# SlicerDicer for Pathologists

## I. Introduction


SlicerDicer is a self-service reporting tool that provides users with intuitive and customizable data exploration abilities. Using SlicerDicer, users can find the data they need to investigate, and then refine their searches on the fly to better understand the data they work with. Right in Hyperspace, they can examine trends, drill down to line-level details, and jump to related records to follow up.

Note: SlicerDicer is a great tool but is not the best choice for all reporting needs. SlicerDicer draws from data that is at least a day old, so you can't use it for real-time reporting, such as acute care monitoring. In addition, most of the time SlicerDicer can search only discrete data. For example, SlicerDicer doesn't know a patient has a particular diagnosis if the only place the diagnosis is documented is in a free text note. As always, handle patient data with care.

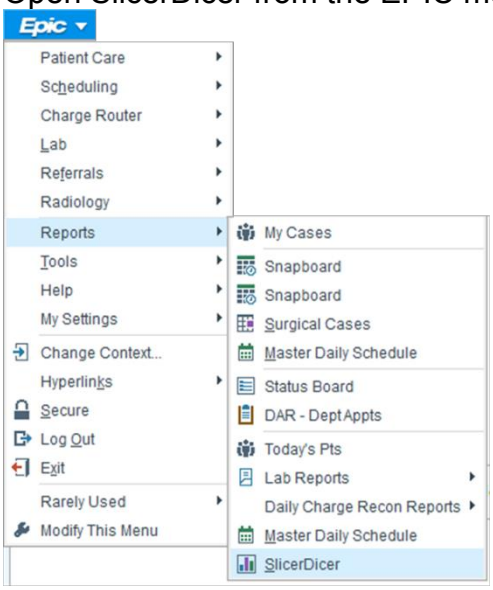
This tutorial will guide you through the basics of case searching in SlicerDicer with a few specific examples of more advanced searches.

# II. Table of Contents

# III. Basic Case Search

## 1. Open SlicerDicer

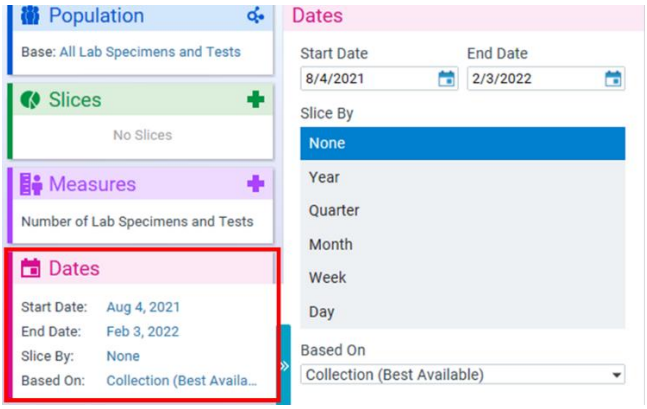
Open SlicerDicer from the EPIC menu



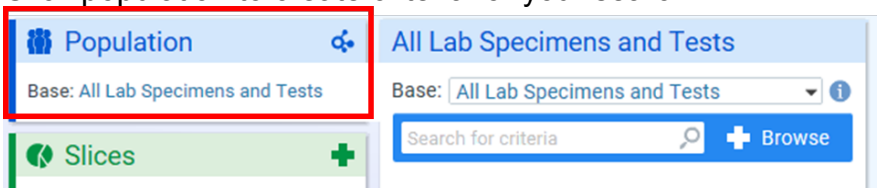

Select “Lab Specimens and Tests” model and click through the tutorials if it’s your first time


## 2. Set Search Criteria

Click on “Dates” to select a date range for your search



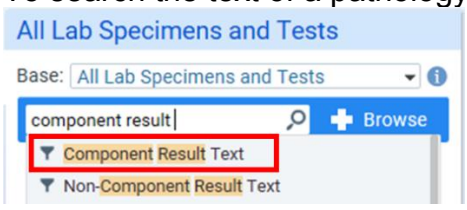

Click population to create criteria for your search



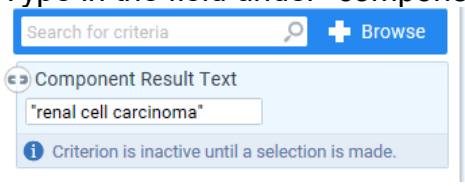

There are many components you can search for in the “Search for criteria” field

**i. Text Search**

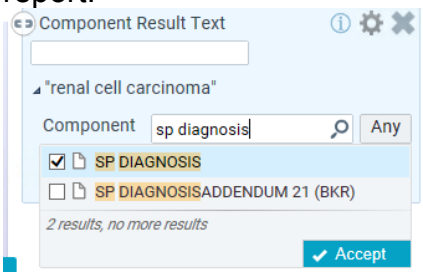
To search the text of a pathology report, start typing “component result text” and select



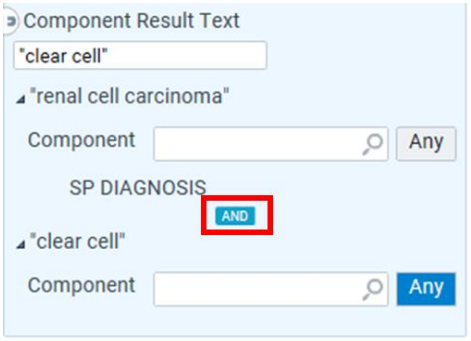

Type in the field under “component result text” for text search. Use “” for exact phrases




You may specify which field of the report you want to search. The most commonly used is “SP diagnosis”, which searches the diagnosis field, interpretation field (cytology) and all addenda of a report. You may also search other fields such as “gross examination”, “microscopic examination”, etc. If you do not specify, it will search everywhere in the report.



