

How to Edit, Filter, and Join Data Tables

Once you have a table of data, as an output of a search or a listing, XNAT provides you with several tools to either expand or narrow down your search results.



To expand your search and cross-reference against another data type, you can **Join** your data table with another data type. See below.

Sorting Data Tables

I have created a stored search on XNAT Central that joins APARC data with Clinical evaluations, just to have something to work with. Let's say, in this example, that I want to sort my data by MMSE scores, descending from the highest. A simple left-click on the column header brings up a contextual menu that allows me to do just that.

The screenshot shows a search results table with the following columns: ID, Label, Subject, Diff, BP, SBT, MMSE, CDR, Sum Boxes, STROKE, and High. A contextual menu is open over the MMSE column header, showing options: Sort Up, Sort Down (highlighted), Hide Column, Edit Column, and Filter. The table contains 22 rows of data, with MMSE scores ranging from 22 to 30. The table is displayed on page 1 of 22 pages (423 rows total).

ID	Label	Subject	Diff	BP	SBT	MMSE	CDR	Sum Boxes	STROKE	High
	OAS1_0074_MR1_APARC_LH	OAS1_0074								
	OAS1_0073_MR1_APARC_LH	OAS1_0073								
	OAS1_0368_MR2_APARC_LH	OAS1_0368								
	OAS1_0423_MR1_APARC_LH	OAS1_0423				26	0.0			
	OAS1_0083_MR1_APARC_LH	OAS1_0083				27	0.0			
	OAS1_0376_MR1_APARC_LH	OAS1_0376								
	OAS1_0019_MR1_APARC_LH	OAS1_0019				30	0.0			
	OAS1_0316_MR1_APARC_LH	OAS1_0316				22	1.0			
	OAS1_0136_MR1_APARC_LH	OAS1_0136								
	OAS1_0358_MR1_APARC_LH	OAS1_0358				29	0.0			
	OAS1_0057_MR1_APARC_LH	OAS1_0057								
	OAS1_0354_MR1_APARC_LH	OAS1_0354				26	0.0			
	OAS1_0181_MR1_APARC_LH	OAS1_0181				30	0.0			
	OAS1_0420_MR1_APARC_LH	OAS1_0420								
	OAS1_0112_MR1_APARC_LH	OAS1_0112				29	0.0			
	OAS1_0018_MR1_APARC_LH	OAS1_0018				28	0.0			
	OAS1_0378_MR1_APARC_LH	OAS1_0378				30	0.0			

However, the resulting data table doesn't look right - because I have a set of NULL data floating to the top of my list. To fix this, I will need to filter this data table.

Search 1 ✕

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ID	Label	Subject	Diff	BP	SBT	MMSE	CDR	Sum Boxes	STROKE	High
	OAS1_0004_MR1_APARC_LH	OAS1_0004								
	OAS1_0005_MR1_APARC_LH	OAS1_0005								
	OAS1_0007_MR1_APARC_LH	OAS1_0007								
	OAS1_0009_MR1_APARC_LH	OAS1_0009								
	OAS1_0012_MR1_APARC_LH	OAS1_0012								
	OAS1_0014_MR1_APARC_LH	OAS1_0014								
	OAS1_0017_MR1_APARC_LH	OAS1_0017								
	OAS1_0025_MR1_APARC_LH	OAS1_0025								
	OAS1_0027_MR1_APARC_LH	OAS1_0027								
	OAS1_0029_MR1_APARC_LH	OAS1_0029								
	OAS1_0037_MR1_APARC_LH	OAS1_0037								
	OAS1_0038_MR1_APARC_LH	OAS1_0038								
	OAS1_0040_MR1_APARC_LH	OAS1_0040								
	OAS1_0043_MR1_APARC_LH	OAS1_0043								
	OAS1_0045_MR1_APARC_LH	OAS1_0045								
	OAS1_0047_MR1_APARC_LH	OAS1_0047								
	OAS1_0049_MR1_APARC_LH	OAS1_0049								

Filtering Data by Column

To exclude NULL entries in the MMSE scores from this data table, I need to create a filter. Clicking on the column header brings my contextual menu back, and I select "Filter".

