National Cancer Imaging Archive 2.4

User's Guide

NATIONAL® CANCER INSTITUTE

Center for Bioinformatics

August 9, 2007

Credits and Resources

National Cancer Imaging Archive (NCIA) Development and Management Teams		
Development	***Documentation***	***Product and Program Management***
Durga Addepalli[1]	Carl Blake[1]	Anand Basu[2]
David Bauer[1]	Jon Dietrich [1]	Carl Blake[1]
Carl Blake[1]	John Freymann[3]	Laurence Clarke
John Freymann[1]	Jill Hadfield [2]	Peter Covitz[2]
Sharon Gaheen[1]	Laura Jackel [2]	John Freymann[3]
Thai Le[1]	Thai Le[1]	Sharon Gaheen[1]
Scott McCrimmon [1]	James Luo[1]	Carl Jaffe[3]
Qinyan Pan[1]	Qinyan Pan[1]	Sichen Liu[2]
John Perry[1]	John Perry[6]	Eliot Siegel[3,4,5,6]
Rona Zhou[1]	Andrew Shinohara[1]	Daniel Sullivan[3]
	Rona Zhou[1]	
[1] Science Application International Corporation (SAIC)	[2] National Cancer Institute Center for Bioinformatics (NCICB)	[3] National Cancer Institute, Cancer Imaging Program (CIP)
[4] University of Maryland, Department of Diagnostic Radiology	[5] VA Maryland Healthcare System	[6] MIRC Committee, Radiological Society of North America (RSNA)

Contacts and Support	
NCICB Application Support	http://ncicb.nci.nih.gov/NCICB/support Telephone: 301-451-4384 Toll free: 888-478-4423

LISTSERV facilities pertinent to NCIA		
LISTSERV	***URL***	***Name***
NCIA Steering	**https://list.nih.gov/archives/ncia_steering.html**	NCIA Steering Discussion Forum
NCIA Developers	**https://list.nih.gov/archives/ncia_developers.html**	NCIA Developers Discussion Forum

CONTENTS

About This Guide 1

Purpose 1
Audience 1
Topics Covered 1
Additional References 2
Text Conventions Used 2

Chapter 1
Getting Started in NCIA 2.4 3

Introduction to NCIA 3
Creating a New User Account 4
Logging into NCIA 5
Using the NCIA Home Page 6
Home Page Menu Bar 6
Home Page Left Sidebar 7
Other Home Page Panels 8
Using NCIA News Page 9
News Page Menu Bar 10
News Page Site Map 10
News Page Left Sidebar 10
Using NCIA Online Help 11
Accessing NCIA from Another Application 12
Application Support 13

Chapter 2
Searching for Images 15

Specifying Remote Search Sites 15
Performing Searches 16
Performing a Simple Search 17
Searching Curation Data 20
Annotation Keyword Search Page 20
Performing an Advanced Search 22

Working with Saved Search Queries 27
Saving a Search Query 27
Managing Saved Queries 28
Editing Saved Queries 29
Viewing a Query History 30
Viewing Search Results 31
Search Results (by Subject) 32
Search Results (Studies for Subject) 33
Search Results (Images for Series) 35
Working with the Data Basket 36
Adding Items to Your Basket 36
Managing the Data Basket 37
Downloading the Data Basket 38
Obtaining DICOM Viewers 39
Initiating Searches from Other Applications 39

Chapter 3
NCIA Administration 41

Administration Functions Overview 41
Using the Quality Control (QC) Tool 41
Updating Curation Status 44
Uploading and Parsing the Curation Spreadsheet 45
Verifying Submitted Files 46

Appendix A
URL References 49

FTP Client Software Products 49
DICOM 49
Cedara 49
NCIA 50

Appendix B
NCIA Glossary 51

Index 53

This is a U.S. Government work.

About This Guide

This section introduces you to the *NCIA 2.4 User's Guide*. It includes the following topics:

- *Purpose* on this page
- *Audience* on this page
- *Topics Covered* on page 1
- *Additional References* on page 2
- *Text Conventions Used* on page 2

Purpose

This guide provides an overview of National Cancer Imaging Archive (NCIA). It explains how to use NCIA to access local, and if available, remote imaging archives.

Audience

The *NCIA 2.2 User's Guide* is the documentation for the NCIA web-based application. The intended audience for this guide are researchers including pathologists and radiologists at cancer centers, academia, and industry that access NCIA through commonly available web browser software.

Topics Covered

The *NCIA User's Guide* discusses the following topics:

- *Chapter 1* provides an introduction to NCIA and describes how to access NCIA.
- *Chapter 2* describes how to search the local and any selected remote image databases.
- *Chapter 3* discusses administrative functions in NCIA.
- *Appendix A* provides a list of URL references referred to within the text.
- *Appendix B* includes a list of abbreviations and their meanings.
- *Index* references key words and terms.

Additional References

To visualize images with the Cedera I-Response Workstation software, refer to Cedera documentation.

Text Conventions Used

This section explains conventions used in this guide. The various typefaces represent interface components, keyboard shortcuts, toolbar buttons, dialog box options, and text that you type.

Convention	*Description*	*Example*
Bold	Highlights names of option buttons, check boxes, drop-down menus, menu commands, command buttons, or icons.	Click **Search**.
URL	Indicates a Web address.	http://domain.com
text in SMALL CAPS	Indicates a keyboard shortcut.	Press ENTER.
text in SMALL CAPS + text in SMALL CAPS	Indicates keys that are pressed simultaneously.	Press SHIFT + CTRL.
Italics	Highlights references to other documents, sections, figures, and tables.	See *Figure 4.5*.
Italic boldface monospace type	Represents text that you type.	In the **New Subset** text box, enter ***Proprietary Proteins.***
Note:	Highlights information of particular importance	**Note:** This concept is used throughout the document.
{ }	Surrounds replaceable items.	Replace {last name, first name} with the Principal Investigator's name.

CHAPTER

1

GETTING STARTED IN NCIA 2.4

This chapter describes how to use NCIA.

Topics in this chapter include:

- *Introduction to NCIA* on this page
- *Creating a New User Account* on page 4
- *Logging into NCIA* on page 5
- *Using the NCIA Home Page* on page 6
- *Using NCIA News Page* on page 9
- *Using NCIA Online Help* on page 11
- *Application Support* on page 13

Introduction to NCIA

NCIA provides the cancer research and medical community, industry, and academia access to the local NCIA imaging archive, and if available, remote imaging databases that can be used for many purposes, including the potential to assist in the development and validation of analytical software tools supporting these functions:

- Lesion detection and classification software
- Accelerated diagnostic imaging decision
- Quantitative imaging assessment of drug response

Note: If the Remote Search option appears on the NCIA home page, you can search remote imaging archives located outside of the local NCIA archive.

The archives provide access to imaging resources that improve the use of imaging in today's cancer research and practice by increasing the efficiency and reproducibility of imaging cancer detection and diagnosis, leveraging imaging to provide an objective

assessment of therapeutic response, and ultimately enabling the development of imaging resources that will lead to improved clinical decision support.

Clinical trials, physicians and other researchers submit images to NCIA using the MIRC (Medical Imaging Resource Center) software. Any potential user may then access NCIA to search for and download images and associated annotation files.

Images are stored in the medical image standard, Digital Imaging and Communications in Medicine (DICOM). A DICOM file stores the digital image along with a series of tags that contain metadata about the image such as patient ID, study ID, patient weight, anatomic site, and so forth. For more information about DICOM, see http://medical.nema.org/.