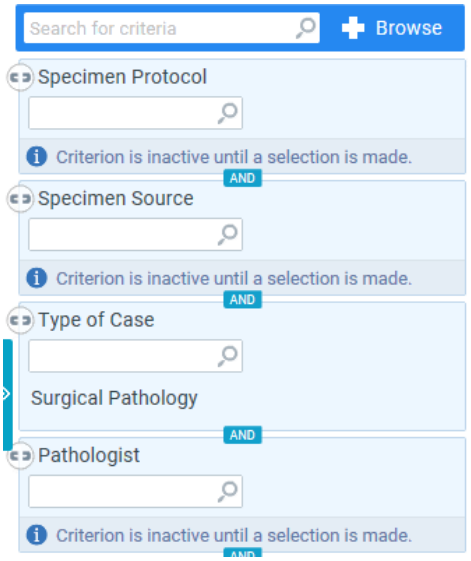

You may add another text search by typing in the field under “component result text” again. You can click on the “OR” or “AND” to change the logic operator.




### ii. Other Component Search

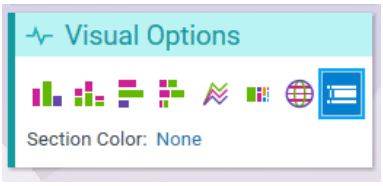
You may add other search criteria by typing in the “search for criteria” field or clicking on the “Browse” button to browse available criteria. Commonly used components are “Type of Case”, “Specimen Source”, “Specimen Protocol”, “Pathologist”, etc. See specific examples section for sample demonstrations.

Note: A complete list of components can be found in the excel file “List of Components”.
Cases before Beaker is used (in 2014) are legacy cases, and you can only do text search (“component result text”) on them.



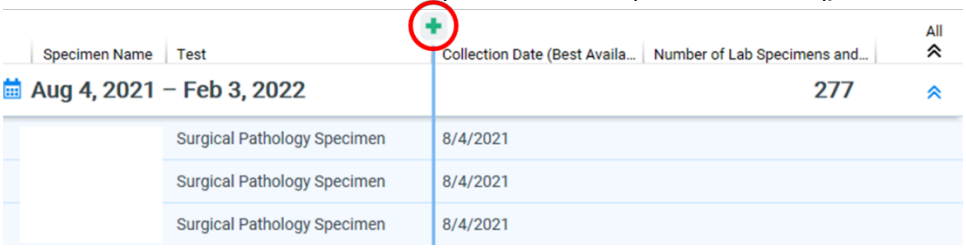

## 3. Generate and Export Case List

To see the detailed list of cases, click on under “Visual Options”

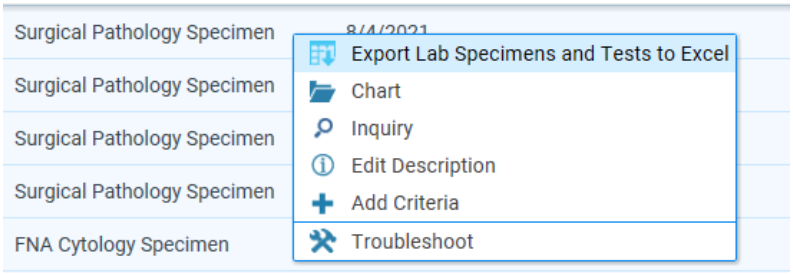



Click on the blue downward arrow and “load all” to expand the list

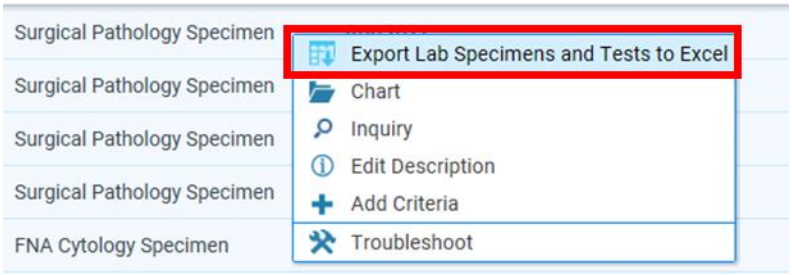
You may add columns by clicking on the “+” button in between columns. Commonly used columns include: “case name” (case number), “lab MRN” (patient’s MRN), “pathologist”, etc.




You may open a case by right clicking on it and selecting “Chart” to open patient’s chart or “Inquiry” to open case inquiry.

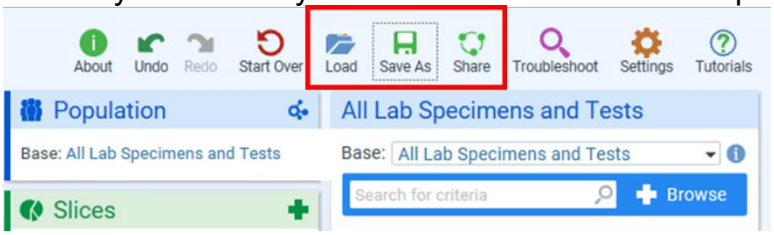



You may export the list of cases to an Excel file by right clicking any case and selecting “Export Lab Specimens and Tests to Excel”. You will need to add a password to the export file. The best place to save the file seems to be your “U:” drive.



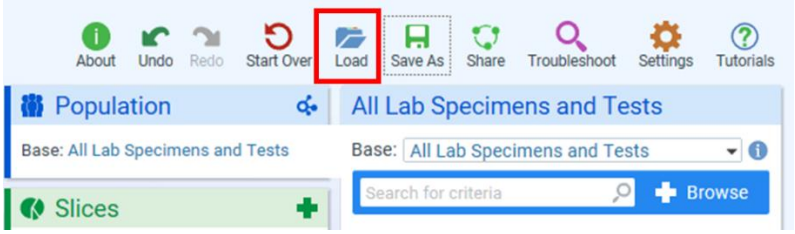

## 4. Save/Load/Share Search Sessions

You may save your search session by clicking on “Save As” button and reload it on another day by clicking the “Load” button. It will save all your criteria and all the columns you added. You may also share your search session with other people by clicking the “Share” button.