Search 1 x

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ID	Label
OAS1_0004_M	
OAS1_0005_M	
OAS1_0007_M	
OAS1_0009_M	
OAS1_0012_M	
OAS1_0014_M	
OAS1_0017_M	
OAS1_0025_M	
OAS1_0027_M	
OAS1_0029_M	
OAS1_0037_M	
OAS1_0038_M	
OAS1_0040_M	
OAS1_0043_M	
OAS1_0045_M	
OAS1_0047_M	
OAS1_0049	MR1 APARC LH OAS1_0049

Results Filter

Clinical Assessment MMSE

SELECT More...

SELECT
=
>
>=
<
<=
!=
IN
BETWEEN
IS NULL
IS NOT NULL

Submit Cancel

In the Filter dialog, I can select from a number of mathematical operators, including IS NOT NULL. Creating this filter immediately narrows down my search, and brings the data I want to the top of the table.

In the table header, you will see the filter noted: Filter(s): MMSE IS NOT NULL

Removing Data Filters

Removing an established filter is easy. Simply click on the column header that has a filter applied to bring the filter dialog back up. Clicking on the Trashcan icon will remove that filter from that data set.

MR Session Date

🗑️ (xnat:mrSessionData.DATE > 2012-01-01)

OR

SELECT More...

Filtering Tip: "AND" vs "OR" filters

If you place a filter on multiple columns of data, you can quickly narrow down your search results even further. For example, this table has three different column filters applied, which has narrowed an original data set of nearly 500 rows down to a 33-row data set.

You can see the filters specified in the table header:

Filter(s): (MMSE IS NOT NULL) AND (NumVert > 130000) AND (rating = 0.0)

These filters work in combination as "AND" filters, where the only data sets that are displayed are those that meet all three conditions. However, **placing multiple filters on a single column of data does not work like this**. For example, if I wanted to show only MMSE scores between 14 and 20, I would like to apply two filters like the following:

- MMSE <= 20
- MMSE >= 14

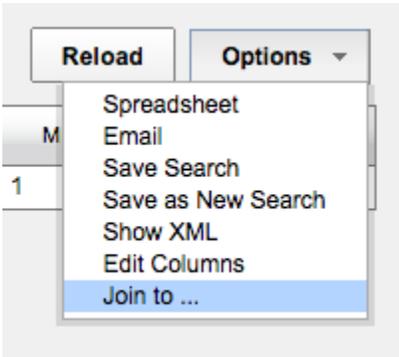
However, these filters combine as "OR" filters, which gives me a data set where rows are **either less than 20 OR greater than 14** ... which returns my entire set of non-NULL data. This is a known issue that may be addressed in future versions of XNAT.

Joining Data Tables

An [Advanced Search](#) starts with a root, or "pivot," data type and joins it to other data types.

 For consistency with naming in XNAT, we will call this a "pivot" data type, although this is a loaded term in data mining.

You can produce the same effect from any given data table, such as a [data type report](#), by selecting **Options > Join**. This will allow you to join your current data table with a new data type.



Suppose you select **MR Session** as your pivot data type. Your report format begins with a single row of data for every MR session that you have permission to see.

This means: If a subject does not have an MR session, *you will not see any data for that subject in this report*. For some searches (i.e. "Create a clinical comparison for all subjects that have scan data") that is ideal. For others ("Show me the project protocol and highlight subjects that are missing MR Sessions") this is not going to work.