NCIA is accessible at https://imaging.nci.nih.gov. In the Welcome/Login page that opens, you can perform the following tasks:

- Learn the basics about NCIA by reading the welcome page introduction
- Open a window that provides links for downloading DICOM viewers
- Open Quick Links to websites relevant to the goals and tasks of NCIA. See *Home Page Left Sidebar* on page 7.
- Register for a new user account.
- Log into NCIA.

Creating a New User Account

To register a new user in NCIA, from the NCIA welcome and login page, follow these steps:

1. Click the **Register** hypertext link under the **Login** button.
2. In the registration form that opens (*Figure 1.1*), enter the required information. Items with an asterisk are required fields.

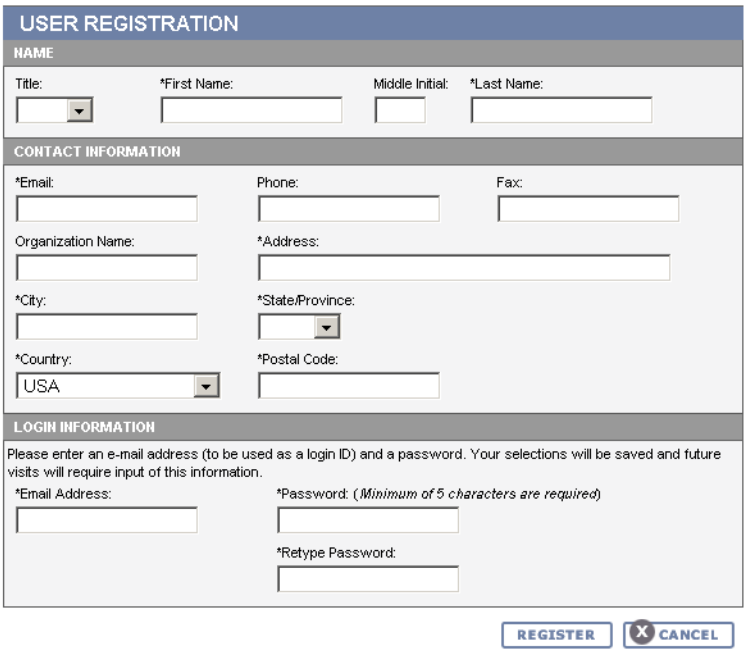


Figure 1.1 New user registration form

3. Click **Register** to execute the submission of the user information. Click **Cancel** to return to the login screen.

Once you have submitted your entry form, you are forwarded to the home page and you are granted immediate access.

Logging into NCIA

When you click the https://imaging.nci.nih.gov to access NCIA and indicate your agreement on the Legal Rules of the Road, the welcome/login page displays.

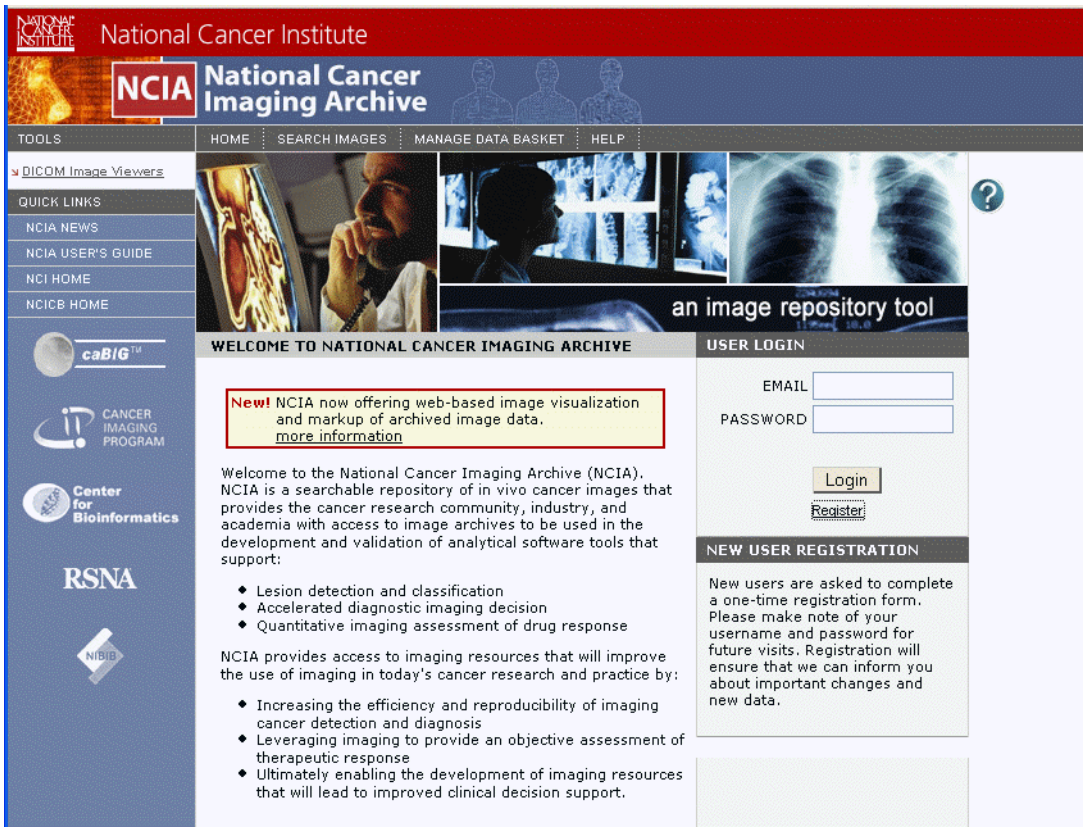


Figure 1.2 NCIA Welcome/Login page

If you have already registered with NCIA, perform the following steps to login from the User Login panel (*Figure 1.2*).

1. Enter the login information, your **EMAIL** and **PASSWORD**.
2. Click **Login**.

   Note: If your EMAIL or PASSWORD is not correct, the following error message displays: **Invalid username/password. Please try again.**

   If you do not have a login ID or password, click **Register** to apply for a user account. For more information, see *Creating a New User Account* on page 4.

3. The NCIA home page is updated to include the NCIA application.

Note: If you launch a search of the NCIA database from another application, when you do so, you are brought to the NCIA login page. Use the same login instructions in steps 1 through 3 above.

Using the NCIA Home Page

The NCIA welcome/home page that opens after login displays several panels and menu bars (*Figure 1.3*).

Figure 1.3 NCIA home page after login

Home Page Menu Bar

The top menu bar on the welcome/home page consists of the options described in *Table 1.1*.

Option	*Description*	*See for More Information*
Home	Returns you to the NCIA Home page	N/A
Search Images	Displays the Simple Search page	*Performing a Simple Search* on page 17
Remote Search	Displays the Search Remote Sites page This function is available only when NCIA is configured for remote image sites.	*Specifying Remote Search Sites* on page 15

Table 1.1 NCIA home page menu bar options

Option	Description	See for More Information
Manage Data Basket	Displays the My Data Basket page; This is the same option as choosing **My Data Basket > View Contents** from the side menu bar.	*Managing the Data Basket* on page 37
Help	Displays a separate online Help window	*Using NCIA Online Help* on page 11
Logout	Logs you out of NCIA and returns you to the NCIA home page	N/A

Table 1.1 NCIA home page menu bar options

Home Page Left Sidebar

The left sidebar of the Welcome page down through **My Queries** consists of the options described in *Table 1.2*.