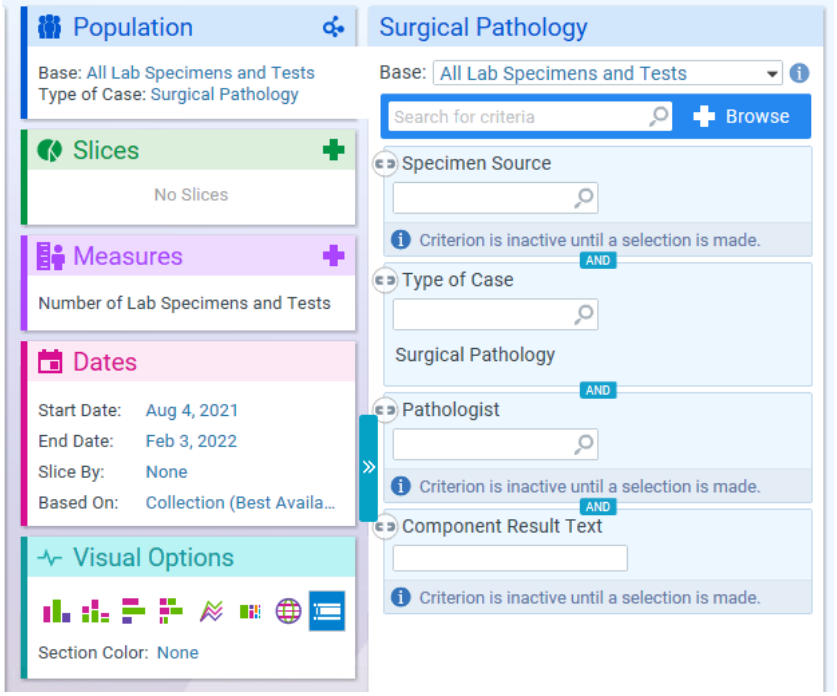



## 5. Shared Search Templates (optional)

There are a few published search templates that may be helpful for you. To access them, click “Load” button



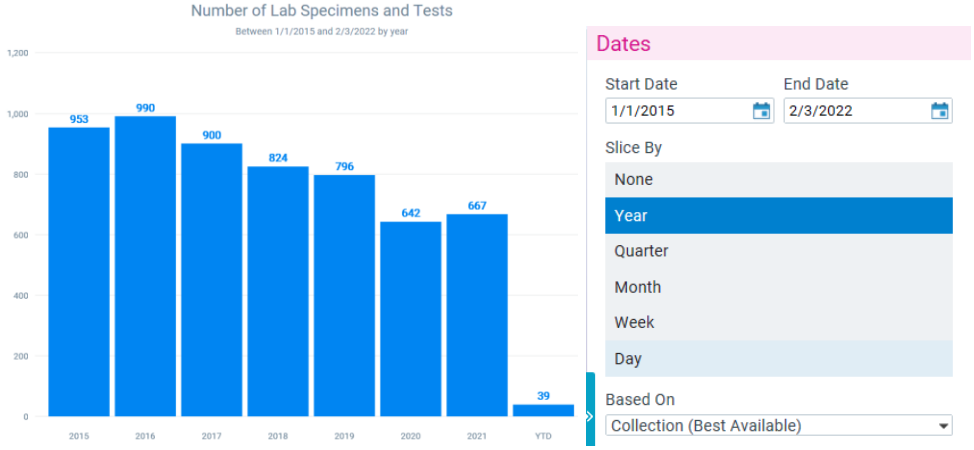
You will see the search sessions that are published, shared with you, or saved by yourself. It is a good idea to make your own template for frequently used criteria, visual options, dates, and report columns. The criteria components can be left blank. Here is an example:



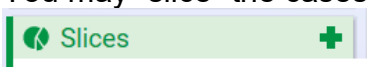

## 6. Visualize Data (optional)

After you generate a list of cases that satisfy your search criteria, you may “slice” your data in a variety of ways.

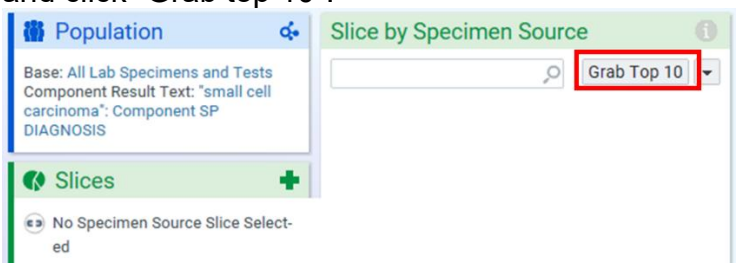
You may graph the cases by years/quarters/months/weeks/days under “Dates” tab:

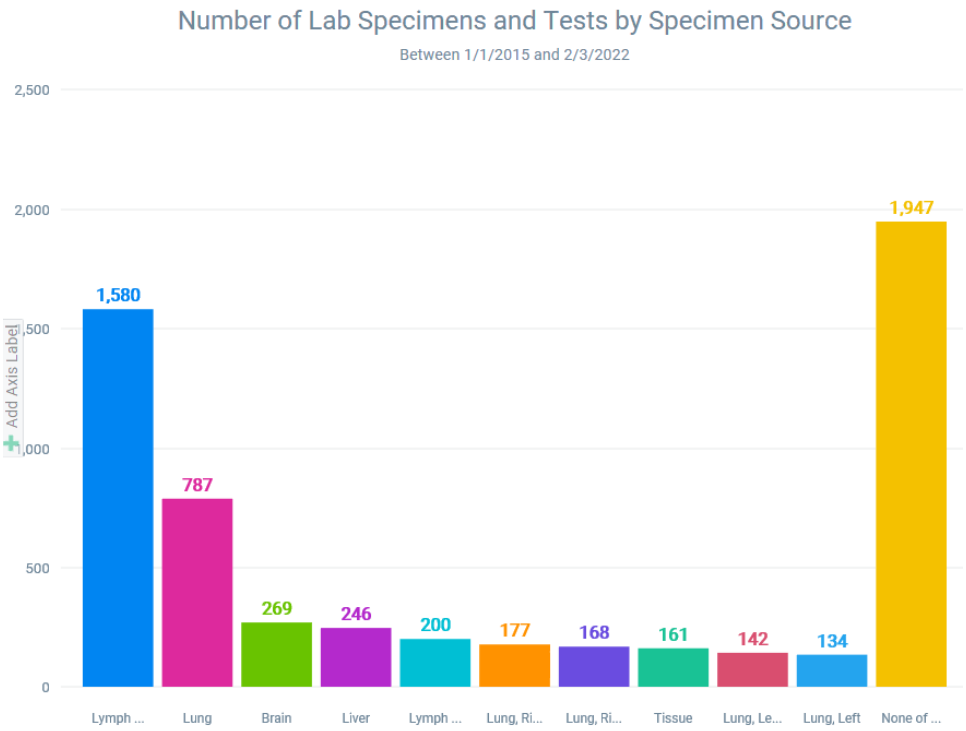



You may “slice” the cases by different ways by clicking the “+” button on the “Slices” tab.

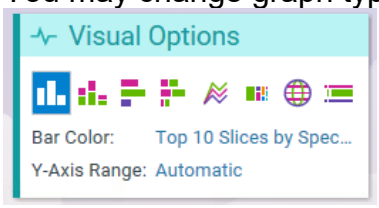



Here’s an example that “slices” the cases by specimen source by selecting “specimen source” and click “Grab top 10”.





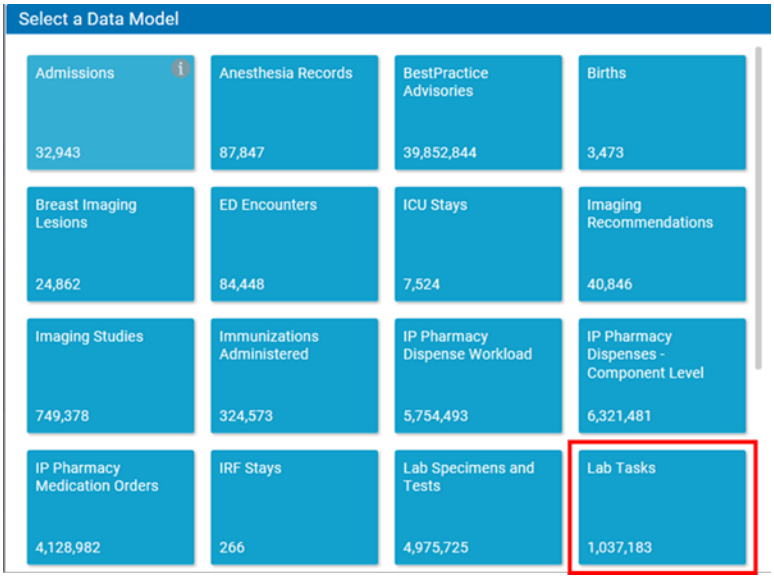

You may change graph types by clicking different graph icons under “Visual Options” tab.



# IV. Other SlicerDicer Models

The “Lab Specimens and Tests” model is the SlicerDicer model that is most applicable to pathologists. However, other models may also help with research especially when clinical correlations are useful.

## 1. Lab Tasks Model

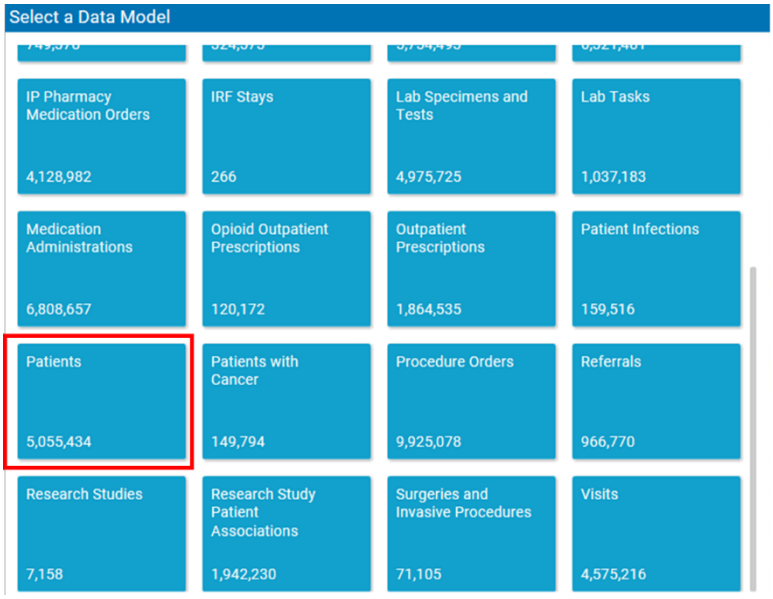



The “Lab Tasks” model is very similar to the “Lab Specimens and Tests” model. However, their returned search results are different. In “Lab Specimens and Tests”, each line of results is a case/block. In “Lab Tasks”, each line is a completed lab task such as block creation, slide creation, media plate creation, aliquot creation, etc. It is useful for investigation on the completion of each task including details about the workload and quality of particular lab sections and specific users (lab technologists, residents, PAs, etc.)

