

How to Query the XNAT Search Engine with REST API

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Get All MR Sessions In The OASIS Cross-Sectional Study

The XNAT search engine can be queried via the REST API. Here's a quick demonstration using XNAT Central. First, you will need a sample search xml:

```

<?xml version="1.0" encoding="UTF-8"?>
<xdat:search ID="" allow-diff-columns="0" secure="false" brief-description="MR Sessions"
  xmlns:xdat="http://nrg.wustl.edu/security" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">
  <xdat:root_element_name>xnat:mrSessionData</xdat:root_element_name>
  <xdat:search_field>
    <xdat:element_name>xnat:mrSessionData</xdat:element_name>
    <xdat:field_ID>LABEL</xdat:field_ID>
    <xdat:sequence>0</xdat:sequence>
    <xdat:type>string</xdat:type>
    <xdat:header>MR ID</xdat:header>
  </xdat:search_field>
  <xdat:search_field>
    <xdat:element_name>xnat:subjectData</xdat:element_name>
    <xdat:field_ID>LABEL</xdat:field_ID>
    <xdat:sequence>1</xdat:sequence>
    <xdat:type>string</xdat:type>
    <xdat:header>Subject</xdat:header>
  </xdat:search_field>
  <xdat:search_field>
    <xdat:element_name>xnat:mrSessionData</xdat:element_name>
    <xdat:field_ID>AGE</xdat:field_ID>
    <xdat:sequence>2</xdat:sequence>
    <xdat:type>integer</xdat:type>
    <xdat:header>Age</xdat:header>
  </xdat:search_field>
  <xdat:search_field>
    <xdat:element_name>cnda:clinicalAssessmentData</xdat:element_name>
    <xdat:field_ID>NEURO_CDR_RATING</xdat:field_ID>
    <xdat:sequence>3</xdat:sequence>
    <xdat:type>string</xdat:type>
    <xdat:header>CDR</xdat:header>
  </xdat:search_field>
  <xdat:search_field>
    <xdat:element_name>cnda:clinicalAssessmentData</xdat:element_name>
    <xdat:field_ID>NEURO_MMSE</xdat:field_ID>
    <xdat:sequence>4</xdat:sequence>
    <xdat:type>string</xdat:type>
    <xdat:header>MMSE</xdat:header>
  </xdat:search_field>
  <xdat:search_field>
    <xdat:element_name>xnat:subjectData</xdat:element_name>
    <xdat:field_ID>GENDER</xdat:field_ID>
    <xdat:sequence>5</xdat:sequence>
    <xdat:type>string</xdat:type>
    <xdat:header>M/F</xdat:header>
  </xdat:search_field>
  <xdat:search_where method="OR">
    <xdat:criteria override_value_formatting="0">
      <xdat:schema_field>xnat:mrSessionData/sharing/share/project</xdat:schema_field>
      <xdat:comparison_type>=</xdat:comparison_type>
      <xdat:value>CENTRAL_OASIS_CS</xdat:value>
    </xdat:criteria>
    <xdat:criteria override_value_formatting="0">
      <xdat:schema_field>xnat:mrSessionData/PROJECT</xdat:schema_field>
      <xdat:comparison_type>=</xdat:comparison_type>
      <xdat:value>CENTRAL_OASIS_CS</xdat:value>
    </xdat:criteria>
  </xdat:search_where>
</xdat:search>

```

This search queries for all **mrSessionData** objects that are owned by the **CENTRAL_OASIS_CS** project or shared into the **CENTRAL_OASIS_CS** project.

- The **<xdat:root_element_name>** determines which data type you are returning. There will be one row per matching entry of this type.
- You can add fields from other data types using **<xdat:search_field>** elements. You can put any XNAT xsiTypes into the **<xdat:element_name>** field. The field_ID must match a **<DisplayField>** in the display documents for that data-type.
- The search criteria can reference either display fields from the display documents, or schema fields themselves using XPATH.