Option	Description	See for More Information
Tools > DICOM Image Viewers	Displays the DICOM Viewer Links window	*Obtaining DICOM Viewers* on page 39
My Data Basket > View Contents	Displays the My Data Basket page	*Managing the Data Basket* on page 37
My Queries >View Saved Queries	Displays the Saved Queries page	*Managing Saved Queries* on page 28
My Queries >View Query History	Displays the Query History page	*Viewing a Query History* on page 30
Tools > QC Tool	Allows a curator to evaluate a submission and assign a QC status	*Using the Quality Control (QC) Tool* on page 41
Tools > Upload Curation Data	Provides the means to upload and parse an annotation spreadsheet	*Uploading and Parsing the Curation Spreadsheet* on page 45
Tools > Verify Submission	Verifies an image submission and its status through a report	*Verifying Submitted Files* on page 46

Table 1.2 NCIA home page left sidebar options

Quick Links

The **Quick Links** menu options on the lower left sidebar displayed in most NCIA viewers provide sources for NCIA- and NCI-related bioinformatics information on the Internet. The options are described in *Table 1.3*.

Option	Description	See for More Information
Quick Links > **NCIA News**	Displays the NCIA News page in a separate window.	*Using NCIA News Page* on page 9

Table 1.3 Left sidebar Quick Links

Option	Description	See for More Information
Quick Links > **NCIA User's Guide**	Opens a pdf version of the NCIA User's Guide.	N/A
Quick Links > **NCI Home**	Displays the NCI home page in a separate window.	N/A
Quick Links > **NCICB Home**	Displays the NCICB home page in a separate window.	N/A

Table 1.3 Left sidebar Quick Links

Other Home Page Panels

The various panels of the welcome/home page display an additional variety of options described in *Table 1.4*.

Option	Description	See for More Information
Center Panel		
Search Images	Displays the Simple Search screen	*Performing a Simple Search* on page 17
Simple Search	Displays the Simple Search screen	*Performing a Simple Search* on page 17
Advanced Search	Displays the Advanced Search screen	*Performing an Advanced Search* on page 22
Remote Search	Displays the Search Remote Sites screen	*Specifying Remote Search Sites* on page 15
Manage Data Basket	Displays the My Data Basket page	*Managing the Data Basket* on page 37
Right-hand panel		
NCIA Updates	Displays the last date and time visible images were made available. This date reflects the last update of any images and does not consider whether you have access to them.	N/A
NCICB Application Support	Displays phone numbers to contact NCICB Application Support. See	*Application Support* on page 13.
Bottom menu bar		
Contact Us	Displays an email addressed to ncicb@pop.nci.nih.gov so you can email questions to NCICB application support	N/A
Privacy Notice	Displays the Health and Human Services (HHS) Privacy Policy Notice.	N/A
Disclaimer	Displays the NCIA Legal Rules of the Road disclaimer.	N/A

Table 1.4 NCIA home page welcome panel options

Option	Description	See for More Information
Accessibility	Displays the NCI Web Accessibility Feedback Form to be used by users with disabilities who have comments about the accessibility of NCI's web pages.	N/A
Support	Displays the Welcome to the NCICB Application Support Site web site.	N/A

Table 1.4 NCIA home page welcome panel options

Using NCIA News Page

To open the NCIA News page, click on the corresponding link under *Quick Links* on the lower left sidebar of any NCIA page.

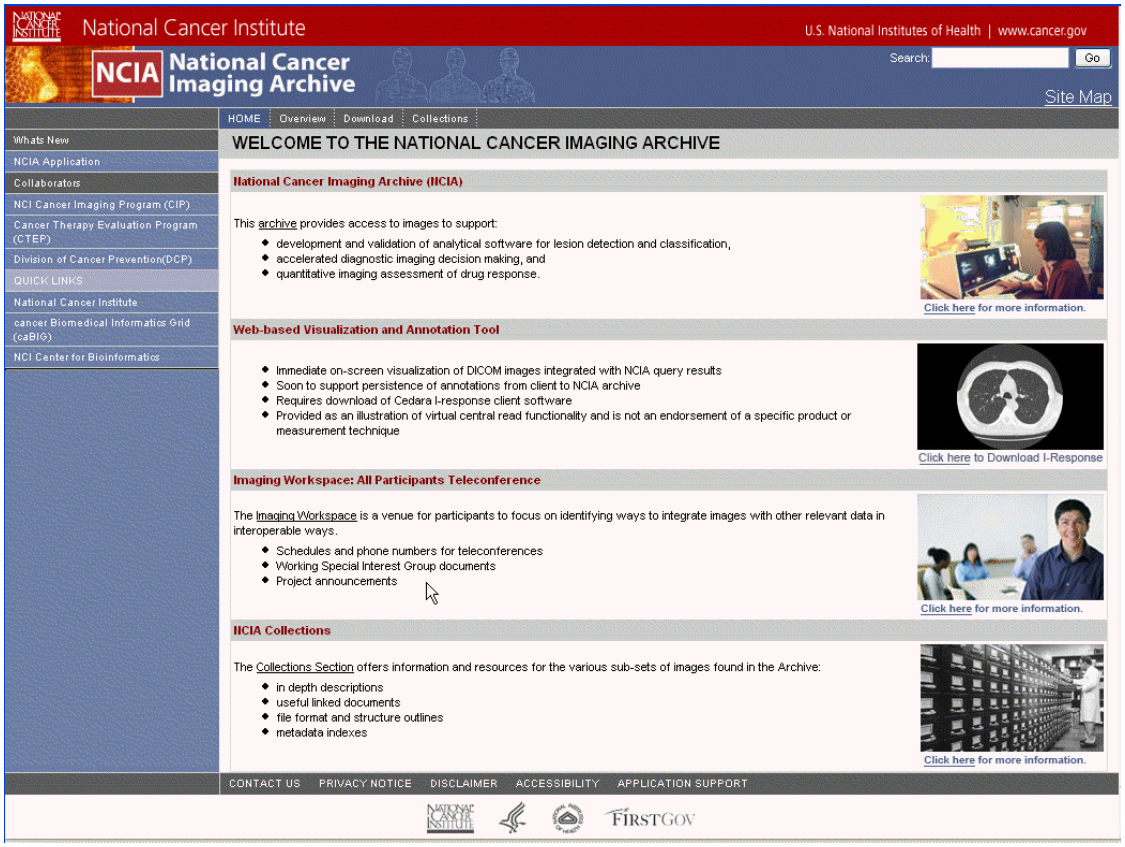


Figure 1.4 NCIA news page

The NCIA News page (*Figure 1.4*) consists of a center panel that displays current NCIA-related information as well as sidebar and menu bar options that navigate to websites and NCIA pages relevant to your tasks.

News Page Menu Bar

The News page top menu bar (*Figure 1.4*) consists of the options described in *Table 1.5*.

Option	Description
Home	Returns you to the NCIA News home page
Overview	Provides an overview of NCIA and its goals
Download	Displays NCIA software available for download (Descriptions are included in *News Page Left Sidebar*).
Collections	Describes existing and future collections.

Table 1.5 News page top menu bar descriptions

News Page Site Map

Click the **Site Map** link in the upper right hand corner of the News page to display a list of site map information provided in the center panel (see *Figure 1.5*).

