# Search Exploration

The Search Exploration page allows you to generate search terms based on central concepts of your nest. Enter your Population, Interventions (and Comparators), and Outcomes (PICO) to generate a Boolean query that can be used on PubMed, and explore potential search results' abstracts, key terminology, and topics of interest to help construct your final search strategy. When complete, proceed to Lit Search and Run your Search.

How to Begin Search Exploring

1. Navigate to Search Exploration
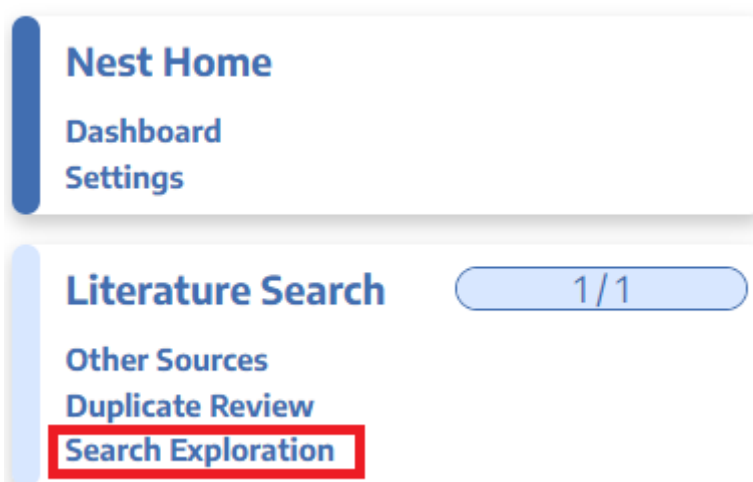

2. Enter PICO of Interest:

When you create a nest, you will have the option to add details about the Population, Interventions (and comparators), and Outcomes (PICO).

Imagine you are asking the Research Question: How do atypical antipsychotics (I) impact the quality of life and disability (O) in adults with schizophrenia (P)?

