

NRDR CDSR Data Exchange

Version 1.0

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NRDR CDSR Data Exchange

# Revision History

|  |  |  |
| --- | --- | --- |
| **Date** | **Version** | **Description** |
| 02/10/2022 | 1.0 | Initial creation |
| 03/24/2023 | 1.0 | Error code CD3003 deleted |
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# CDSR Data Elements

This document describes the CDSR encounter and consultation data elements, JSON schema, NRDR CDSR APIs and error messages. It also demonstrates how to use the authorization token when consuming the NRDR CDSR API.

## CDSR Data Submission

Diagram

Description automatically generated

The diagram below depicts the events that take place in the ACR SSO during the authentication and authorization processes. Please refer to the [*ACR SSO Authentication*](https://nrdrsupport.acr.org/support/solutions/articles/11000090513) *article* for a detailed description of ACR SSO service.

Diagram

Description automatically generated

The NRDR CDSR APIs are a set of REST web services. They return an acknowledgement to the caller when submission is received. It is the responsibility of the caller to capture this acknowledgement to ensure the submission has reached the ACR SSO successfully.

The frequency of the data submission is defined by the partner, however, the ACR prefers the submission to happen more frequent so that the facility/physician will have a faster turnaround time for review.

Partners shall be able to query the status of the submitted transactions by using NRDR CDSR API.

## Data Model

The CDSR data to be submitted to the ACR CDSR NRDR Web API shall be “wrapped” in a transaction. Each transaction has one or more encounter records.

This approach provides the flexibility of submitting multiple encounters for a facility within a single transaction. Note: each transaction shall contain encounters for one facility.

Below is displayed data model for CDSR transaction record.

Table

Description automatically generated

As the data required by CDSR for encounter and consultation record may be coming from different systems within a facility, the CDSR web service will accept transactions with data and merge them into a single encounter and consultation record when the rest of the required data elements arrive in subsequent transactions.

The composite key identifiers of an encounter record:

* Facility ID
* Unique Encounter ID

The composite key identifiers of consultation record:

* Facility ID
* Unique Encounter ID
* CDS Consultation Date
* CDS Consultation Time

For each encounter and consultation record in a transaction the NRDR API will base on its composite key to determine if it should create a new record or update an existing record in the CDSR database. If the composite key is found in the CDSR database the API will update the existing record; otherwise, it will create a new encounter or/and consultation record.

# JSON Schema

To successfully submit transaction, you must provide all required data elements.

## CDSR 1.0 JSON Schema

This schema describes the data elements in a transaction for CDSR file version 1.0:

{

"name": "CDSR\_Encounter\_Transaction",

"Properties": {

"Transaction\_ID": {

"type": "string",

"required": true

},

"Transaction\_DateTime": {

"type": "string",

"required": true

},

"Num\_of\_Encounters\_Included": {

"type": "number",

"required": true

},

"Facility\_ID": {

"type": "string",

"required": true

},

"PartnerID": {

"type": "string",

"required": true

},

"AppID": {

"type": "string",

"required": true

},

"CDSR\_File\_Version\_Num": {

"type": "string",

"required": true

},

"Encounters": {

"type": "array",

"required": true,

"properties": {

"Unique\_Encounter\_ID": {

"type": "string",

"required": true

},

"Patient\_Sex": {

"type": "string",

"required": false

},

"Health\_Insurance": {

"type": "string",

"required": false

},

"Health\_Insurance\_Other\_Spec": {

"type": "string",

"required": false

},

"Clinical\_Scenario\_Codes": {

"type": "string",

"required": false

},

"Clinical\_Scenario\_Descriptions": {

"type": "string",

"required": false

},

"Consultations": {

"type": "array",

"required": true,

"properties": {

"CDS\_Consultation\_Date": {

"type": "string",

"required": true

},

"CDS\_Consultation\_Time": {

"type": "string",

"required": true

},

"Place\_of\_Service": {

"type": "string",

"required": true

},

"Guideline\_Steward": {

"type": "string",

"required": false

},

"Guideline\_Steward\_Other\_Spec": {

"type": "string",

"required": false

},

"Modality": {

"type": "string",

"required": true

},

"Modality\_Other\_Spec": {

"type": "string",

"required": false

},

"Name\_of\_Exam\_Ordered": {

"type": "string",

"required": true

},

"Ordered\_Exam\_Completed": {

"type": "string",

"required": true

},

"Exam\_Completion\_Date": {

"type": "string",

"required": false

},

"Appropriateness\_Category": {

"type": "string",

"required": false

},

"Appropriateness\_Category\_Other\_Spec": {

"type": "string",

"required": false

},

"CDS\_Vendor": {

"type": "string",

"required": true

},

"CDS\_Vendor\_Other\_Spec": {

"type": "string",

"required": false

},

"Medicare\_Modifier": {

"type": "string",

"required": false

},

"Clinician1\_Unique\_ID": {

"type": "string",

"required": false

},

"Clinician1\_Role": {

"type": "string",

"required": false

},

"Clinician1\_Role\_Other\_Spec": {

"type": "string",

"required": false

},

"Clinician1\_First\_Name": {

"type": "string",

"required": false

},

"Clinician1\_Last\_Name": {

"type": "string",

"required": false

},

"Clinician1\_Training": {

"type": "string",

"required": false

},

"Clinician1\_Training\_Other\_Spec": {

"type": "string",

"required": false

},

"Clinician1\_Medical\_Specialty\_Code": {

"type": "string",

"required": false

},

"Clinician2\_Unique\_ID": {

"type": "string",

"required": false

},

"Clinician2\_Role": {

"type": "string",

"required": false

},

"Clinician2\_Role\_Other\_Spec": {

"type": "string",

"required": false

},

"Clinician2\_First\_Name": {

"type": "string",

"required": false

},

"Clinician2\_Last\_Name": {

"type": "string",

"required": false

},

"Clinician2\_Training": {

"type": "string",

"required": false

},

"Clinician2\_Training\_Other\_Spec": {

"type": "string",

"required": false

},

"Clinician2\_Medical\_Specialty\_Code": {

"type": "string",

"required": false

},

}

}

}

}

## CDSR JSON Mapping Specification

The *CDSR\_JSON\_Mapping\_<version>.xlsx* document describes the validation rules and format of the JSON data elements. Most of the values of the data elements are mapped to either numeric or alpha-numeric codes. The data elements that have a ‘Required’ or ‘Conditionally Required’ under the “Required to submit a transaction” column are the minimum set of the data elements that you need to provide in order to create a “skeleton” record in the database.

The data elements that are marked as “Optional” under the “Required to submit a transaction” column are not required for submission, that is, a record will not be rejected if an optional field is missing. However, if you do know them, we expect you to provide them. This expectation of complete data is specified in the participation agreement signed by all participating facilities.

## NRDR Web Service Status Schema

NRDR web service transaction status schema describes the data elements and the validation statuses of a transaction, and the exams associated with it.

Parameters: transaction\_id, partner\_id and app\_id initiated by the partner.

You will use the GET request to query the error encountered during the submission process.

Note: the value of the **Error\_Msg** attribute consists of multiple error messages that occurred while validating a transaction. Each message contains the error code-message pair. Messages are separated by the ‘|’ delimiter.

For example:

CD2001:Missing Transaction\_ID|CD2011:Missing Transaction\_DateTime

CDSR Exam Transaction Status Schema:

{

"name": "CDSR\_Exam\_Transaction\_Status",

"Properties": {

"Transaction\_ID": {

"type": "string",

"required": true

},

"Transaction\_DateTime": {

"type": "string",

"required": true

},

"Num\_of\_Exam\_Included": {

"type": "number",

"required": true

},

"Num\_of\_Exam\_In\_Error": {

"type": "number",

"required": true

},

"PartnerID": {

"type": "string",

"required": true

},

"AppID": {

"type": "string",

"required": true

},

"Facility\_ID": {

"type": "string",

"required": true

},

"Status": {

"type": "string",

"required": true

},

"Error\_Msg": {

"type": "string",

"required": false

},

"Exam\_Errors": {

"type": "array",

"required": true,

"properties": {

"Exam\_Unique\_ID”: {

“type”: “string”,

“required”: false

},

"Error\_Msg": {

"type": "string",

"required": true

}

}

}

}

}

### Transaction Statuses

The following transaction status is possible:

* **Enqueued** – Transaction has been placed in queue and awaiting to be loaded
* **Received** – Transaction has been received and is pending for validation
* **ValidationFail** – Nothing got loaded. Failed at exam processing
* **ValidationSuccessful** – Validation has complete, pending for loading into database
* **Loading** – Data is loading, transaction is being created
* **Posted** – The entire transaction is loaded successfully
* **PartiallySuccessful** – Some elements are loaded and some are rejected
* **Failed** – Transaction failed to be created due to an error

## NRDR Web Service Error Response Schema

NRDR transaction web service error responseschema describes detailed error information which is returned by all API responses with a status code other than 200:

{

"name": "CDSR\_WebService\_Error",

"Properties": {

"error\_code": {

"type": "string",

"required": true

},

"error\_description": {

"type": "string",

"required": true

}

}

# NRDR Transaction API

## Test Environment

Base URL: <https://nrdr9x.acr.org/NonPQRSapi/cdsr/transactions>

Application ID: 10019

Partner ID: to be provided

Facility ID: to be provided

## Authentication

To be able to call API you must add JWT token received from ACR SSO to the “Authorization” request header using the following format:

Bearer <jwt-token>

Responses with a status code 401 indicate errors related to the authentication. Following error codes are used to provide more detailed error:

* ‘invalid\_token’, token is invalid or expired
* ‘missing\_token’, token is not provided in the request header

To be able to call API you must add JWT token received from ACR SSO to the “Authorization” request header using the following format:

Bearer <jwt-token>

Responses with a status code 401 indicate errors related to the authentication. The following error codes are used to provide more detailed error information:

* `invalid\_token`, token is invalid or expired
* `missing\_token`, token is not provided in the request header

## Create or Update Transaction

**POST**

POST request is used to upload a new set of CDSR data. It allows you to resubmit the transaction if data contains ID of the already submitted transaction. Otherwise, it creates a new transaction.

Acceptable request representations:

* application/json

Possible responses:

* 200, returned when transaction data is uploaded and transaction is created successfully,
* 400, content-type: application/json
  + error\_code = ‘data\_error’

Transaction data is missing or doesn’t have valid JSON representation

* 403, content-type: application/json
  + error\_code = ‘no\_permission’

Authenticated user doesn’t have permissions to upload transaction data for a given facility

### Examples POST

Creating transaction:

Sample parameters:

Facility\_ID: "100000"

PartnerID: "10000"

AppID: "10019"