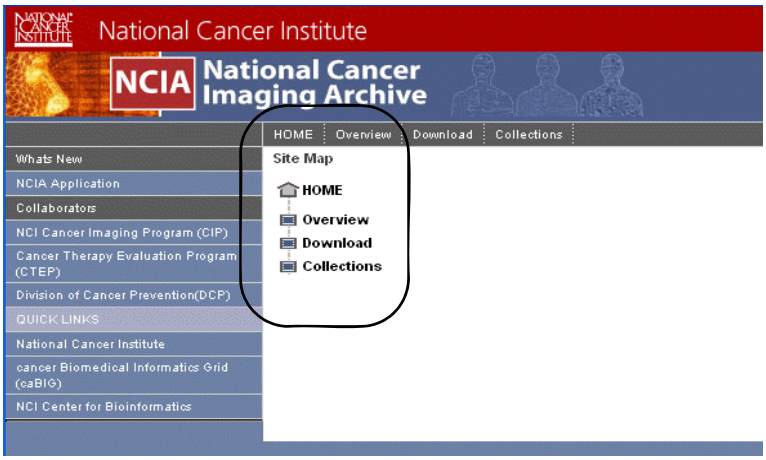


Figure 1.5 News page Site Map

These Site Map links are similar to the menu bar options on the page, described in *Other Home Page Panels* on page 8.

If you click the **Download** menu option or the link in the Site Map, each takes you to a Download page that has a link to the NCICB Download Center, where you can download NCIA 1.4 and its related files. For more information, refer to https://imaging.nci.nih.gov.

News Page Left Sidebar

The left sidebar of the News page down through **Collaborators** consists of the options described in *Table 1.6*. For more information about the Quick Links options, see *Quick Links* on page 7.

Option	Description
NCIA Application	Contains a link to the NCIA application

Table 1.6 News page left sidebar descriptions

Option	Description
Collaborators > NCI Cancer Imaging Program (CIP)	Displays the CIP website in a separate browser window
Collaborators > Cancer Therapy Evaluation Program (CTEP)	Displays the CTEP website in a separate browser window
Collaborators > Division of Cancer Prevention (DCP)	Displays the DCP website in a separate browser window

Table 1.6 News page left sidebar descriptions (Continued)

Using NCIA Online Help

The online help has been written to help you master the NCIA software.

To access online help in NCIA, use any of the following methods:

- Click the **Help** menu option on the top menu bar to open the complete online help project or a Guided Tour.

  Note: You can access online help without being logged into NCIA.

- Click the **Help** icon or button at the top of each page to open a context sensitive topic.
- Click a **Guided Tour** link then click one of the **here** links to start an online tutorial on how to register for NCIA or the basic steps to use NCIA.

Once you are in online help, an array of options helps you locate topics of interest.

- Context-sensitive help displays online help topics that correspond to the “form” or page from which help was opened. Click the TOC button ( ) at the top left of the title bar to open the full online help directory.
- Follow hypertext links or the **Related Topics** buttons in the help topics to open other closely related topics.

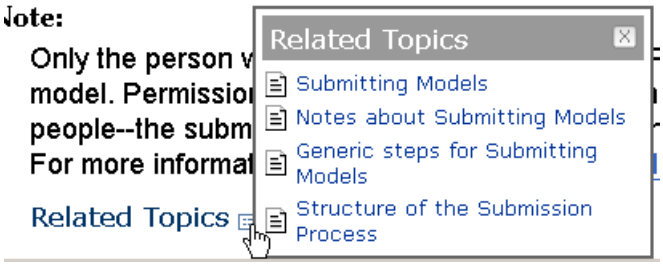


Figure 1.6 Related Topics button and associated list

- Locate topics using the table of contents that displays in the left pane of the online help project or the Index tab that displays at the top of the Table of Contents pane.
- Perform word searches of Help by entering query text in the search text box.

Note: A monitor resolution of greater than 800x600 is highly recommended for these guided tours. If you have problems viewing the online tutorials, you may need to install the

Flash Plug-in for your browser. Go to the Macromedia website to download this free plug-in (http://www.macromedia.com/shockwave/download/download.cgi?P1_Prod_Version=ShockwaveFlash).

Accessing NCIA from Another Application

Searches in NCIA can be launched from other applications configured with this feature. For specific information about launching NCIA from another application, refer to the online help or user documentation from that application.

When NCIA is launched by a search defined and initiated from another application, the system runs the query, then opens to the NCIA login page where you must login to see the search results. This search feature is designed to search the image repository to find images specified by the link in the other application, then to display images as identified there. Once you are logged into NCIA, if the search is successful, NCIA displays a viewer showing one or more search result image(s) you defined in the other application.

Example:

This feature is found in the caIntegrator application, I-SPY. The application I-SPY can launch a search for images identified as "before" and "after" (such as before and after treatment). If the search is successful, the before and after shots specified in the search criteria would display in NCIA. For I-SPY, see the download page on the NCICB website: http://ncicb.nci.nih.gov/download/.

From this Search Results page that opens in NCIA, you can perform the following actions:

- Click **Add to Basket** to add the image to the Data Basket.
- Click **View Series** to display the Images for Series page. This page displays all of the image thumbnails for the series containing the image(s) displayed above the link.
- Click **Open Full Size JPEG** to display the image in full size mode (in a separate browser window).

Application Support

For any general information about the application, application support or to report a bug, contact NCICB Application Support.

Email: ncicb@pop.nci.nih.gov	When submitting support requests via email, please include: ● Your contact information, including your telephone number. ● The name of the application/tool you are using ● The URL if it is a Web-based application ● A description of the problem and steps to recreate it. ● The text of any error messages you have received
Application Support URL	http://ncicb.nci.nih.gov/NCICB/support
Telephone: 301-451-4384 or toll free: 888-478-4423	Telephone support is available Monday to Friday, 8 am – 8 pm Eastern Time, excluding government holidays.

CHAPTER 2
SEARCHING FOR IMAGES

This chapter describes how to use NCIA.

Topics in this chapter include:

- *Specifying Remote Search Sites* on page 15
- *Performing Searches* on page 16
- *Working with Saved Search Queries* on page 27
- *Viewing Search Results* on page 31
- *Working with the Data Basket* on page 36
- *Obtaining DICOM Viewers* on page 39
- *Initiating Searches from Other Applications* on page 39

Specifying Remote Search Sites

A remote search site is an image database residing outside of the local NCIA imaging archive. When you select a remote image database, Simple, Advanced, and Annotation Keyword Search pages display search results for the local NCIA imaging archive AND any selected remote sites.

Note: If there are no remote sites configured during installation, the Remote Search function does not display on the NCIA home page.

To select remote search sites, follow these steps:

1. Initiate the search by following one of these options:
    - Click **Remote Search** from the top menu bar.
    - Click the **Remote Search** link in the Welcome panel or on the menu bar

Any of these options open the Search Remote Sites page (*Figure 2.1*).

Figure 2.1 Search Remotes Sites

"Local" represents the NCIA imaging archive that you are currently logged into. "Local" is always selected and cannot be unchecked. Any disabled remote sites are not available.

2. Select the remote site(s) that you want to search, and click the **Submit** button.

The Simple Search page appears. For more information about simple searches, see *Performing a Simple Search*.

Performing Searches

NCIA enables you to search for images in the local NCIA *in vivo* image repository, and if available, use the Remote Search function to search in remote imaging archives. NCIA is designed to perform the following tasks:

- Search for images in simple or advanced search mode
- Combine search criteria defined in those searches with keyword searches of curated annotation data
- Save the search queries to be used repeatedly
- Review query histories
- As subjects, studies, series or images are located, save them to your data basket for download

Note: When you download a series that have annotation files (indicated by **Yes** in the **Contains Annotations** column), they are automatically downloaded as well.