Search 1 x

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Label	Project	Date	M/F	Age	Gender	Subject	Hand	YOB	Education	Ses
ResultsSbj01	100RunsPerSubj		U							
1	ADHD200		U			9956994				
50782592_BWH	Calib	2009-01-01	M	45	male	50782592	right	1964	21	
50782592_DUKE	Calib	2009-01-01	M	45	male	50782592	right	1964	21	
50782592_DUKE2	Calib	2009-01-01	M	45	male	50782592	right	1964	21	
50782592_MGH	Calib	2009-01-01	M	45	male	50782592	right	1964	21	
50782592_MGH2	Calib	2009-01-01	M	45	male	50782592	right	1964	21	
50782592_UCI	Calib	2009-01-01	M	45	male	50782592	right	1964	21	
50782592_UCI2	Calib	2009-01-01	M	45	male	50782592	right	1964	21	
50782592_UCSD	Calib	2009-01-01	M	45	male	50782592	right	1964	21	
50782592_UCSD2	Calib	2009-01-01	M	45	male	50782592	right	1964	21	
58259524_BWH	Calib	2009-01-01	M	41	male	58259524	right	1968	21	
58259524_DUKE	Calib	2009-01-01	M	41	male	58259524	right	1968	21	
58259524_DUKE2	Calib	2009-01-01	M	41	male	58259524	right	1968	21	
58259524_MGH	Calib	2009-01-01	M	41	male	58259524	right	1968	21	
58259524_MGH2	Calib	2009-01-01	M	41	male	58259524	right	1968	21	
58259524_UCI	Calib	2009-01-01	M	41	male	58259524	right	1968	21	
58259524_UCI2	Calib	2009-01-01	M	41	male	58259524	right	1968	21	
58259524_UCSD	Calib	2009-01-01	M	41	male	58259524	right	1968	21	

Partial data set: Pivot type "MR Session" joined to "Subject" and filtered by project. Note that subjects with multiple scans are listed multiple times in the "Subject" column.

Now suppose you select **Subject** as your pivot data type. Your report format begins with a single row of data for every subject that you have permission to see. **This means:** If you join to MR Session, you will see **one and only one** result for MR session as relates to each Subject. In any longitudinal study, or any study that involves gathering multiple sessions of data, this would obviously be a confusing and non-ideal result.

Search 1 ✕

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Subject	Project	Gender	Hand	YOB	Education	Ses	MR Count	Notes
9956994	ADHD200						1	
50782592	Calib	male	right	1964	21		9	
58259524	Calib	male	right	1968	21		9	
73213384	Calib	male	right	1964	21		7	
79363080	Calib	female	right	1959	24		8	
99657608	Calib	male	right	1968	17		9	
OAS1_0002	CENTRAL_OASIS_CS	F	right			1	1	
OAS1_0003	CENTRAL_OASIS_CS	F	right			3	1	
OAS1_0004	CENTRAL_OASIS_CS	M	right				1	
OAS1_0005	CENTRAL_OASIS_CS	M	right				1	
OAS1_0007	CENTRAL_OASIS_CS	M	right				1	
OAS1_0009	CENTRAL_OASIS_CS	F	right				1	
OAS1_0010	CENTRAL_OASIS_CS	M	right			2	1	
OAS1_0011	CENTRAL_OASIS_CS	F	right			2	1	
OAS1_0012	CENTRAL_OASIS_CS	M	right				1	
OAS1_0013	CENTRAL_OASIS_CS	F	right			2	1	
OAS1_0014	CENTRAL_OASIS_CS	F	right				1	
OAS1_0015	CENTRAL_OASIS_CS	M	right				1	
OAS1_0016	CENTRAL_OASIS_CS	M	right			4	1	

Partial data set: Pivot type "Subject" joined to "MR Session" with the "Primary Project for Session" added and filtered by project. Note that subjects do not have linked MR Sessions; instead, a count of MR Sessions is provided.

Pivoting on visits

Users of XNAT 1.6 and above can use pivot on the new Visit data type. For example, select MR session as the pivot type. Your report format begins with a single row of data for every MR session you have permission to see. If you join to the Visit data type, you will see each MR session that is associated with a Visit. Then you can filter by visit_name and visit_type.

However, if you are running a longitudinal study, it may be more useful for you to install and use the [Visits and Protocols Plugin](#). This gives you a dedicated set of reporting tools that is similar to what is found in RedCap.