc.org|11488-4&_security=
http://terminology.hl7.org/CodeSystem/v3-Confidentiality|R
```

2.6 Retrieval of only Immunisation Data (Immunization FHIR® Resource)

2.6.1 Search Parameters

Name	Type	Description
identifier	token	**(Mandatory)** The NHI Number of the patient for whom the Immunisation data is requested for
ID	reference	The Unique resource ID
Patients ID	reference	The Patients unique ID

Please Note- The request header details to be used for the search requests have been provided under section **1.5.3** above.

2.6.2 Request Examples

Please replace [base] with appropriate endpoints for UAT or Production as provided below-

UAT - alexapiuat.medtechglobal.com/FHIR

Production - alexapi.medtechglobal.com/FHIR

Retrieve All Immunisations based on Patients NHI Number

```
GET https://[base]/Immunization?patient.identifier=https://standards.digital.health.nz/ns/nhi-id|ABC2345
```

Retrieve All Immunisations based on Patients ID

```
GET https://[base]/Immunization?patient._id=XXXXXXXXX
```

Retrieve single Immunisations based on Resource ID

```
GET https://[base]/Immunization?_id=XXXXXXXXX
```

Retrieve single Immunisations based on Resource ID (Direct Read)

```
GET https://[base]/Immunization/XXXXXXXXX
```

2.7 Retrieval of only Laboratory Results Data (Diagnostic Report FHIR® Resource)

2.7.1 Search Parameters

Name	Type	Description
identifier	token	**(Mandatory)** The NHI Number of the patient for whom the Laboratory Results data is requested for
ID	reference	The unique Resource ID
Patients ID	reference	The Patients unique ID

Please Note- The request header details to be used for the search requests have been provided under section **1.5.3** above.

2.7.2 Request Examples

Please replace [base] with appropriate endpoints for UAT or Production as provided below-

UAT - alexapiuat.medtechglobal.com/FHIR

Production - alexapi.medtechglobal.com/FHIR

Retrieve All Lab Results based on Patients NHI Number

```
GET
https://[base]/DiagnosticReport?patient.identifier=https://standards.digital.health.nz/ns/nhi-id|ABC2345
```

Retrieve All Lab Results based on Patients ID

```
GET  https://[base]/DiagnosticReport?patient._id=XXXXXXXX
```

Retrieve single Lab Result based on Resource ID

```
GET  https://[base]/DiagnosticReport?_id=XXXXXXXX
```

Retrieve single Lab Result based on Resource ID (Direct Read)

```
GET  https://[base]/DiagnosticReport/XXXXXXXX
```

Retrieve All Lab Results that have been marked as Confidential

```
GEThttps://[base]/DiagnosticReport?patient.identifier=https://standards.digital.health.nz/ns/nhi-id|ABC2345&_security=http://terminology.hl7.org/CodeSystem/v3-Confidentiality|R
```

2.8 Retrieval of only Medical Warning Data (Allergy Intolerance FHIR® Resource)

2.8.1 Search Parameters

Name	Type	Description
identifier	token	The NHI Number of the patient for whom the Medication data is requested for
ID	reference	The Unique Resource ID
Patients ID	reference	The Patients unique ID

Please Note- The request header details to be used for the search requests have been provided under section **1.5.3** above.

2.8.2 Request Examples

Please replace [base] with appropriate endpoints for UAT or Production as provided below-

UAT - alexapiuat.medtechglobal.com/FHIR

Production - alexapi.medtechglobal.com/FHIR

Retrieve All Medical Warnings based on Patients NHI Number

```
GET https://[base]/AllergyIntolerance?patient.identifier=https://standards.digital.health.nz/ns/nhi-id|ABC2345
```

Retrieve All Medical Warnings based on Patients ID

```
GET https://[base]/ AllergyIntolerance?patient._id=XXXXXXXX
```

Retrieve single Medical Warning based on Resource ID

```
GET https://[base]/ AllergyIntolerance?_id=XXXXXXXX
```

Retrieve single Medical Warning based on Resource ID (Direct Read)

```
GET https://[base]/ AllergyIntolerance/XXXXXXXX
```

Retrieve Medical Warnings that have been marked inactive