The NCIA submissions are organized in the following hierarchy, which is important to remember in creating your search query and reviewing search results:

Clinical trial > Patient (Subject) > Study > Series > Images

NCIA provides three search modes:

- Simple Search
- Advanced Search
- Annotation Keyword Search

Some search pages contain toggle buttons to allow you to switch back and forth between the Simple Search and Advanced Search pages.

Each search page contains selection boxes, drop-down lists and text fields. Selected objects are used as search criteria.

1. **Selection Boxes.**
   - To move an item from the **Available** box to the Selected panel, highlight it in the Available box and click **Select**.
   - Click **Select All** to select all available items and move them to the Selected panel in one keystroke.
   - To remove an item from the Selected panel, highlight the item(s) and click **Remove** or click **Remove All** to remove all items.
2. **Drop-down Lists.** Click on a drop-down list arrow and select the appropriate choice.

Text fields. Enter the information requested.

Performing a Simple Search

A simple search consists of basic criteria; they can be expanded for an advanced search. All simple searches are made at the series level from the Simple Search page

Perform the following steps to complete a Simple Search.

1. Initiate the search by following one of these options:
   - Click **Search Images** from the top menu bar.
   - Click the **Search Images** link in the Welcome panel or on the menu bar
   - Click the **Simple Search** link in the Welcome panel.
   - From the Advanced Search page, click the **Simple Search** button in the upper right hand corner. The Simple Search page displays with the basic criteria that may have already been selected.

   Any of these options open the Simple Search page. The Remote Sites Selected table at the top of the page lists the remote databases you may have selected to be searched outside the local NCIA imaging archive (*Figure 2.2*). (See *Specifying Remote Search Sites* on page 15.)

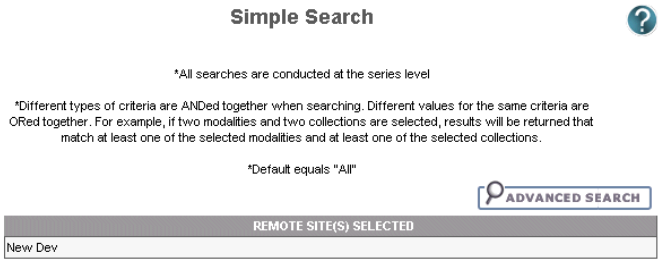


Figure 2.2 Simple Search page (top)

The remainder of the Simple Search page displays the search criteria (*Figure 2.3*).

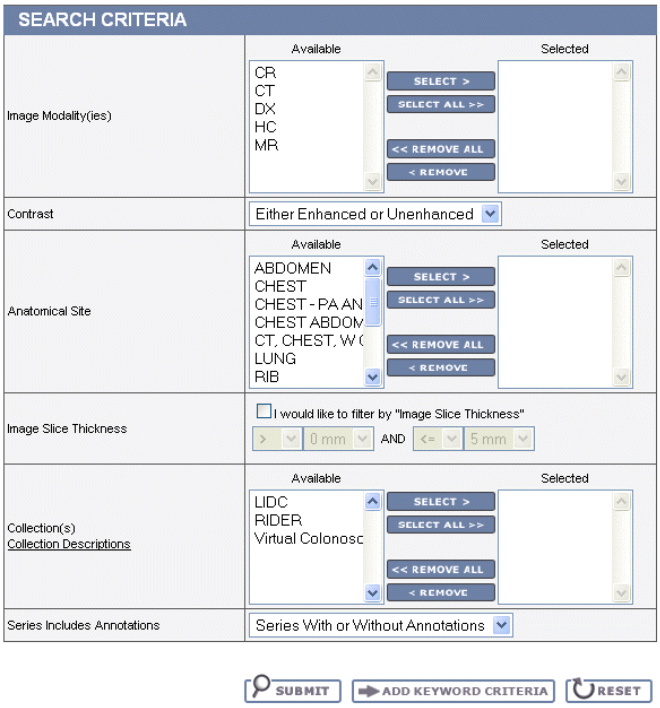


Figure 2.3 Simple Search Criteria.

2. Choose the search criteria described in *Table 2.1*

Simple Search Criteria	***Description***
Image Modality(ies)	Select from the available image classifications. If none are selected, then the search returns data for all modalities.
Contrast	Select from the drop-down list: • **Enhanced** • **Un-enhanced** • **Either Enhanced or un-enhanced**
Anatomical Site	Select from the available anatomical sites. If none are selected, then the search returns data for all anatomical sites.

Table 2.1 Simple Search criteria

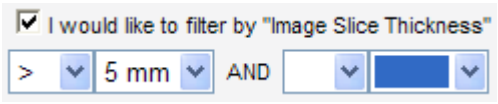
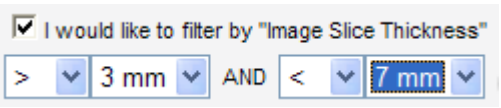
Simple Search Criteria	Description
Image Slice Thickness	Select **Image Slice Thickness** to allow you to select a thickness range or number. Use the first set of drop-down boxes only to select one thickness by using (=), greater than (>) or greater than or equal to (>=) to a selected thickness. For example, for a thickness greater than 5mm, select the following:  Use both sets of drop-down boxes to select a range of numbers. For example, for a range between 3mm and 7 mm, select the following:  If you do not select this, then the search returns data for all image slice thicknesses.
Collection(s)	Collections are NCI-defined groupings of image data sets. Select from the available collections. Select from the available collections. If none are selected, then the search returns data for all collections. Click **Collection Descriptions** for more information about the collections.
Annotations	Select **Only include series that have annotations** to search for annotations. If you do not select this, then the search returns series that have annotations and do not have annotations.

Table 2.1 Simple Search criteria (Continued)

Note: *Table 2.2*displays a list of DICOM mappings for search fields.

Labels from the Simple Search Page	DICOM Attribute Tag Numbers	DICOM Attribute Tag Names
Image Modality	(0008, 0060)	Modality
Contrast	(0018, 0010)	contrastBolusAgent
Anatomical Site	(0018, 0015)	Body Part Examined
Image Slice thickness	(0018, 0050)	Slice Thickness
Collections	(0013, 0010)	Project Name
Series Includes Annotations	NA	NA

Table 2.2 DICOM Mappings for search fields

3. Click the appropriate button to initiate, enhance or reset the search.
    a. Click **Submit** to start the search. The Search Criteria and Search Results (by Subject) pages display (see *Viewing Search Results* on page 31).
    b. Click **Add Keyword Criteria** to search curation data with selected keywords. This option takes you to the Annotation Keyword Search page. See the following section.
    c. Click **Reset** to reset the search criteria to their default values.

After a search is submitted, if you specified to search remote image databases, the Remote Site(s) Selected table lists those sites. Search criteria are summarized in a Criteria Selected table. For more information about search results, see *Viewing Search Results* on page 31.

Searching Curation Data

NCIA allows you to submit either image files (DICOM) or annotation files. Annotation files are typically either markup XML (files describing lines drawn on an image) or reports of some kind (for example, pdfs of radiologist reports). The image data is parsed into the database and is searchable on the Simple or Advanced Search pages. Data in the annotation fields is not searchable: you can only search to see whether or not series containing images also have associated annotation files. (This is the **Series with Annotations Only** field on the Simple Search page.)