Authorization: “Bearer eyJ0eXAiOiJKV1QiLCJhbGciOiJodHRwOi8vd3d3LnczLm9yZy8yMDAwLzA5L3htbGRzaWcjcnNhLXNoYTEiLCJ4NXQiOiIzWndDNC15STBQQmNHeDAyWlNsQjdaa1NRLUUifQ.eyJpc3MiOiJodHRwczovL1NlY3VyZUF1dGgwMVZNLmFjci5vcmciLCJhdWQiOiJodHRwczovL1NlY3VyZUF1dGgwMVZNLmFjci5vcmciLCJuYmYiOjE0MjIyNzY3ODIsImV4cCI6MTQyMjM2MzE4MiwiY2xpZW50X2lkIjoiMWY1ZjM5NTI0ZjIyNGRmMDg0NTIwYTJmYWE5YTkyNzUiLCJzY29wZSI6WyJvcGVuaWQiLCJwcXJzIl0sInN1YiI6IjEwMDAwMF9udWFuY2UiLCJhbXIiOiJwYXNzd29yZCIsImF1dGhfdGltZSI6IjE0MjIyNzY3NTciLCJpZHAiOiJTZWN1cmVBdXRoNSJ9.AFsoPNtIT8N0N6w1y0OZLokdplfRM2Y8OAvquMXpkoI\_6b9ANEhXY72ubuylt6-4vdJ165aVUXPRDTF37UT9cqv21hRTpOfYYM0tV5gksUbvLzKaPFt6EWbB8ctQnHs1pxyDGSbKDM-dR6upj6x0eZ7O46Zwi8o8Zhkeu0bFZPNmLS7y96\_A9uyGBkbt69Ih0aCBNRvtabqkD3vJsWB4EIfiqJJ2RO8XPCGfSoYAnuosgH5Cm6kMNN7WiX4rgFps20MryBLtutKztcNhaj-l65gzxyrJpgmq8r9dBWiFI6nFc-rKkNr6Gdj2TH9EABloC6aO\_CQQFtgrXFLEchnSPw”

**Note**: the authentication/authorization mechanism in the CDSR API adopts the ACR SSO security model which requires an authorization token after authenticated successfully. The token in the sample parameters above is an example.

function createTransaction(transactionData, token) {

    $.ajax({

        type: 'POST',

        url: "https://nrdr9x.acr.org/NonPQRSapi/cdsr/transactions",

        data: JSON.stringify(transactionData),

        dataType: "json",

        contentType:"application/json; charset=utf-8",

        headers: { "Authorization": "Bearer " + token },

        success: function (data) {

            // handle data load success

        }

    });

}

This function can be used the following way:

var transactionJsonData =

{

Transaction\_ID: "cdsr-334",

Transaction\_DateTime: "03/04/2022",

Num\_of\_Encounters\_Included: "1",

Facility\_ID: "100000",

PartnerID: "10000",

AppID: "10019",

CDSR\_File\_Version\_Num: "1.0",

"Encounters": [

{

Unique\_Encounter\_ID: "encounter 8",

Patient\_Sex: "M",

Health\_Insurance: "1,2,3,4,5,6,7",

Health\_Insurance\_Other\_Spec: "other",

Clinical\_Scenario\_Codes: "code1,code2",

Clinical\_Scenario\_Descriptions: "decription of code 1, description of code 2",

"Consultations": [

{

CDS\_Consultation\_Date: "03/03/2022",

CDS\_Consultation\_Time: "15:08:33",

Place\_of\_Service: "99",

Guideline\_Steward: "1" ,

Guideline\_Steward\_Other\_Spec: null,

Modality: "88",

Modality\_Other\_Spec: "other modality",

Name\_of\_Exam\_Ordered: "ordered exam1",

Ordered\_Exam\_Completed: "4",

Exam\_Completion\_Date: "01/01/2022",

Appropriateness\_Category: "1",

Appropriateness\_Category\_Other\_Spec: "null",

CDS\_Vendor: "G1014",

CDS\_Vendor\_Other\_Spec: null,

Medicare\_Modifier: "ME",

Clinician1\_Unique\_ID: "clinician unique1",

Clinician1\_Role: "88",

Clinician1\_Role\_Other\_Spec: "other role",

Clinician1\_First\_Name: "First",

Clinician1\_Last\_Name: "Last",

Clinician1\_Training: "88",

Clinician1\_Training\_Other\_Spec: "other training",

Clinician1\_Medical\_Specialty\_Code: "999",

Clinician2\_Unique\_ID: "clinician unique2",

Clinician2\_Role: "99",

Clinician2\_Role\_Other\_Spec: null,

Clinician2\_First\_Name: "First Two",

Clinician2\_Last\_Name: “Last Two",

Clinician2\_Training: "99",

Clinician2\_Training\_Other\_Spec: null,

Clinician2\_Medical\_Specialty\_Code: "20",

}

]

}

]

}

//Get ACR SSO Token

var token = GetAuthorizationToken();

createTransaction(transactionData, token);

## Get Transaction Status

**GET**

GET request is used to get a transaction JSON object for a single transaction.