```
GET https://[base]/AllergyIntolerance?patient.identifier=https://standards.digital.health.nz/ns/nhi-id|ABC2345&clinical-status=inactive
```

2.9 Retrieval of only Inbox RSD Messages (DocumentReference FHIR® Resource)

2.9.1 Search Parameters

Name	Type	Description
identifier	token	The NHI Number of the patient for whom the Inbox RSD Message data is requested for
id	reference	The unique resource id
Patient's id	reference	The unique id for the patient
confidential	string	Confidential flag, part of security tag

Please Note- The request header details to be used for the search requests have been provided under section **1.5.3** above.

2.9.2 Request Examples

Please replace [base] with appropriate endpoints for UAT or Production as provided below-

UAT - alexapiuat.medtechglobal.com/FHIR

Production - alexapi.medtechglobal.com/FHIR

Retrieve All Inbox Messages (RSD Records) for a Patient based on their NHI number

```
GET
http://[base]/DocumentReference?patient.identifier=https://standards.digital.health.nz/ns/nhi-id|ABC2345&type=http://loinc.org|34109-9
```

Retrieve single Inbox Messages (RSD Records) for a Patient based on Resource ID

```
GET  http://[base]/DocumentReference?_id=XXXXXXXXX
```

Retrieve single Inbox Messages (RSD Records) for a Patient based on Resource ID (Direct Read)

```
GET  http://[base]/DocumentReference/XXXXXXXXX
```

Retrieve All Inbox Messages (RSD Records) for a Patient based on Patient's ID

```
GET
https://[base]/DocumentReference?patient._id=XXXXXX&type=http://loinc.org|34109-9
```

Retrieve Inbox Messages (RSD Records) that have been marked as Confidential

```
GET
https://[base]/DocumentReference?patient.identifier=https://standards.digital.heal
th.nz/ns/nhi-id|ABC2345&type=http://loinc.org|34109-9&_security=
http://terminology.hl7.org/CodeSystem/v3-Confidentiality|R
```

2.9.3 Search Request for Retrieving Binary of the Attachment

The DocumentReference resource that will contain the Inbox RSD message will not have the attachments, instead the BlobKey of the attachment will be passed. The third party vendor would have to obtain this Blobkey and send another request message (as given below) to obtain the binary data of the attachment.

Retrieve Attachment data from Inbox Message (RSD Record) for a Patient based on the BlobKey

```
GET http://[base]/Binary/BlobKey
```

2.10 Retrieval of Appointment Slot for a Provider (Slot FHIR® Resource)

2.10.1 Search Parameters

Name	Type	Description
HPICPN/NZMC	reference	**(Mandatory)** The Identifier (HPICPN/NZMC) of the actor in this case the Provider
start	date	**(Mandatory)** The response will include 1 week of slots subsequent to the start date (If the end date is not provided, by default 1 weeks data will be extracted)
status	token	The free/busy status of the slot

Please Note- The request header details to be used for the search requests have been provided under section **1.5.3** above.

2.10.2 Request Examples

Please replace [base] with appropriate endpoints for UAT or Production as provided below-

UAT - alexapiuat.medtechglobal.com/FHIR

Production - alexapi.medtechglobal.com/FHIR

Retrieve Appointment Slot for a Provider based on the HPI CPN number & Start date/time provided- to retrieve default 1 weeks slots for a provider

GET
https://[base]/Slot?schedule.actor.identifier=https://standards.digital.health.nz/ns/hpi-person-id|HPICPNXXXX&start=ge2020-01-21T11:00:00Z

Retrieve Appointment Slot for a Provider based on the HPI CPN number and start & end date/time provided – for example to retrieve 1 days slots for a provider

GET
https://[base]/Slot?schedule.actor.identifier=https://standards.digital.health.nz/ns/hpi-person-id|HPICPNXXXX&start=ge2020-01-21T11:00:00Z&start=le2020-01-21T18:00:00Z

Retrieve Appointment Slot for a Provider based on the HPI CPN number, start date/time provided and slot status of Free- to retrieve only free slots for a week

GET
https://[base]/Slot?schedule.actor.identifier=https://standards.digital.health.nz/ns/hpi-person-id|HPICPNXXXX&start=ge2020-01-21T11:00:00Z&status=free

2.11 Retrieval of Current Appointment Booking details for a Provider (Appointment FHIR® Resource)

2.11.1 Search Parameters

Name	Type	Description
slot	reference	The Slot Identifier obtained as part of the Slot resource can be used to obtain the current appointment status for a Provider.
date	date	The date parameter is given with ge & le prefixes to denote the appointment start/end dates.
ID	token	Unique reference number provided to the booked Appointment
practitioner	reference	The provider under whom the appointment has been booked
patient	reference	The patient for whom an appointment has been booked

Please Note- The request header details to be used for the search requests have been provided under section **1.5.3** above.

Either of the Patient or Practitioner Identifier is mandatory to retrieve current bookings

2.11.2 Request Examples

Please replace [base] with appropriate endpoints for UAT or Production as provided below-

UAT - alexapiuat.medtechglobal.com/FHIR

Production - alexapi.medtechglobal.com/FHIR

Retrieve Appointment Booking details based on the Slot reference number