To make the data in NCIA more valuable to researchers, NCI has a curator who looks at the images and creates "curation data" about them. This could be clinical outcomes (patient survived or died?) or analysis (number of lesions, etc). The curation data is uploaded into NCIA by someone with Manage Visibility permissions using the Upload Curation Spreadsheet feature. For more information, see *Uploading and Parsing the Curation Spreadsheet* on page 45. Once the data has been uploaded, the curation data is available for search on the Annotation Keyword Search page. See the following section.

Annotation Keyword Search Page

Note: In an annotation keyword search, there are no user defined keywords. You will select from among predetermined keywords based on terms and values in source image collections.

To perform an annotation keyword search, follow these steps:

1. Click the **Add Keyword Criteria** button on either the Simple Search page or the Advanced Search page.

This opens the Annotation Keyword Search page, that displays any criteria you selected on the previous search page. (*Figure 2.4*).

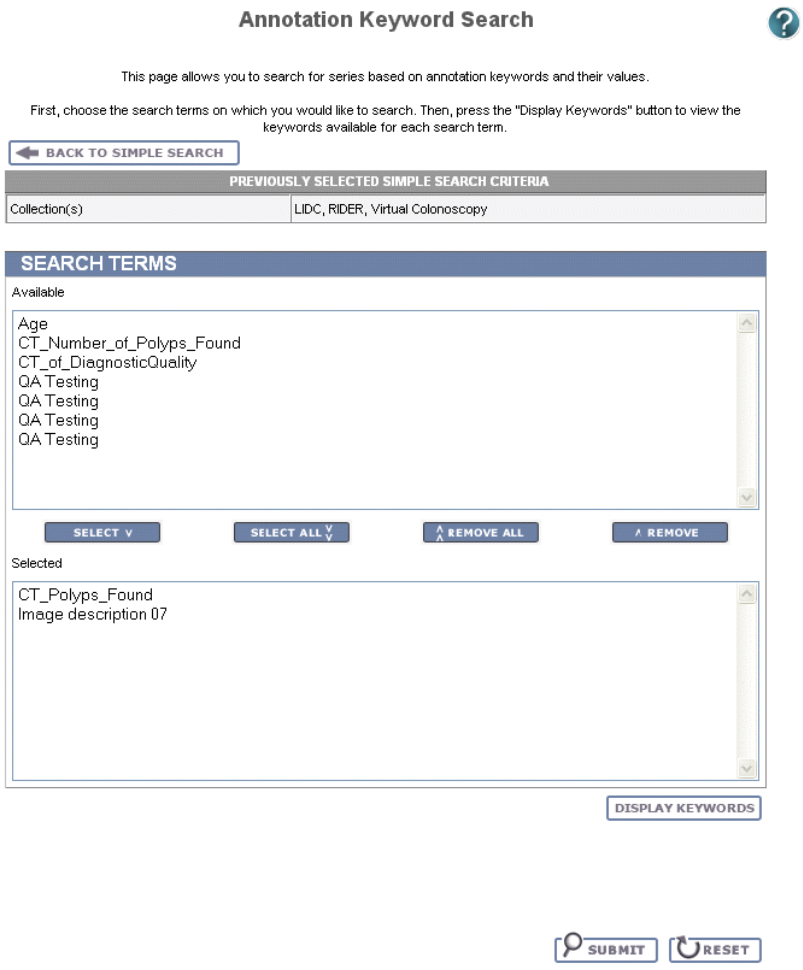


Figure 2.4 Annotation Keyword Search page

Note: If before you started your search, you specified a remote site to be searched (*Specifying Remote Search Sites*), when you open the page, the Remote Sites Selected table lists the sites to be searched outside the local NCIA imaging archive.

2. At any point, click the **Back to Simple Search** or **Back to Advanced Search** buttons to return you to the previous page. The search criteria you have already defined still display.
3. The **Search Terms Available** select box displays a list of all search terms found for collections you selected on the previous page. Use the **Select** or **Select All** buttons to move one or more of those to the **Selected** box.
4. You can click **Submit** to execute the search at this point

   OR
5. You can click the **Display Keywords** button to display the keywords for the selected search terms and drill down to more detailed search criteria.

6. Identify keywords in the Search Terms dialog box and move them to the Selected pane as described in step #3.
7. You can click **Submit** to execute the search at this point

   OR

8. You can click the **Display Keywords** button again to display the keywords for the selected search terms and drill down to more detailed search criteria (*Figure 2.5*).

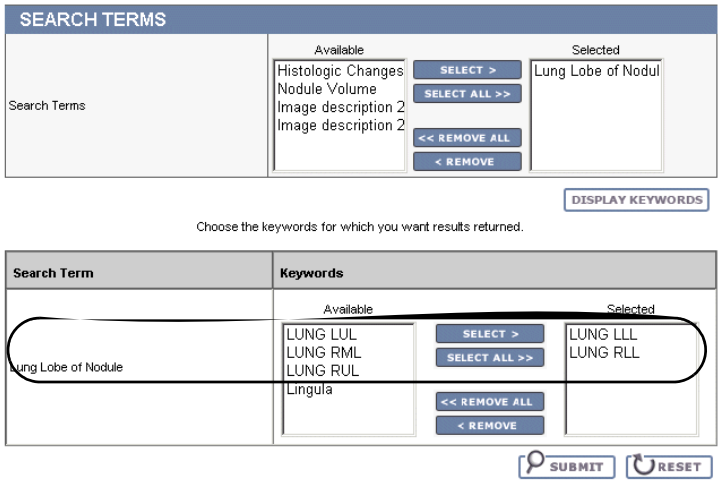


Figure 2.5 Expanded Annotation Keyword Search page

   a. At this point, additional keywords (CDEs) to your search terms have been added in the **Available** panels. Move any terms you want to add to your criteria to the appropriate selected boxes.
   b. If the available data is numeric, define the data from a range field (circled in *Figure 2.5*).
9. Once you have finished defining criteria, click **Submit** to execute the search.
10. Click **Reset** to clear fields of all criteria. This moves you back to the initial Annotation Term Search page. The criteria you selected in the Simple or Advanced Search pages still displays in summarized table format.

Searches are based on criteria named on Simple or Advanced Search pages, plus criteria specified on this Annotation Keyword Search page.

Results display as described in *Viewing Search Results* on page 31.

Performing an Advanced Search

An Advanced Search has all fields available for a Simple Search, as well as expanded options. All advanced searches are made at the series level from the Advanced Search page.

To perform an Advanced Search, follow these steps:

1. Initiate the search by following one of these options:
   - Click the **Advanced Search** link in the Welcome panel of the NCIA home page.

- Click the **Advanced Search** link on the Simple Search page. Criteria that you may have already selected on the Simple Search page displays on the Advanced Search page.

These options open the Advanced Search page. The Remote Sites Selected table at the top of the page lists the remote databases you may have selected to be searched outside the local NCIA imaging archive (*Figure 2.2*).(See *Specifying Remote Search Sites* on page 15.)

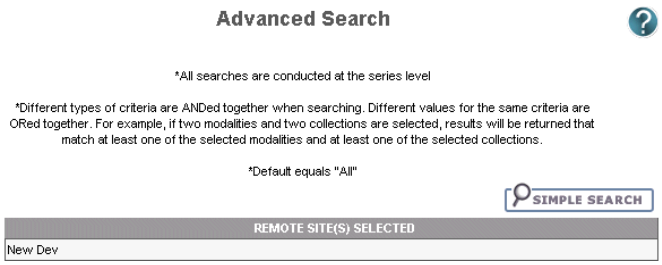


Figure 2.6 Advanced Search page (top)

The remainder of the Advanced Search page displays the search criteria (*Figure 2.7*).