1. First, enter the Population (patients with schizophrenia), Interventions (atypical antipsychotics), and Outcomes (disability and quality of life) in the Concept bar under Create.
2. Enter each concept, then hit the Enter button, this will move them under Concepts.
3. Continue adding terms until you have enough terms to identify your specific topic area (**Recommended**: 2 to 5 terms per category).
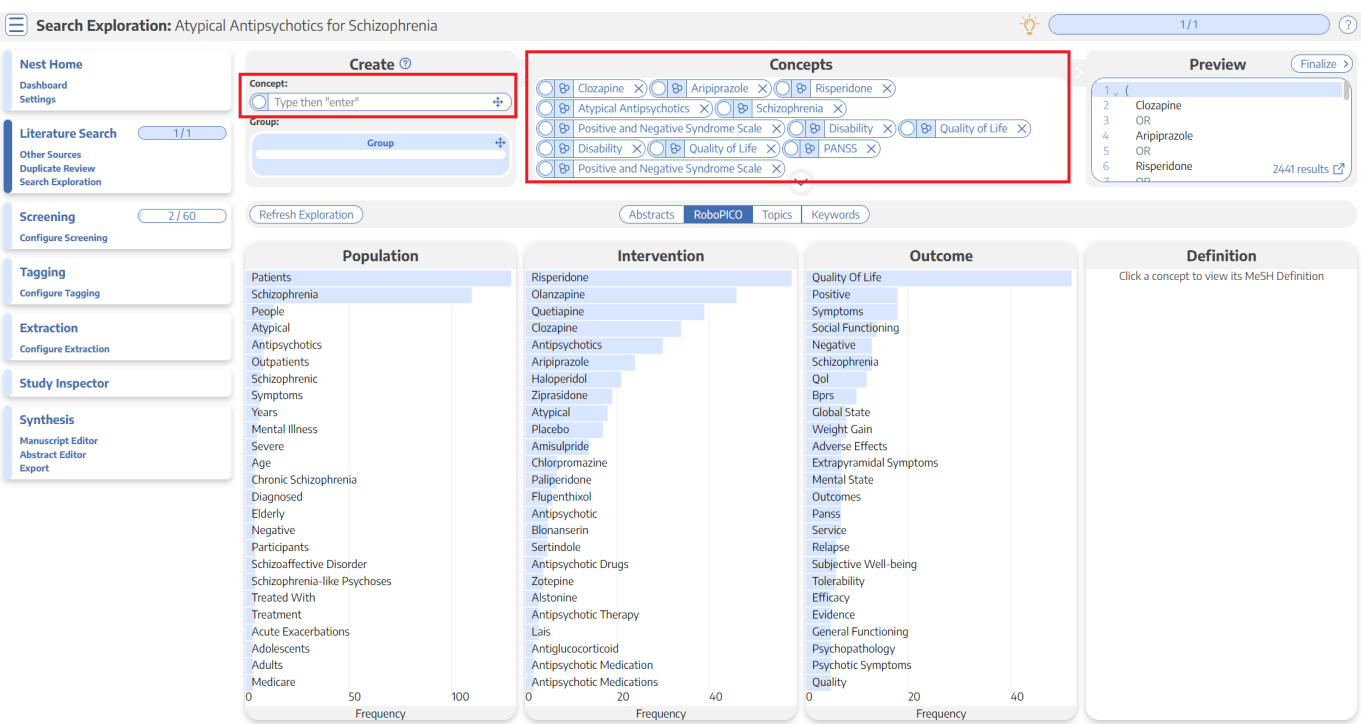
What is a **Comparator?** A comparator is the drug, device, or intervention that the main intervention is tested against. Typical comparator arms include placebo and standard of care (SOC). In the framework shown here, comparators can be included under interventions.
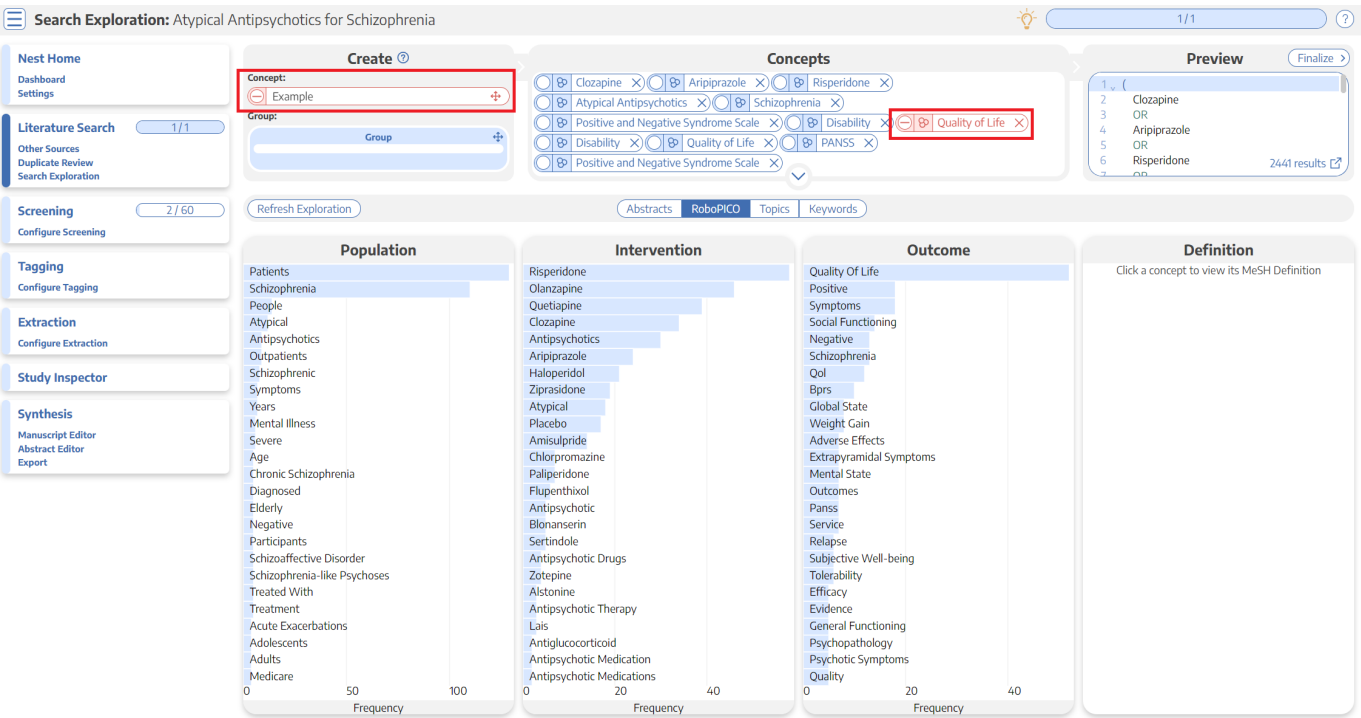
Negation: Check the negate box to exclude the specific PICO elements from your search. For example, you can add the population "Pediatric" and negate it if you would like to