```
GET https://[base]/Appointment?slot._id=456XXX
```

Retrieve Appointment Booking details based on the Appointment Reference number (Appointment ID if known)

```
GET https://[base]/Appointment?_id=897XXX
```

Retrieve Appointment Booking details based on the Appointment Reference number (Appointment ID if known) – Direct Read

```
GET https://[base]/Appointment/897XXX
```

Retrieve Appointment Booking details based on Slot Reference Number and Patients NHI Number

```
GET
https://[base]/Appointment?slot._id=456XXXX&patient.identifier=https://standards.digital.health.nz/ns/nhi-id|ABC2345
```

Retrieve Appointment Booking details based on start & end date/time provided and Provider Identifier

```
GET
https://[base]/Appointment?practitioner.identifier=https://standards.digital.health.nz/ns/hpi-person-id|HPICPNXXXX&date=ge2020-01-21T11:00:00Z&date=le2020-01-21T18:00:00Z
```

Retrieve Appointment Booking details based on start & end date/time provided and Patient Identifier

```
GET
https://[base]/Appointment?patient.identifier=https://standards.digital.health.nz/ns/nhi-id|ABC2345&date=ge2020-01-21T11:00:00Z&date=le2020-01-21T18:00:00Z
```

Retrieve Appointment Booking details based on start & end date/time, Patient Identifier & Booking Status

`GET`
https://[base]/Appointment?patient.identifier=https://standards.digital.health.nz/ns/nhi-id|ABC2345&date=ge2020-01-21T11:00:00Z&date=le2020-01-21T18:00:00Z&status=booked

2.12 Creating a new Patient Appointment for a Provider (Appointment FHIR® Resource)

The request payload must be passed under the standard FHIR Appointment resource.

The following URL must be called to pass this payload-

POST http://[base]/Appointment/

Vendor systems:

- SHALL send an Appointment resource that conforms to the FHIR Appointment profile.
- SHALL include the base URI for ALEX UAT or Production.
- The HPI Facility of the Location where the appointment has be booked must be provided under the Request header.

The following data elements are mandatory (that is, data MUST be present):

- The ID of the patient participant of the appointment (you must obtain this before booking the appointment)
- The ID of the Practitioner of the appointment (you must obtain this before booking the appointment)
- the start date/time of the appointment.
- the status identifying the appointment as "booked".
-

The following data elements are optional:

- the slot reference number obtained through the slot resource retrieval. (optional)
- ID of the Location where the appointment is being booked.

Please Note: The Appointment ID won't be required to be passed by the vendor, we will send the ID of the appointment as part of response message.

2.13 Changing Appointment status to "Arrived" for a Patient (Appointment FHIR® Resource)

The request payload must be passed under the standard FHIR Appointment resource.

The following URL must be called to pass this payload-

PUT
https://[base]/Appointment?patient.identifier=https://standards.digital.health.nz/ns/nhi-id|ABC2345

Vendor systems:

- SHALL send an Appointment resource that conforms to the FHIR Appointment profile.
- SHALL include the base URI for ALEX UAT or Production.
- The HPI Facility of the Location where the appointment has been booked and now the status is being changed to "arrived" must be provided under the Request header.

