

Product – Minerva

Document Name – Bulk Export of Patient EHI Data

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1 Summary

The document enables you to export the patient's EHI data in the ndjson format. You can export the EHI data either for a single patient or for all the patients. This functionality can be performed by the Authorised personnel only.

2 Intended Users

Clinical Admin/Admin.

3 Bulk Export

The Bulk Export feature allows data to be exported:

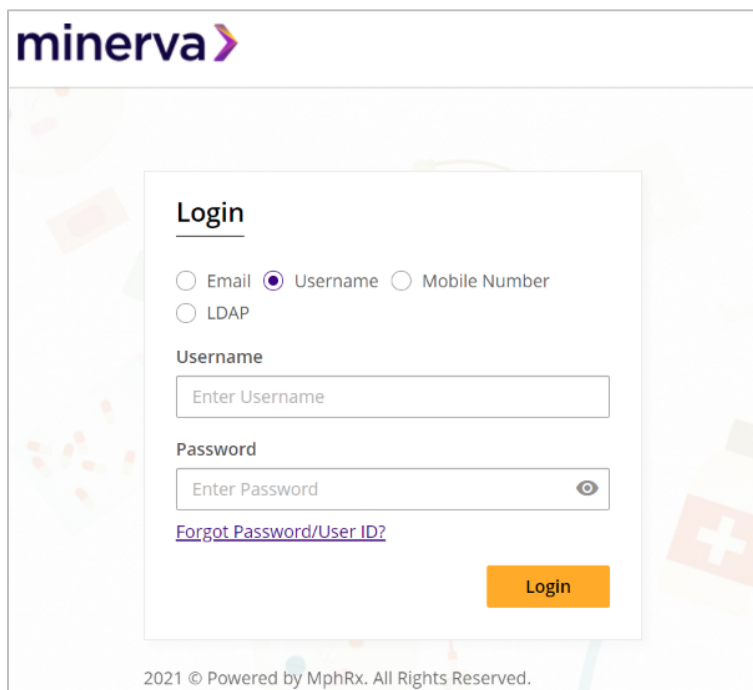
- For a single patient from UI.
- For all patients from the FHIR APIs.

3.1 Bulk Export of Single Patient Data from UI

Actor – Clinical Admin/ Admin (With required permissions/roles)

To export the EHI data for a single patient:

1. Login to the Minerva portal using your credentials. The Patient List page opens.



2. On the Patient List page, search and select the patient whose data you want to export.

The screenshot shows the Minerva Patient List interface. On the left, there is a search sidebar with fields for Name, ID, Phone Number, and Email. The main area displays a table with columns for Identification, Demographics, and Action. Three patients are listed: NEWMAN, alice jones, (Female); LARSON, rebecca jones, (Female); and BATES, jeremy v. jr (Male). The first patient is selected, and the Action dropdown menu is open, showing 'Export EHI' as the first option.

3. Under the Action column, click >> **Export EHI**. The Confirm EHI Export pop-up appears.

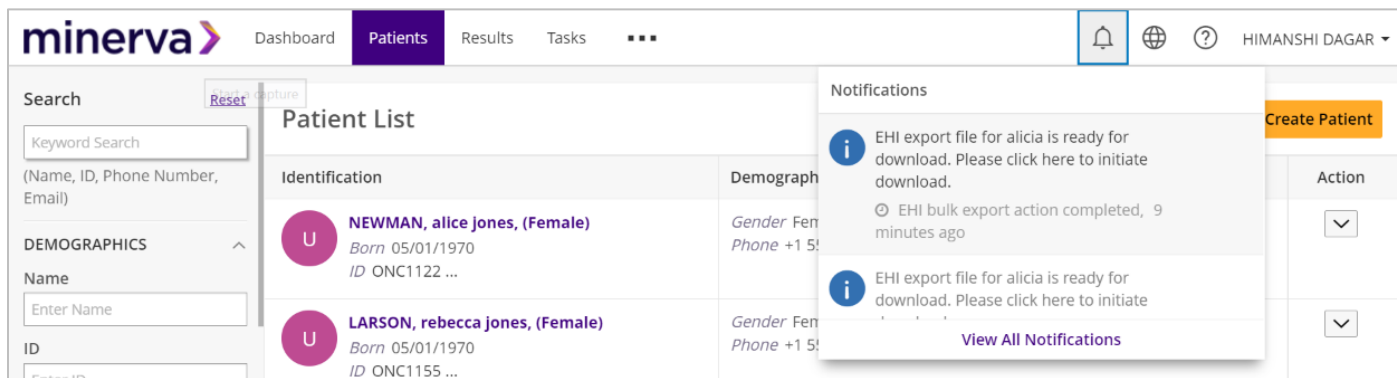
The screenshot shows a purple 'Confirm EHI Export' dialog box. It contains the text: 'Are you sure to initiate EHI Export for NEWMAN, alice jones, (Female)?' At the bottom right, there are two buttons: 'No' and 'Yes'.