An example is shown here on the frozen section task:

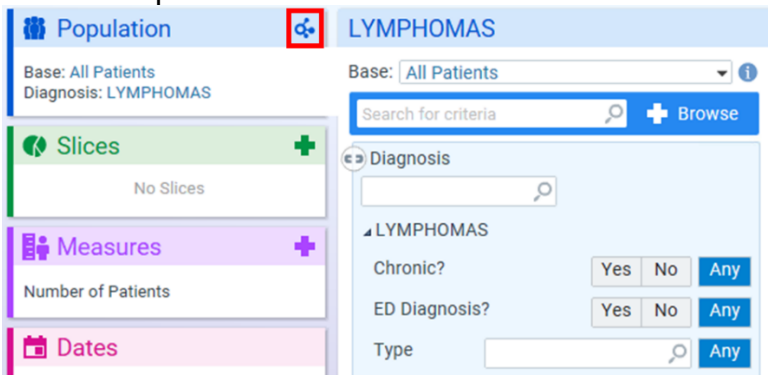
| Task Container Name | Task | Task Completion Date | Task Completion User | Task Completion Lab |
|---|---|---|---|---|
| Aug 4, 2021 – Feb 3, 2022 | | | | |
| | FS H&E slide | 8/4/2021 09:13 | | DUH SURGICAL PATHOLOGY A |
| | FS H&E slide | 8/4/2021 09:26 | | DUH SURGICAL PATHOLOGY A |
| | FS H&E slide | 8/4/2021 17:50 | | DUH SURGICAL PATHOLOGY A |
| | FS H&E slide | 8/4/2021 08:08 | | DUH SURGICAL PATHOLOGY A |
| | FS H&E slide | 8/4/2021 08:08 | | DUH SURGICAL PATHOLOGY A |
| | FS H&E slide | 8/4/2021 08:08 | | DUH SURGICAL PATHOLOGY A |

## 2. Patients Model and Linking to Pathology Cases

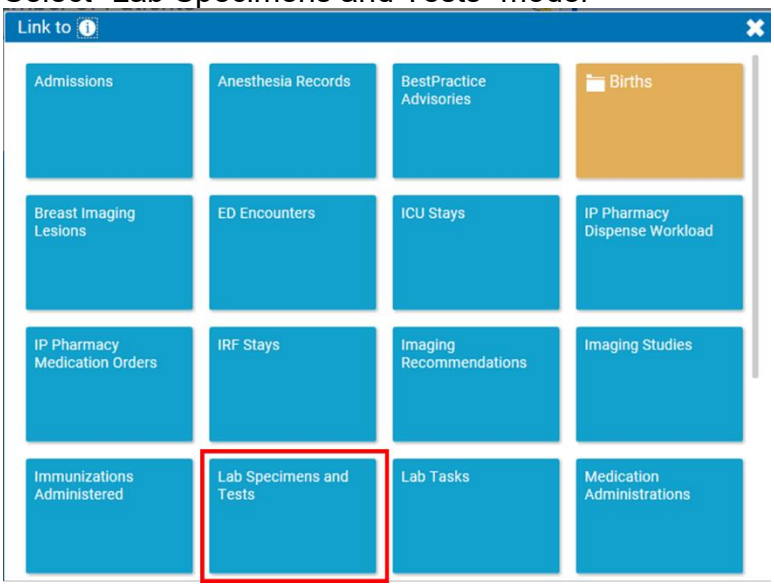



The “Patients” model mainly contains patients’ information including diagnoses, chief complaints, family history, immunizations, medications, etc. Each search result is an individual patient. This model can become very useful when you link patients to pathology cases.

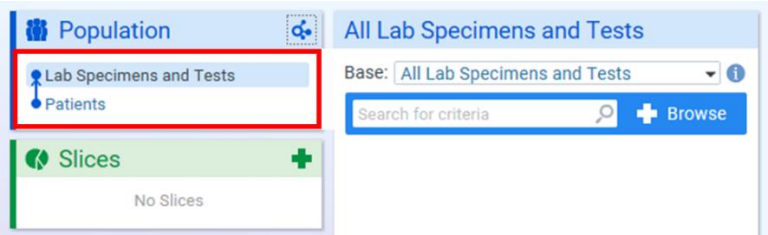
To do this, after searching patients with certain criteria, click the “link” button on the right side of “Population” tab.




Select “Lab Specimens and Tests” model



Then you can perform your regular case searches only in those patients you specified in the “Patients” model.



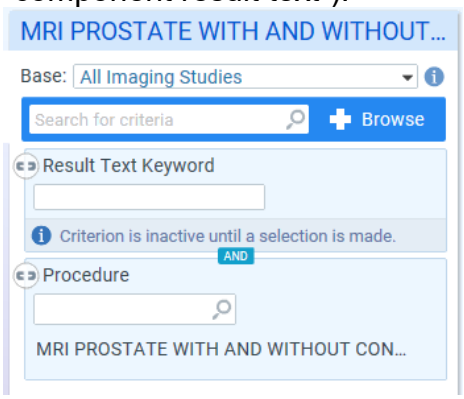

A sample application of this function is included in the “Specific Examples” section.

Note: If you open up “Lab Specimens and Tests” model first and then link to the “Patients” model, the results you get will be a list of patients rather than a list of pathology cases/lab tests.

## 3. Imaging Model

Another model that may be useful for pathologists is the “Imaging Studies” model when you would like to correlate the pathology cases with imaging findings.


The two most useful criteria components are “procedure” and “result text keyword” (NOT “component result text”).




Unfortunately, this “Imaging Studies” model can only be linked the “Patients” model but not the “Lab Specimens and Tests” model. If you would like to correlate the pathology cases with

imaging findings, you may have to export both the imaging case list and pathology case list to Excel and match the patient's MRN and test dates.

# V. Specific Examples

In this section, a few sample searches for specific situations are provided.

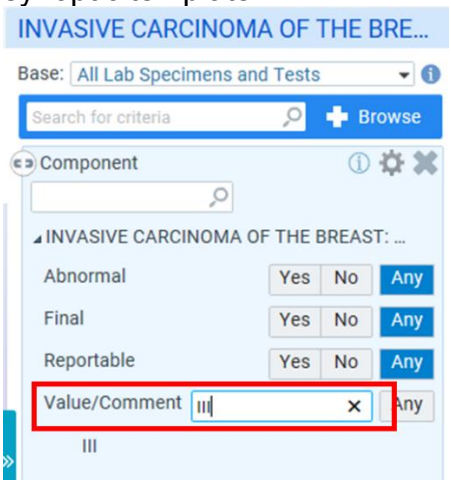
## 1. Synoptic Report Search

To search the results within synoptic results, you need to know the name of the synoptic component you are interested in. You may find that in a synoptic report of any of your patients.