The following data elements are mandatory (that is, data MUST be present):

- The patient's NHI Number as an identifier (provided under the Search Request)
- The patients ID available under the Payload.

- a Practitioner of the appointment.
- the start and end date/time of the appointment
- the status identifying the appointment as "arrived".

The following data elements are optional:

- The GUID reference number for the Appointment (ID)
- the slot reference number obtained through the slot resource retrieval.

2.14 Cancelling an Appointment for a Patient

The following URL must be called to cancel an appointment-

PUT
`https://[base]/Appointment?patient.identifier=https://standards.digital.health.nz/ns/nhi-id|ABC2345`

Vendor systems:

- SHALL send an Appointment resource that conforms to the FHIR Appointment profile.
- SHALL include the base URI for ALEX UAT or Production.
- The HPI Facility of the Location where the appointment is being cancelled must be provided under the Request header.

The following data elements are mandatory (that is, data MUST be present):

- The patient's NHI Number as an identifier (provided under the Search Request)
- The patients ID available under the Payload.
- a Practitioner of the appointment
- the start and end date/time of the appointment.
- the status identifying the appointment as "cancelled".

The following data elements are optional:

- The GUID reference number for the Appointment (ID)
- the slot reference number obtained through the slot/appointment resource retrieval.

2.15 Retrieval of Service Provider Details at a Practice (Practitioner FHIR® Resource)

2.15.1 Search Parameters

Name	Type	Description
identifier	token	**(Mandatory)** The practitioner's identifier number – it can be any one of HPI CPN or NZMC Number.
name	string	A server defined search that may match any of the string fields in the HumanName, including family, give, prefix, suffix, suffix, and/or text
ID	reference	The Unique Resource ID

Please Note- The request header details to be used for the search requests have been provided under section **1.5.3** above.

2.15.2 Request Examples

Please replace [base] with appropriate endpoints for UAT or Production as provided below-

UAT - alexapiuat.medtechglobal.com/FHIR

Production - alexapi.medtechglobal.com/FHIR

Retrieve the entire list of Providers (Practitioner) at a practice

`GET https://[base]/Practitioner/`

Please note: the HPI Facility number of the Location from where the Provider list is being retrieved must be specified under the Header of the request.

Retrieve details of a Provider (Practitioner) at a practice based on the NZMC Number

`GET https://[base]/Practitioner?identifier=https://standards.digital.health.nz/ns/medical-council-id|ABCXXXX`

Retrieve details of a Provider (Practitioner) at a practice based on the HPI CPN

`GET https://[base]/Practitioner?identifier=https://standards.digital.health.nz/ns/hpi-person-id|HPICPNXXXX`

Retrieve details of a Provider (Practitioner) at a practice based on their HPI CPN & Name

`GET https://[base]/Practitioner?identifier=https://standards.digital.health.nz/ns/hpi-person-id|HPICPNXXXX&name=SamEaves`

Retrieve details of a Provider (Practitioner) at a practice based on the Resource ID

```
GET https://[base]/Practitioner?_id=XXXXXXXXXXX
```

Retrieve details of a Provider (Practitioner) at a practice based on the Resource ID (Direct Read)