4. Click **Yes** to export the data.

The screenshot shows the same Patient List page as before, but with a green notification banner at the top that reads: 'Your request for EHI export has been submitted. We will notify you once the data is ready for export.'

Note: You will receive a notification with a link to download the EHI data for the selected patient.

- In the top navigation bar, click the Notification icon.



- Click the notification, the EHI data in the form of zip file is downloaded to the system.

Note: The Format of the downloaded file is ndjson.

Note: The content of the Downloaded ZIP file will include patient’s EHI and Read Me file. The Read Me file will contain the public URL, which will provide information about the format used to generate the file. Below mentioned are the folders that will be contained in the ZIP file:

ZIP file Content	Content of the Read Me file
	<p>For details of the format about exported files, please refer the following link -</p> <p>https://www.hl7.org/fhir/nd-json.html#:~:text=The%20MIME%2Dtype%20for%20this,resource%20of%20a%20particular%20type.&text=On%20the%20</p>

Sample format of the one of the downloaded ndjson file



allergyintolerance_file_1.ndjson

3.2 Bulk Export of All Patients Data Through FHIR APIs

Request for **All data patient** - [FHIRbase server]/patient/\$export (All patient)

When data is exported, a separate file is created for each resource type. To ensure that the exported files don't become too large. A new file is created after a single file reaches 10,000 lines of record. The result is that you may get multiple files for each resource type, which will be enumerated as (resourcename_file_1.ndjson, resourcename_file_2.ndjson).

To initiate the bulk export, user must first get the access token to access the bulk FHIR APIs.

3.2.1 Get Access Token for Bulk Export

Application uses SMART Backend Services Authorization to secure bulk data request. In each session, the client creates a signed token request using its private key and a client id pre-assigned by the server. The server verifies this request with the client's public key and issues a short-lived access token for use in the API requests. When the access token expires, the process is repeated.

To get the access token a user would have to reach out to MphRx team at ID: techsvc@mphrx.com along with the below details:

- a. Application Name
- b. Scope
- c. Public Key or JWKS URL
- d. Use Case
- e. Email address

MphRx team will share the Client ID, which can be further used to get the access token using API.

Access Token API: <https://<base-url>/minerva/fhir/oauth2/token?provider=idx>

Algorithm Supported: MphRx supports RS384 and ES384 algorithm only.

Request Payload

scope
client_assertion
client_assertion_type
grant_type

Query Parameters

Query Parameter	Optionality	Type	Description
_outputFormat	optional	String	The format for the requested bulk data files to be generated. Defaults to application/fhir%2Bndjson (application/fhir+ndjson).
_since	optional	FHIR instant	Allows you to only export resources that have been modified since the time provided
_type	optional	string of comma-delimited FHIR resource types	Allows you to specify which types of resources will be included. For example, _type=Observation would return only observation resource

Supported Resources

AllergyIntolerance, CarePlan, CareTeam, Condition, Device, DiagnosticReport, DocumentReference, Encounter, Goal, Immunization, Location, Medication, MedicationRequest, Observation, Organization, Patient, Practitioner, PractitionerRole, Procedure, and Provenance.

3.2.2 Access Bulk Export API

A user invokes \$export the operation to initiate the request. This can be done using either an HTTP GET method request with export request parameters:

- <base-url> /minerva/fhir-export/r4/bulkExport/Patient/\$export

Supported Request Header

- Authorization = Bearer {token}
- Accept=application/fhir+json
- Prefer=respond-async

170.315 (b)(10) Electronic Health Information Export

In response to the API the user will receive the Content location URL using which user can further make request to get the status of the latest response of the APIs.