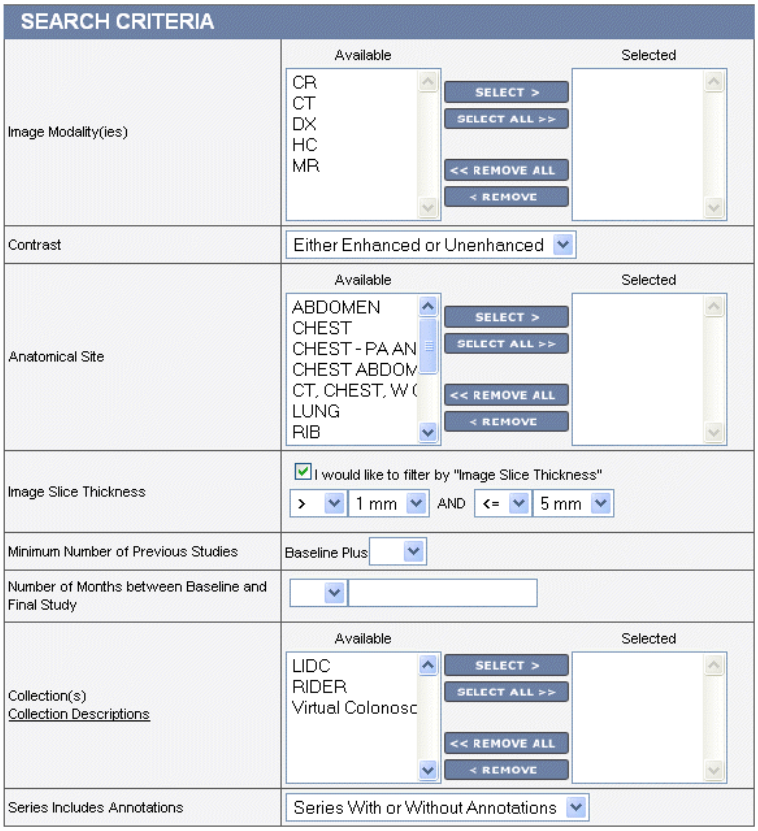


Figure 2.7 Advanced Search page

2. Choose the search criteria as described in *Table 2.3*.

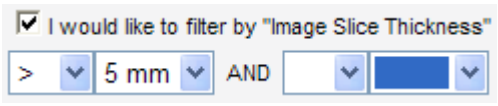
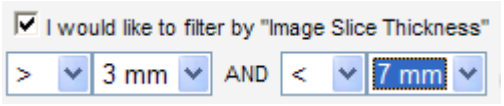
Advanced Search Criteria	***Description***
Image Modality(ies)	Select from the available image modalities. If none are selected, then the search returns data for all modalities.
Contrast	Select from the drop-down list. For example, • Enhanced • Un-enhanced • Either Enhanced or un-enhanced
Anatomical Site	Select from the available anatomical sites. If none are selected, then the search returns data for all anatomical sites.
Image Slice Thickness	Select **I would like to filter by Image Slice Thickness** to allow you to select a thickness range or number. Use the first set of drop-down boxes only to select one thickness by using (**=**), greater than (**>**) or greater than or equal to (**>=**) to a selected thickness. For example, for a thickness greater than 5mm, select the following:  Use both sets of drop-down boxes to select a range of numbers. For example, for a range between 3mm and 7 mm, select the following:  If you do not select this, then the search returns data for all image slice thicknesses.
Previous Minimum Number of Studies	Patients are selected if more than the entered number of studies has been performed on the patient. It is specified as baseline (first visit) plus the number of subsequent visits. Select a number from the drop-down list.
Number of Months between Baseline and Final Study	This allows selection of cases with the desired amount of follow-up. Select equal (**=**), greater than (**>**), greater than or equal to (**>=**), less than (**<**) or less than or equal to (**<=**) from the drop-down list and enter the desired number of months.
Collection(s)	Collections are NCI-defined groupings of image data sets. Select from the available collections. Select from the available collections. If none are selected, then the search returns data for all collections. Click **Collection Descriptions** for more information about the collections.

Table 2.3 Advanced Search Criteria

Advanced Search Criteria	Description
Annotations	Select **Only include series that have annotations** to search for annotations. If you do not select this, then the search returns series that have annotations and do not have annotations.

Table 2.3 Advanced Search Criteria (Continued)

3. Choose the modality manufacturer search criteria as shown in *Figure 2.8* and described in *Table 2.4*.

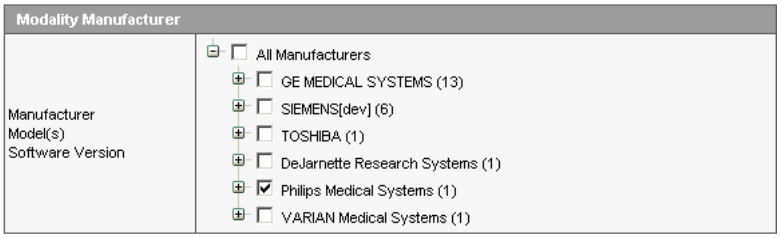


Figure 2.8 Modality Manufacturer Search Criteria

Criteria	Description
Manufacturer **Model** **Software Version**	This option displays a tree view of the manufacturers, models and software versions for the image modality. The number in parentheses indicates the number of items under that branch of the tree. • Click on the plus sign to expand a branch of the tree or click on the minus sign to collapse a branch of the tree. • Select a manufacturer, model or software version for your search by clicking in the box next to the item. Any items under the branch you selected are automatically selected for you. For example, Phillips Medical Systems was selected above. If none are selected, then the search returns data for all manufacturers.

Table 2.4 Modality Manufacturer Search Criteria

4. Choose the DICOM search criteria as shown in *Figure 2.9* and described in *Table 2.5*. For more information on DICOM, see http://medical.nema.org/.

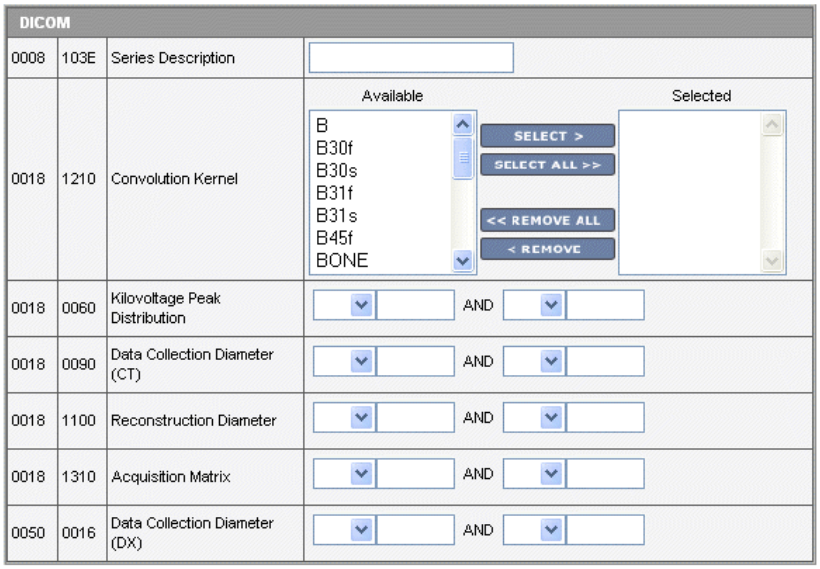


Figure 2.9 DICOM Search Criteria

Criteria	*Description*
Series Description	Enter your description of the Series. The Series Description is a DICOM tag with a group number of 0008 and element number of 103E.
Convolution Kernel	Select from the available convolution kernels. Convolution kernel is a label describing the convolution kernel or algorithm used to reconstruct the data. The DICOM tag group number is 0018 and the element number is 1210. If none are selected, then the search returns data for all convolution kernels.
Kilovoltage Peak Distribution	Kilovoltage Peak Distribution is the kilo voltage output of the x-ray generator used by a modality. The DICOM tag group number is 0018 and the element number is 0060. The DICOM attribute name is KVP. Use the first set of drop-down boxes only (before the AND) to select a peak distribution by using (**=**), greater than (**>**) or greater than or equal to (**=>**). Use both sets of drop-down boxes to select a range of numbers. From the first drop-down box, select greater than (**>**) or greater than and equal to (**=>**) and specify a peak distribution. Then, select less than (**<**) or less than and equal to (**=<**) form the second drop-down list and specify the maximum peak distribution.