Possible responses:

* 200, content-type: application/json

Response will contain JSON data according to NRDR web service status schema

* 400, content-type: application/json
  + error\_code = ‘missing\_param’

Indicates a missing transaction ID parameter

* 404, content-type: application/json
  + error\_code = ‘invalid\_param’

Indicates that transaction with a given ID doesn’t exist

### Examples GET

Getting transaction status:

For test use the following values:

https://nrdr9x.acr.org/NonPQRSapi/cdsr/transactions?id=<transaction id>

&facilityid=<facility id>&partnerid=<partner id>&appid=<app id>

Sample parameters:

id: “26”     (transaction id)

       FacilityID: "100000"

       PartnerID: "10000"

       AppID: "10019"

**Note**: the authentication/authorization mechanism in the CDSR API adopts the ACR SSO security model which requires an authorization token after authenticated successfully.

function getTransaction(transactionId, token, partnerId, appId, facilityId) {

    $.ajax({

        type: 'GET',

        url: "https://nrdr9x.acr.org/NonPQRSapi/cdsr/transactions",

        data: { "id": transactionId, "appid": appId, "partnerid":

partnerId,"facilityid": facilityId },

        headers: { "Authorization": "Bearer " + token },

        success: function (data) {

            // handle JSON with transaction data

        }

    });

}

JSON response example:   
{

"Transaction\_ID": "26",

"Transaction\_DateTime": "2023-02-02T00:00:00",

"Num\_of\_Exam\_Included": 1,

"Num\_of\_Exam\_In\_Error": 0,

"PartnerID": 10000,

"AppID": 10019,

"Facility\_ID": "100000",

"Error\_Msg": "",

"Exam\_Errors": [

{

"Exam\_Unique\_ID": "",

"Error\_Msg": "CD2070:Invalid. Missing encounter object information"

}

],

"Status": "Posted"

}

# Validation & Error Messages

The Validator will validate the following:

1. JSON syntax
2. Required fields
3. Response value of the data elements based on the business rules stated in the *CDSR JSON Mapping\_<version>.xlsx*.

The table below lists the possible messages generated by the validator during the validation process for a transaction:

|  |  |  |
| --- | --- | --- |
| **Error Code** | **Error** | **Error Message** |
| CD0000 | TransactionReceived | Transaction is loaded successfully |
| CD0001 | TransactionPending | Transaction has been received and is pending for validation |
| CD0002 | TransactionLoading | Validation has been completed, pending for loading to database |
| CD0003 | TransactionLoadedPartially | Transaction was partially loaded. Some elements did not pass validation and were rejected. |
| CD0004 | TransactionRejected | The entire transaction was rejected due to failure in validation |
| CD0005 | TransactionReplaced | This transaction has been replaced with another transaction |
| CD1003 | DataDoesNotMatchSchema | Unable to import data submitted. Data does not match schema |
| CD1004 | DataIsEmpty | Unable to import data submitted. Data is empty or null |
| CD1005 | OtherDataError | Error importing data <exception message> |
| CD1010 | UserNotAuthorized | User account is not authorized to submit data to CDSR for the facility ID |
| CD1012 | PartnerNotAuthorizedForFacilityApplication | Partner <Partner ID> is not authorized to submit data for facility <facility ID> and/or application <application> |
| CD2001 | TransactionIdMissing | Missing Transaction\_ID |
| CD2002 | TransactionIdInvalid | Invalid Transaction\_ID. Maximum length is 50 characters |
| CD2011 | TransactionDateTimeMissing | Missing Transaction\_DateTime |
| CD2012 | TransactionDateTimeInvalidFormat | Transaction\_DateTime is not a valid date time format |
| CD2013 | TransactionDateTimeFuture | Transaction\_DateTime is a future date |
| CD2014 | TransactionIdMustBeUnique | Transaction\_ID must be unique. <transaction\_id> has been submitted in a previous transaction |
| CD2023 | NumOfEncountersIncludedMissing | Missing Num\_of\_Encounters\_Included |
| CD2024 | NumOfEncountersIncludedInvalidFormat | Num\_of\_Encounters\_Included is not an integer |
| CD2031 | PartnerIdMissing | Missing PartnerID |
| CD2032 | PartnerIdInvalid | Invalid PartnerID |
| CD2041 | AppIdMissing | Missing AppID |
| CD2042 | AppIdInvalid | Invalid AppID |
| CD2051 | FacilityIdMissing | Missing Facility\_ID |
| CD2052 | FacilityIdInvalid | Invalid Facility\_ID |
| CD2053 | FacilityNotRegistered | Facility has not registered for CDSR. Submission aborted |
| CD2054 | FacilityNotAccepted | Facility has not been accepted to CDSR. Submission aborted |
| СD2062 | FacilityNotAccessible | Invalid FacilityID. User has no access permission to the registry of the facility. |
| CD2070 | EncountersMissing | Missing encounter object information |
| CD2074 | EncountersIncludedNumberIncorrect | Num\_of\_Encounters\_Included {0} does not match with encounters records received {1} |
| CD2075 | ConsultationsMissing | Missing consultations object information |
| CD2080 | EncountersPartiallyRejected | Some of the encounters did not pass validation and were rejected |
| CD2090 | HasUnknownFieldsInvalid | Transaction has unknown element(s): <unknown\_elements\_list> |
| CD2091 | HasForbiddenSymbolInFieldsInvalid | Forbidden symbol ‘|’ in field(s): <fields\_names> |
| CD3000 | FieldsCountInvalid | Invalid record. {0} entries expected. {1} read. |
| CD3001 | FieldMissing | Invalid. Required field is missing {0} |
| CD3002 | FieldNotApplicableInvalid | Invalid. {0} is only applicable, if {1} is {2}. Otherwise, should be blank |
|  |  |  |
| CD3004 | FieldNotApplicableReportedInvalid | Invalid. {0} is only applicable, if {1} is reported. Otherwise, should be blank |
| CD3005 | FieldRequiredInvalid | Invalid. {0} is required, if {1} is {2} |
| CD3006 | FieldRequiredNotReportedInvalid | Invalid. {0} is required, if {1} is not reported |
| CD3007 | FieldRequiredReportedInvalid | Invalid. {0} is required, if {1} is reported |
| CD3020 | FieldFormatInvalid | Invalid {0} format |
| CD3030 | UniqueWithinArrayInvalid | Invalid {0}. Values should be unique within array |
| CD3031 | MaximumArrayLengthInvalid | Invalid {0}. Maximum array length is {1} elements |
|  |  |  |
| CD2102 | VersionNumberInvalid | Invalid file version number |
| CD3041 | VersionNumberNotSupported | Version number is not supported |
| CD3042 | VersionNumberMissing | Invalid. Missing version number |
| CD3060 | DateInvalidFormat | Invalid {0} format. Valid format is mm/dd/yyyy or m/d/yyyy |
| CD3061 | TimeInvalidFormat | Invalid {0} format. Valid format is hh:mi:ss in military format |
| CD3110 | CharacterLengthInvalid | Invalid {0}. Maximum character length is {1} character(s) |
| CD3111 | NumericFieldInvalid | Invalid {0}. Field must contain only the characters 0-9 |
| CD3120 | SelectionFieldInvalid | Invalid {0}. Values {1} expected |
| CD3130 | DateInvalid | Invalid {0}. Date must be greater than 1/1/2000 and less than or equal to the current date |
| CD3240 | OptionsCannotBeSelectedInvalid | Invalid. For {0} invalid options selected. If 'Unknown' option selected, then no other options can be selected |
| CD3300 | SeparatorsCountInvalid | Invalid. "Clinical scenario codes" and "Clinical scenario descriptions” fields must have the same number of separators (i.e. commas) |