> exclude pediatric populations from your research question.

3. Edit Concepts

When you have completed the tasks above, you will have unstructured concepts of interest, but no grouping of terms and no information yet populated to the Abstracts, RoboPICO, Topic Modeling, and Keywords.

To proceed, click on the down arrow under Concepts to view, add, and group together PICO elements. Alternatively, you can drag and drop a group into the concepts box to expand.

4. Group together PICO elements

1. Drag and drop the Group box into the concepts box.
2. Group together sets of populations, interventions, or outcomes. This group will function like the OR operator in search strings. In this example, specific types of antipsychotic medications are grouped together.
3. You can also negate whole groups by checking the box next to Negate.

5. Run or Update Search Exploration

To populate Abstracts, RoboPICO, Topic Modeling, and Keywords:

- Select the "Refresh Exploration" button

- A modal will appear while Search Exploration refreshes. This may take a minute, since this will run a pre-search of PubMed.

When you update search exploration, the references in your nest **will not change.** The records and data returned from this step will only be used for Search Exploration.

How to Interpret Search Exploration Findings

There are several ways to explore the references pulled by your exploratory search. The goal of this process should be to **expand or refine your search terms** so that they return as many records of interest while limiting irrelevant results.

Iterative Refinement: As you use the tools outlined below to add, remove, or restructure your terms, you should periodically re-run "Update Search Exploration", as this is **only run manually**, and not automatically updated.

1. Abstracts

Skim through abstracts retrieved through your search exploration terms.
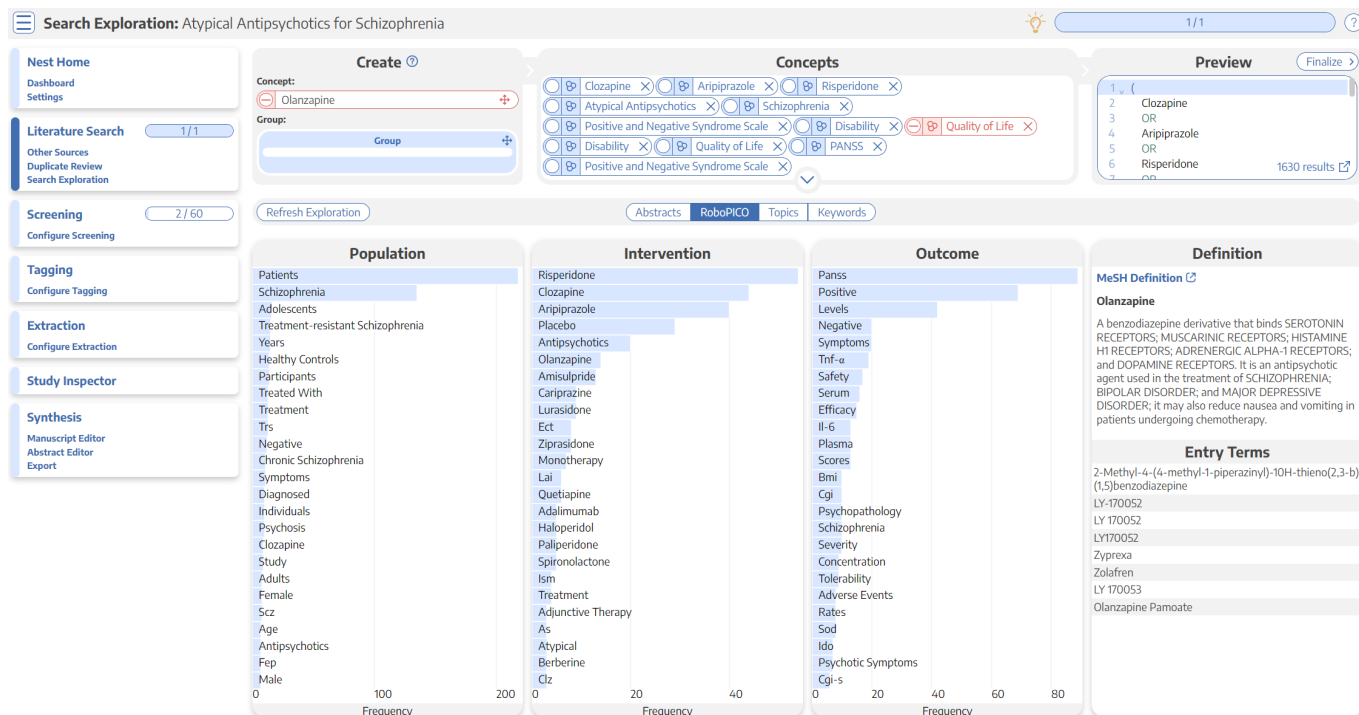
The purpose of reviewing Abstracts should be to:

1. Confirm that your search is returning relevant records, and
2. Identify the key terms found in relevant records and adding them to your PICO terms.

2. RoboPICO

Browse commonly-mentioned Populations, Interventions, and Outcomes from abstracts and titles. PICO elements are identified by RoboPICO, which is an open source fork of the models offered in RobotReviewer.

The purpose of RoboPICO should be to:

1. Identify the most common topics of underlying abstracts, and
2. Identify terms that you should add to your PICO (which you can populate to "Add a PICO Element" by clicking on the relevant row).

Clicking a row in the chart also initiates a strict MeSH lookup on the PICO element; not all extracted PICOs will correspond to MeSHs, but expect approximately half of lookups to succeed. In the event of a failed lookup, MeSH and Google search linkouts are offered.

> What are MeSH? Medical Subject Headings (MeSH) are terms defined by the National Library of Medicine as a way to organize and search the content of medical literature. In some ways, MeSH are similar to Nested Knowledge tags, but unlike tags, MeSH are standardized.

3. Topics

Explore topics that appear most frequently among the references. References may belong to one or more topics, or none. Clicking a topic shows references belonging to the topic.

These topics are derived from a Carrot2 clustering of abstract text to identify semantically similar concepts and group them.

4. Keywords and N-Grams

Explore the frequency of word combinations (n-grams) from abstracts or indexed descriptors (MeSH and/or journal keywords). While n-grams are presented in order of occurence in abstract text, descriptors are inherently unordered. Clicking a row shows unique references containing the combination.

Next Steps

When is Search Exploration finished?

You should continue iteratively refining your query until your Abstract, RoboPICO, Topics, and/or Keywords contain mostly relevant content and minimal extraneous records or concepts.

It is useful to **check the total number of records** returned from your query. To do so, view the number of records in the top right of the Preview screen, where you can also click to view the query on PubMed:

To view the full query, expand using the dropdown arrow. You can view the results returned in PubMed by clicking on #### results. You can finalize the query (input it into your nest) by selecting Finalize and following the steps.

There is no 'right' number of records, but a good rule of thumb is to return:

1. A maximum of **200-300 records**, with
2. An anticipated inclusion rate **at or above 20%.**

The reasoning behind this recommendation is that you want to capture relevant records while

minimizing extra work during Screening (remember, your team will need to manually Screen all results from your Search!). You can always add new/expanded Searches as you proceed, so achieving a high rate of inclusion should be prioritized over comprehensiveness.

After hitting Finalize, you will be taken to the Add Search modal, but pre-populated with the query you have built. Here you can edit the query, the search engine, and notes before hitting Add. This adds the search just like a regular one!

What comes after Search Exploration?

When you are finished with Search Exploration, proceed to review, test, and finalize your search string in Lit Search!