You can retrieve the search results for this search by performing a POST of this document to `/data/archive/search`. You can customize the format of the results using the `format=xml, csv, html, json` querystring variable. The xml can be posted in the BODY of your HTML message, or attached as a separate file.

To test this:

- Download this XML file: [central_all_OASIS_MRS.xml](#)
- Open a terminal window and type this command:

Terminal

```
$ curl -X POST -u user:password https://central.xnat.org/data/search?format=xml -F "file=@central_all_OASIS_MRS.xml"
```

Get A Filtered List Of MR Scans From XNAT Central

Here is a second, more interesting search, which gets all of the MR sessions which your account has access to WHERE the DERIVED_AGE is > 90 and the session contains at least one MPRAGE scan.

Download XML Search File: [central_all_sessions_with_MPRAGE_by_type.xml](#)

```
<?xml version="1.0" encoding="UTF-8"?>
<xdat:search ID="" allow-diff-columns="0" secure="false" brief-description="MR Sessions" xmlns:cnda="
http://nrg.wustl.edu/cnda" xmlns:arc="http://nrg.wustl.edu/arc" xmlns:pipe="http://nrg.wustl.edu/pipe" xmlns:
fs="http://nrg.wustl.edu/fs" xmlns:wrk="http://nrg.wustl.edu/workflow" xmlns:xdat="http://nrg.wustl.edu
/security" xmlns:cat="http://nrg.wustl.edu/catalog" xmlns:prov="http://www.ncbi.nlm.nih.gov/prov" xmlns:xnat="
http://nrg.wustl.edu/xnat" xmlns:xnat_a="http://nrg.wustl.edu/xnat_assessments" xmlns:xsi="http://www.w3.org
/2001/XMLSchema-instance" >
  <xdat:root_element_name>xnat:mrSessionData</xdat:root_element_name>
  <xdat:search_field>
    <xdat:element_name>xnat:mrSessionData</xdat:element_name>
    <xdat:field_ID>LABEL</xdat:field_ID>
    <xdat:sequence>0</xdat:sequence>
    <xdat:type>string</xdat:type>
    <xdat:header>MR ID</xdat:header>
  </xdat:search_field>
  <xdat:search_field>
    <xdat:element_name>xnat:subjectData</xdat:element_name>
    <xdat:field_ID>LABEL</xdat:field_ID>
    <xdat:sequence>2</xdat:sequence>
    <xdat:type>string</xdat:type>
    <xdat:header>Subject</xdat:header>
  </xdat:search_field>
  <xdat:search_field>
    <xdat:element_name>xnat:mrSessionData</xdat:element_name>
    <xdat:field_ID>AGE</xdat:field_ID>
    <xdat:sequence>3</xdat:sequence>
    <xdat:type>integer</xdat:type>
    <xdat:header>Age</xdat:header>
  </xdat:search_field>
  <xdat:search_where method="AND" >
    <xdat:criteria override_value_formatting="0" >
      <xdat:schema_field>xnat:mrSessionData/GEN_AGE</xdat:schema_field>
      <xdat:comparison_type>></xdat:comparison_type>
      <xdat:value>90</xdat:value>
    </xdat:criteria>
    <xdat:criteria override_value_formatting="0" >
      <xdat:schema_field>xnat:mrSessionData/scans/scan/type</xdat:schema_field>
      <xdat:comparison_type>=</xdat:comparison_type>
      <xdat:value>MPRAGE</xdat:value>
    </xdat:criteria>
  </xdat:search_where>
</xdat:search>
```

Build Your Own Search Filter With Element Queries

You can use either example XML file as a starting point for your search. For a list of the available data types you can use in your searches, use this query:

Terminal Window

```
$ curl -u user:password http://central.xnat.org/data/archive/search/elements?format=csv
```

This will return a CSV formatted list of xsiTypes that can be queried in XNAT Central. Using the returned xsiType names, you can retrieve the fields for the data types of interest.

Terminal Window

```
$ curl -u user:password http://central.xnat.org/data/archive/search/elements/xnat:mrSessionData?format=csv
```