```
GET https://[base]/Practitioner/XXXXXXXXXXX
```

2.16 Retrieval of Location Details for a Practice (Location FHIR® Resource)

2.16.1 Search Parameters

Please Note- The request header details to be used for the search requests have been provided under section **1.5.3** above.

2.16.2 Request Examples

Please replace [base] with appropriate endpoints for UAT or Production as provided below-

UAT - alexapiuat.medtechglobal.com/FHIR

Production - alexapi.medtechglobal.com/FHIR

Retrieve the single Location details at a practice

`GET https://[base]/Location/`

Please note: the HPI Facility number of the Location from where the Location details is being retrieved must be specified under the Header of the request.

2.17 Retrieval of Patient Details at a Practice (Location FHIR® Resource)

2.17.1 Search Parameters

Name	Type	Description
identifier	token	**(Mandatory)** The patients NHI Number
given	string	A portion of the given name of the patient
family	string	A portion of the family name of the patient
birthdate	date	The patient's date of birth
ID	reference	The unique Resource ID

Please Note- The request header details to be used for the search requests have been provided under section **1.5.3** above.

2.17.2 Request Examples

Please replace [base] with appropriate endpoints for UAT or Production as provided below-

UAT - alexapiuat.medtechglobal.com/FHIR

Production - alexapi.medtechglobal.com/FHIR

Retrieve details of a Patient at a practice based on the patients NHI Number

GET https://[base]/Patient?identifier=https://standards.digital.health.nz/ns/nhi-id|ABC2345

Retrieve details of a Patient at a practice (including Enrolment & Registration details) based on the patients NHI Number

GET https://[base]/Patient?identifier=https://standards.digital.health.nz/ns/nhi-id|ABC2345&_include=Patient:general-practitioner

Retrieve details of a Patient at a practice (including Enrolment & Registration details) based on their Given Name & NHI Number

GET https://[base]/Patient?identifier=https://standards.digital.health.nz/ns/nhi-id|ABC2345&given=Givenname&_include=Patient:general-practitioner

Retrieve details of a Patient at a practice (including Enrolment & Registration details) based on their Family Name & NHI Number

GET https://[base]/Patient?identifier=https://standards.digital.health.nz/ns/nhi-id|ABC2345&family=TestFamily&_include=Patient:general-practitioner

Retrieve details of a Patient at a practice (including Enrolment & Registration details) based on their Date of Birth & NHI Number

GET https://[base]/Patient?identifier=https://standards.digital.health.nz/ns/nhi-id|ABC2345&birthdate=1998-09-09&_include=Patient:general-practitioner

Retrieve details of a Patient at a practice without NHI Number (including Enrolment & Registration details)

GET https://[base]/Patient?family=XXXXXXXX&birthdate=YYYY-MM-DD&telecom=XXXXXXXXX&_include=Patient:general-practitioner

Retrieve details of a Patient at a practice (including Enrolment & Registration details) based on the Resource ID

GET https://[base]/Patient?_id=XXXXXXXX&_include=Patient:general-practitioner

Retrieve details of a Patient at a practice based on the Resource ID (Direct Read)

GET https://[base]/Patient/XXXXXXXX

3 Error Messages

Given below are the error messages that will be displayed if there are issues with the Search Requests-

S.No	Code/Issue Type	Message Text	Area	Reason(s)
01	informational	Request processed successfully.	General	The request is valid and response is successful
02	invalid	Request is invalid.	General	The request does not follow the correct construct
03	not-supported	Request is not supported.	General	The request is not supported
04	not-found	Practice Facility not found.	General	Practice HPI Facility ID not found in Resolution Table
05	not-found	Patient not found.	General	Patient NHI is not found in the PMS of Practice Facility
06	exception	PMS unreachable or unavailable.	General	PMS is not connected or is not responding to request
07	timeout	PMS did not respond to request or has timed out.	General	PMS timed out or ran out of access licenses for the request
08	not-found	Resource ID not found.	General (for all resources that can be searched using resource ID)	The Resource ID resolves to Native Keys that can't be located in the PMS
09	not-found	No information related to Resource ID found.	General (for all resources that can be searched using resource ID)	The Resource ID resolves to Native Keys found in PMS but did not return any data/content

S.No	Code/Issue Type	Message Text	Area	Reason(s)
10	not-found	No available Appointment Slot found for the Service Provider.	Appointment Slot	There is no appointment slot available in the PMS for the Service Provider
11	not-found	No available free Appointment Slot found for the Service Provider.	Appointment Slot	There is no free appointment slot available in the PMS for the Service Provider
12	not-found	No Appointment Slot available for booking.	Appointment Booking	When there is no slot for the requested date/time
13	processing	Appointment Slot is already booked, unable to process the request.	Appointment Booking	When the slot for the date time passed in the request is already booked for another patient
14	not-found	No Appointment Slot available for cancellation.	Appointment Cancellation	When there is no slot for the date time passed in the request
15	processing	Appointment Slot is booked for another Patient, unable to process the request.	Appointment Cancellation	When the slot is booked for a different patient and not the patient for whom the cancellation is requested