Here is an example of breast cancer resection synoptic search for cases with grade 3 DCIS present in the resection specimen.

After setting the date range, start typing “invasive carcinoma DCIS grade” in the “Search for criteria” field and select the right component.


Type “III” in the Value/Comment field. Note it’s “III” not “3” because that’s the option in the synoptic template.

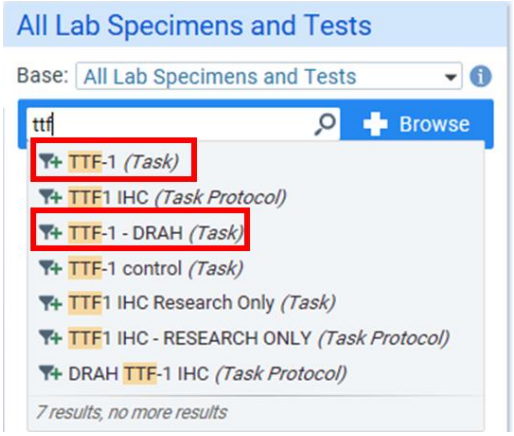



This will generate a list of cases with synoptic reports that have grade 3 DCIS.

## 2. IHC Search

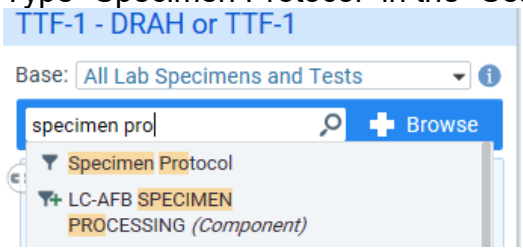
The easiest way to search for cases where certain IHC stains were ordered is to search the IHC task.
Here is an example to search for lung transbronchial biopsy cases where TTF-1 IHC stain was ordered.

Type “TTF” in the “Search for criteria” field and select the components. Note that “TTF-1 – DRAH” is the TTF-1 IHC task used at Duke Raleigh. We may include it if needed.

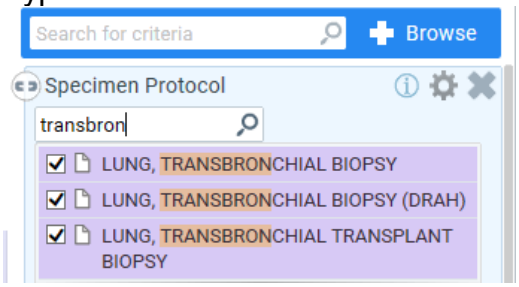



The best way to find transbronchial biopsy cases is to use “Specimen Protocol”. “Specimen Source” may not be helpful because it will include large resection cases as well.

Type “Specimen Protocol” in the “Search for criteria” field and select “Specimen Protocol”.




Type “transbronchial” in the field under “Specimen Protocol” and select the ones we want.



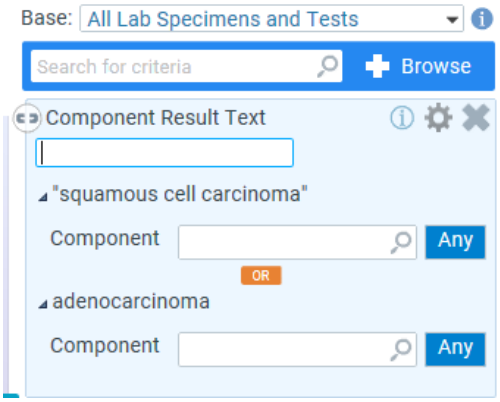

Now we have generated a list of transbronchial biopsy cases where TTF-1 was ordered.

Unfortunately, because there are no discrete components that report IHC staining results (unlike synoptic reports) and that stain results are reported in different ways in the report, we generally cannot directly search for cases that are positive for an IHC stain. We have to open each report to find out the reported staining result.

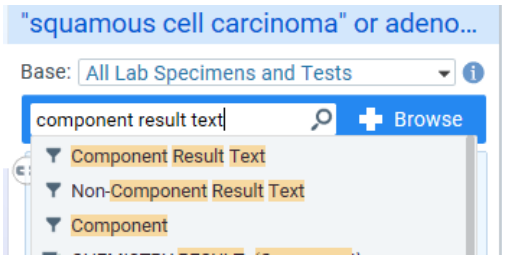
## 3. Using Logic Operators in Search Criteria

SlicerDicer supports basic logic operators in search criteria. For example, we want to look for adenocarcinomas and squamous cell carcinomas of the lung where TTF-1 but not CK7 stains were performed.

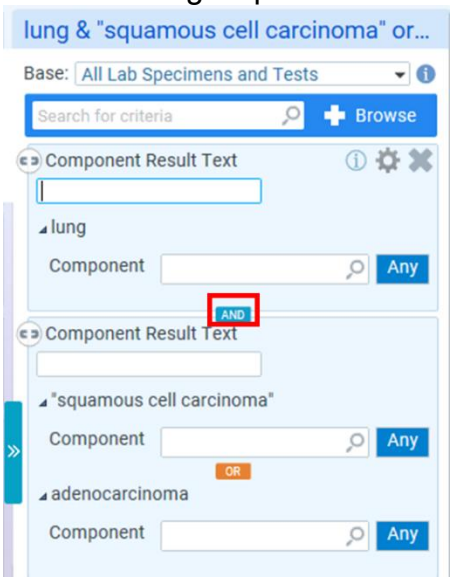
We can type “squamous cell carcinoma” in the “Component Result Text” field and press enter. Type again “adenocarcinoma” in the “Component Result Text” field and press enter. By default, SlicerDicer will add “OR” between the two.