Content Location URL: Indicates the URL that may be used to request an update on the status of the background job.

3.2.3 Error Codes

Status	Description
202	Server has successfully received the request and has scheduled a background job that will assemble the Bulk Export payload.
400	Invalid search parameter
500	Internal Server Error
401	Unauthorized access

Content URL

User can further hit the Content-Location URL to get the below response:

- In progress
- Error
- Complete

Note: If a same request is initiated instead of receiving a new request, you will be given the URL of the previously stored request as per the matching criteria defined below.

Matching Criteria: User ID, Status in Pending or Processing and, Request type (Patient level)

Request Header for Content Status:

- **Authorization:** Bearer {token}
- **Response Body:** OperationOutcome response
- **Response Headers:** Content-Type

Response Header:

- In case of 202 accepted it will receive Content-Location.
- Once the request has been initiated, user can further use the Content Location URL to poll for status request.
- **URL:** <base-url>/minerva/fhir-export/r4/bulkExport/{bulkActionRequestId}

- The Status response can be:
 - InProgress
 - Status e.g., 202 Accepted
 - If status is 202 accepted; X-Progress (In-Progress)

- Error:

Status	Description
500	Internal Server Error
401	Unauthorized access
404	URL Invalid

- **Complete**

When the server has completed fetching the export files, the same content URL request will return a response as mentioned below. The response is a list of files that were fetched by the export job.

Note: For each resource a single unique file will be generated, for a resource if it exceeds of total 10,000 records, a new file will be generated for the same resource.

Sample Response Body for Complete Status: Response Code 200

```
{
  "transactionTime": "2021-04-06T08:26:23.244Z",
  "request": "[base]/Patient/$export?_type=Patient,Observation",
  "requiresAccessToken": true,
  "output": [
    {
      "type": "Patient",
      "url": "<base-url>/MoBulkDownload/downloadNDJSON?objectId=607d41896d70dd22f073459c&resource=Patient&fileName=patient_file_1.ndjson"
    },
    {
      "type": "Patient",
      "url": "<base-url>/MoBulkDownload/downloadNDJSON?objectId=607d41896d70dd22f073459c&resource=Patient&fileName=patient_file_2.ndjson"
    }
  ]
}
```

```

    "type": "Observation",
    "url": "<base-url>/MoBulkDownload/downloadNDJSON?objectId=607d41896d70dd22f073459c&resource=Observation&fileName=observation_file_1.ndjson"
  }
],
"error": [
  {
    "type": "OperationOutcome",
    "url": "/MoBulkDownload/downloadNDJSON?objectId=607d41896d70dd22f073459c&resource=OperationOutcome&fileName=error_file_1.ndjson"
  }
]
}

```

3.2.4 Download the ndjson file

To download the ndjson files, user would need to pass the URL generated in the complete status response along with the access token. If the access token has already expired, user would need to repeat the process to generate the Bulk Export access token.

Request URL: <base-url>/MoBulkDownload/downloadNDJSON?objectId=607d31896d70re22f074459c&resource=OperationOutcome&fileName=error_file_1.ndjson" + Access Token

Request Header: x-auth-token

Error Response:

Status	Description
401	Unauthorized
500	Internal Server Error
403	ATTACHMENT_FILE_NOT_FOUND
400	Bad Request

Note: The URL received in the complete status response will expire in 48 hrs. from the time files are generated. The files will also be auto deleted post 48 hours of time period.

Note: For any URL if pipe Separator (|) is defined, it is required to encode the URL along with the + operator.

Note: The Format of the downloaded file is ndjson.

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Note: For details of the format about exported files, please refer the following link -

<https://www.hl7.org/fhir/nd->

[json.html#:~:text=The%20MIME%2Dtype%20for%20this,resource%20of%20a%20particular%20type.&text=On%20the%20RESTful%20API%2C%20the,retrieved%20using%20the%20Asynchronous%20Pattern](https://www.hl7.org/fhir/nd-json.html#:~:text=The%20MIME%2Dtype%20for%20this,resource%20of%20a%20particular%20type.&text=On%20the%20RESTful%20API%2C%20the,retrieved%20using%20the%20Asynchronous%20Pattern)