16	not-supported	Request for Confidential data is not supported.	Classification	The vendor does not have permission/scope for accessing confidential classifications – This error message will be handled by FHIR® Server.

S.No	Code/Issue Type	Message Text	Area	Reason(s)
17	processing	No Confidential Classifications found for the Patient.	Classification	The request is for retrieval of confidential classifications, but the patient does not have any confidential classifications
18	not-found	No Long Term Classifications found for the Patient.	Classification	The request is for retrieval of Long Term classifications, but the patient does not have any Long Term classifications
19	not-found	No Inactive Classifications found for the Patient.	Classification	The request is for retrieval of inactive classifications, but the patient does not have any inactive classifications
20	not-found	No Classification records found for the Patient	Classification	The patient does not have any classification records available in the Medtech PMS
21	not-supported	Request for Confidential data is not supported.	Medication	The vendor does not have permission/scope for accessing confidential Medications – This error message will be handled by FHIR® Server.
22	not-found	No Confidential Medications found for the Patient.	Medication	The request is for retrieval of confidential Medications, but the patient does not have any confidential Medications
23	not-found	No Long Term Medications found for the Patient.	Medication	The request is for retrieval of Long Term Medications, but the patient does not have any Long Term Medications
24	not-found	No Inactive Medications found for the Patient.	Medication	The request is for retrieval of inactive Medications, but the patient does not have any inactive Medications

S.No	Code/Issue Type	Message Text	Area	Reason(s)
25	not-found	No Medication records found for the Patient.	Medication	The patient does not have any Medication records available in the Medtech PMS
26	not-supported	Request for Confidential data is not supported.	Screening	The vendor does not have permission/scope for accessing confidential screening details – This error message will be handled by FHIR® Server.
27	not-found	No Confidential Screening records found for the Patient.	Screening	The request is for retrieval of confidential screening, but the patient does not have any confidential screening details
28	not-found	No Screening records found for the Patient	Screening	The patient does not have any Screening records available in the Medtech PMS
29				
30	not-supported	Request for Confidential Consultation Notes is not supported.	Consultation Notes/ DocumentReference	The vendor does not have permission/scope for accessing confidential Consultation Notes – This error message will be handled by FHIR® Server.
31	not-found	No Confidential Consultation Notes found for the Patient.	Consultation Notes/ DocumentReference	The request is for retrieval of confidential Consultation Notes, but the patient does not have any confidential Consultation Notes.
32	not-found	No Consultation Notes records found for the patient	Consultation Notes/ DocumentReference	The patient does not have any Consultation Notes records available in the Medtech PMS
33	not-found	No Immunisation records found	Immunisation	There are no Immunisation records available for retrieval within the time frame provided

S.No	Code/Issue Type	Message Text	Area	Reason(s)
		for period requested		
34	not-found	No Immunisation records found for the Patient	Immunisation	The patient does not have any Immunisation records available in the Medtech PMS
35	not-found	No Medical Warning records found for the Patient	Medical Warnings/ Allergy Intolerance	The patient does not have any Medical Warning records available in the Medtech PMS
36	not-found	No Inactive Medical Warning records found for the Patient	Medical Warnings/ Allergy Intolerance	The request is for retrieval of inactive Medical Warning records, but the patient does not have any inactive Medical Warning records
37	not-supported	Request for Confidential data is not supported	Lab Results/ Diagnostic Reports	The vendor does not have permission/scope for accessing confidential Lab Results – This error message will be handled by FHIR® Server.
38	not-found	No Confidential Lab Results found for the Patient	Lab Results/ Diagnostic Reports	The request is for retrieval of confidential Lab Results, but the patient does not have any confidential Lab Results
39	not-found	No Lab Results found for the Patient	Lab Results/ Diagnostic Reports	The patient does not have any Lab Results available in the Medtech PMS
40	not-supported	Request for Confidential data is not supported	Inbox Messages (RSD)/ DocumentReference	The vendor does not have permission/scope for accessing confidential Inbox RSD messages – This error message will be handled by FHIR® Server.
41	not-found	No Confidential Inbox RSD messages	Inbox Messages (RSD)/ DocumentReference	The request is for retrieval of confidential Inbox RSD messages,

S.No	Code/Issue Type	Message Text	Area	Reason(s)
		found for the Patient		but the patient does not have any confidential Inbox RSD messages
42	not-found	No Inbox RSD messages found for the Patient	Inbox Messages (RSD)/ DocumentReference	The patient does not have any Inbox RSD messages available in the Medtech PMS
43	not-found	Patient not found.	Patient	Patient is not found in the PMS of Practice Facility after Non NHI based search using patient demographics data of Family Name, Dob and Mobile – all three have to match.