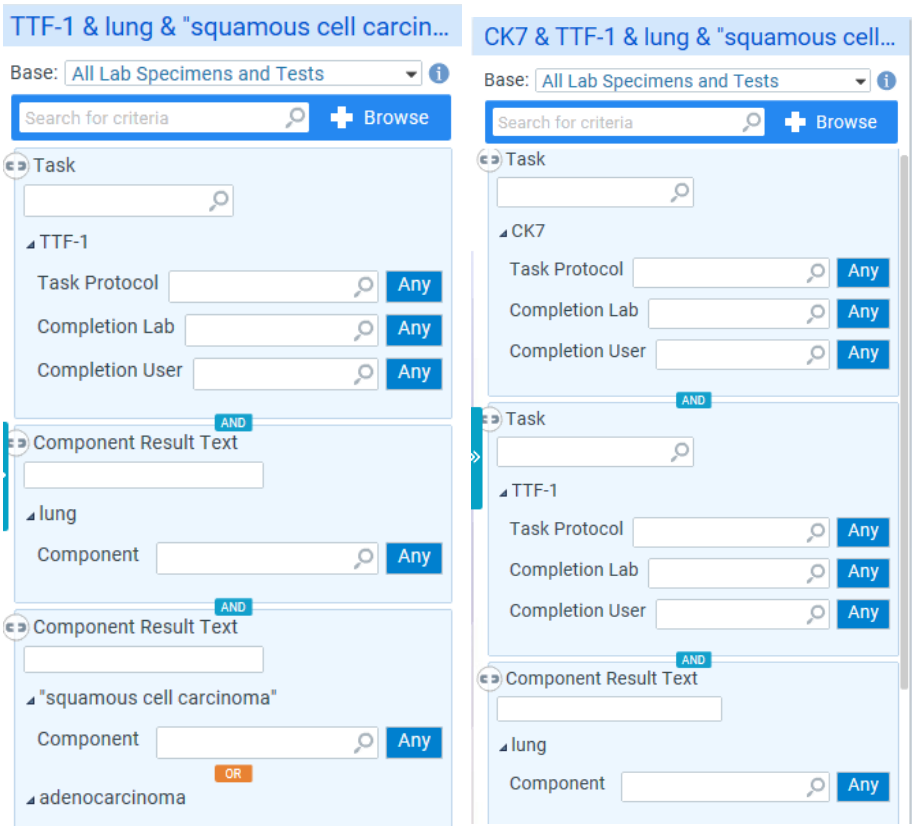

Suppose we want to include metastatic cases and not just search the primary lung cases. We can add another “Component Result Text” criterion by selecting “component result text” again in the “Search for criteria” field.



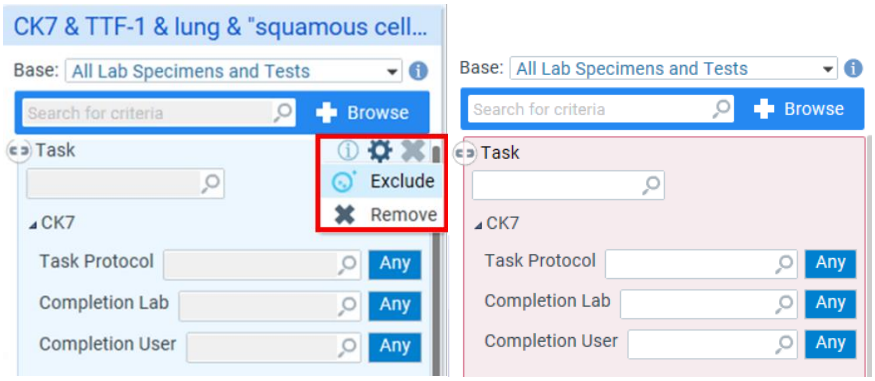

Then we can enter “lung” in the new “Component Result Text” field. By default, SlicerDicer will use “AND” logic operator between the two “Component Result Text” criteria.



Next, we can add TTF-1 stain by typing “TTF” in the “Search for criteria” field and select “TTF-1 (task)”. To exclude cases with CK7 stain, we need to first add “CK7 (task)” criterion by typing “CK7” in the “Search for criteria” field.

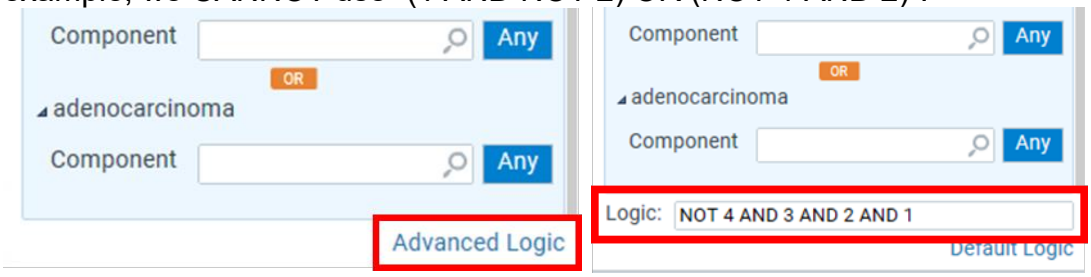



To exclude cases with CK7 stain, we need to click the gear icon  and select “Exclude”. The excluded criteria will turn red.




Now, we finally have the list of cases we wanted.

We can also click on the “Advanced Logic” button to manually edit the logic operators. We can use “AND”, “OR”, or parentheses. However, each criterion may only be used once. For example, we CANNOT use “(1 AND NOT 2) OR (NOT 1 AND 2)”.

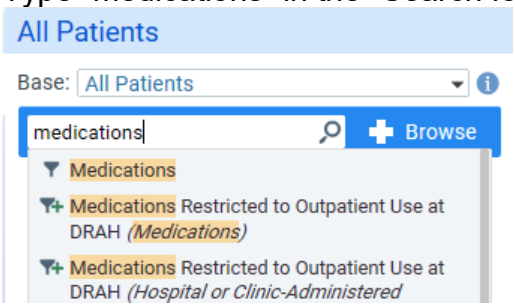


## 4. Linking Lab Tests/Pathology Cases with Patients' Data

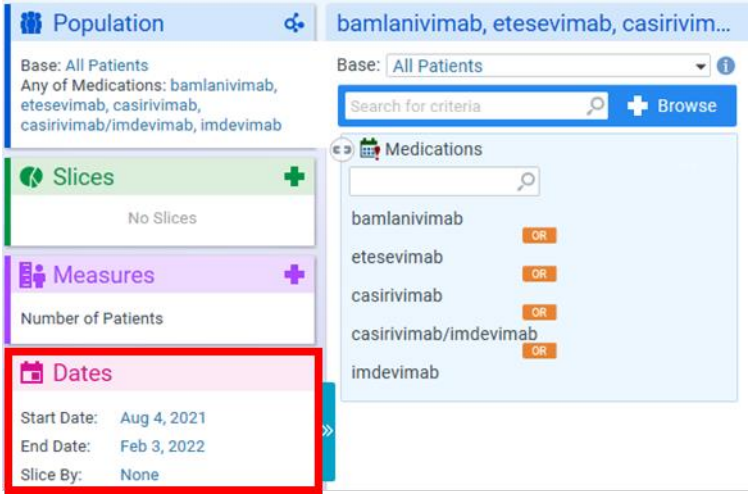
Suppose we would like to study the effect of anti-SARS-CoV-2 monoclonal antibody treatment on serum immunofixation test results. We need to find immunofixation cases where the patients are taking or have taken bamlanivimab, etesevimab, casirivimab, and imdevimab.

We first open up the "Patients" model in SlicerDicer.

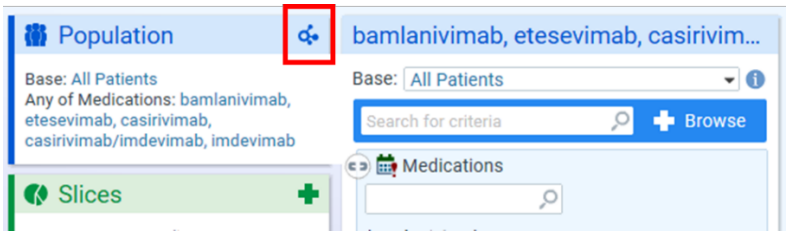

Type "medications" in the "Search for criteria" field and select "Medications"




Under "Medications" component, search for the names of medications. Note that now we may specify a date range when the medications were administered.



Click the “link” button on the right side of “Population” tab and select “Lab Specimens and Tests” model.

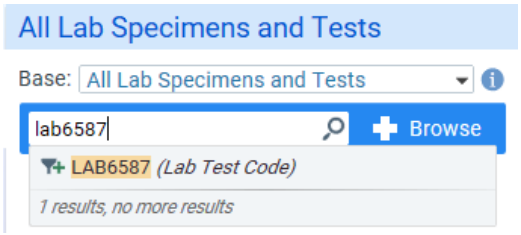




If we type “immunofixation” in the “Search for criteria” field, it may be difficult to know which test is the correct one. We may try each or all of them; however, another way to do this is to find a patient who had the test done and find the “lab number” in the chart as shown below:

Immunofixation Electrophoresis (IFE), Serum [LAB6587]

In this case, the number we want is “LAB6587”. Type “LAB6587” in the “Search for criteria” field and select the test.




Remember that we may specify the date range when the test was performed.
Now we have generated a list of serum IFE tests whose patients have received anti-SARS-CoV-2 monoclonal antibody treatment.
If we start out with the “Lab Specimens and Tests” model first and link it to the “Patients” model, we will have a list of patients who have taken anti-SARS-CoV-2 monoclonal antibody and have undergone serum IFE testing.

# VI. List of Commonly Used Components

The names of all the different components can sometimes be confusing. A few commonly used components are listed here for your convenience.

| Name | Explanation | Examples |
|---|---|---|
| Component result text | Free text search | In this field:   you can further specify what field to search for. Examples:<br>• SP diagnosis (includes Diagnosis, Addendums, Interpretation, Findings)<br>• Clinical History, Clinical Information<br>• Gross Examination<br>• Microscopic Examination<br>• Procedure Notes<br>• Immediate Assessment |
| Test | Case type | • Surgical pathology specimen (inside cases);<br>• Surgical pathology – slide consult (outside cases);<br>• FNA cytology specimen (FNA cases)<br>• General cytology specimen (Non-GYN cytology cases)<br>• GYN cytology specimen (GYN cytology cases) |
| Task | Task ordered/ performed | • CK7, CK20, panCK (IHCs)<br>• Recut H&E<br>• Unstained slide |
| Task protocol | Protocol used to accession case | • GI Biopsy protocol<br>• LUNG-TOTAL/LOBE/SEGMENT RESECTION<br>• BREAST BIOPSY NCB |
| Specimen source | Specimen source | |
| Pathologist | Responsible pathologist | |

# VII. Limitations of SlicerDicer

SlicerDicer is a very powerful search tool for pathologists. However, it has also its limitations.

1. Data are at least three days old. Therefore, it's not for real-time reporting.

2. It is difficult to distinguish positive and negative results in free text searches (e.g. positive for rejection, positive EBER, or excluding a diagnosis e.g. not IBD).

3. For cases before 6/2021 (legacy data), cannot search or only a limited number of components work.

4. The "Lab Specimens and Tests" model does searches in each block. Therefore, we will have repeated results for the same case if it has multiple blocks.

5. We cannot search for cases that have scanned whole slide images (as far as I know).

6. There may be multiple entries for the same code/search, may make search more difficult.

# VIII. Contact Information

Please feel free to contact the following people if you have any questions or suggestions regarding SlicerDicer or other search tools.

| Name | Position | Email |
|---|---|---|
| Brian Vadasz | Heme Path/Clinical Informatics Fellow | brian.vadasz@nm.org |
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