Table 2.5 DICOM Search Criteria

5. Click the appropriate button to initiate, enhance or reset the search.

a. Click **Submit** to start the search. The Search Criteria and Search Results (by Subject) pages display (see *Viewing Search Results* on page 31).

b. Click **Add Keyword Criteria** to enhance the search with selected keywords. This option takes you to the Annotation Keyword Search page. For more information, see *Searching Curation Data* on page 20.

c. Click **Reset** to reset the search criteria to their default values.

After the search is submitted, search criteria are summarized in a Criteria Selected table. Search results display below the table. For more information about search results, see *Viewing Search Results* on page 31.

Working with Saved Search Queries

After you launch a search, the Search Criteria page displays the search criteria summary for your review. It allows you to save the query for future use. A text field for entering the query name and a **Save Query** button displays below the search criteria (circled in *Figure 2.10*).

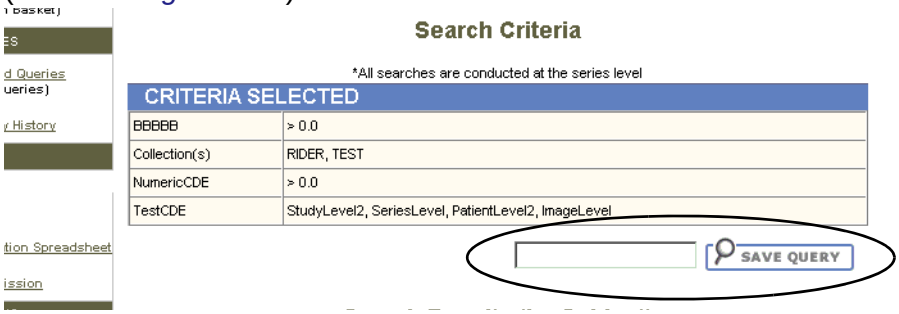


Figure 2.10 Save Query option

Note: If you launched the search from a previously saved query, then the text field and **Save Query** buttons do not display.

Saving a Search Query

To save a search query, perform the following steps:

1. Enter a name for the saved query in the **Save Query** text field.
2. Click the **Save Query** button.

NCIA attempts to save the query and displays a message that indicates the success or failure and suggests any additional actions that are required.

Managing Saved Queries

Click the **View Saved Queries** link in the left sidebar of the viewer to display the Saved Queries page (*Figure 2.11*).

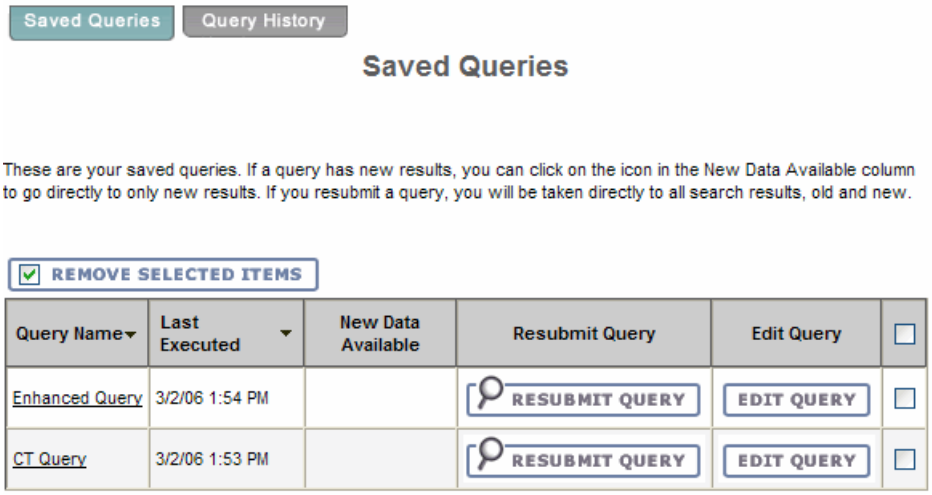


Figure 2.11 Saved Queries page

This page displays a table of all queries that are currently saved for you. Table columns are described in *Table 2.6*. The table is sorted in descending order by **Last Executed** date by default. You can also sort by **Query Name** by clicking on the down arrow next to the column title.

Saved Query	***Description***
Query Name	The name of the query displays as a link. The default is that the criteria themselves do not display. The link toggles whether the criteria for the saved query displays. Click the link to display/not display the criteria selected for the query.
Last Executed	The most recent date and time you executed the query displays. The time is displayed for the Eastern Time (US and Canada) time zone.
New Data Available	An icon appears if new data is available for the saved query. Click the icon to display the results (new data only) on the Search Results page.
Resubmit Query	Click the **Resubmit Query** button to submit the query using the saved criteria and display the results on the Search Results page. The results contain both old and new data.
Edit Query	Click the **Edit Query** button to display the Search page displaying the criteria that was saved for the query. You can then modify the criteria.
Checkbox	Click the checkbox to mark the query for deletion. You can click the checkbox in the header to select all queries or you can select queries individually.

Table 2.6 Saved Query descriptions

You can perform the following actions on the Saved Queries page.

- **Remove Selected Items**--Check the box corresponding to any Saved Query line items and click the **Remove Selected Items** button to delete selected saved queries.

  After NCIA attempts to delete the queries, it returns you to the **Manage Saved Queries** page; a message displays that indicates the success or failure and suggests any additional actions that are required.

- **View Query History**--Click the **Query History** tab to display the View Query History page (see *Viewing a Query History* on page 30).
- **Resubmit a Saved Query**--If you resubmit a saved query, the name of the saved query displays on the Search Results page with the following message:

  These are the results of the {Name} saved query.

  If the query is executed for new data only, the following message appears:

  These are the results of the {Name} saved query (new data since {Date} only).

  {Date} is the last execute date used as part of the criteria of the query to make it only display new results.

Editing Saved Queries

Note: You cannot edit the name of a saved query. You can, however, re-run the query and save this as a new query with a new name. You can then go back and delete the old query.

Perform the following steps to edit a saved query.

1. Click the **Edit Query** button from the Saved Queries page (*Figure 2.11 Saved Queries page* on page 28) to display the Search page containing the criteria that was saved for the query. The name of the saved query being edited is shown in the following information message:

   Saved query {Name} is being edited. After pressing Submit and viewing the results, you will have the option to save the changes.

2. Edit the criteria for the saved query and click **Submit**.
3. The Search Criteria page (*Figure 2.12*) displays the criteria and the Search Results page displays the results for the edited criteria.

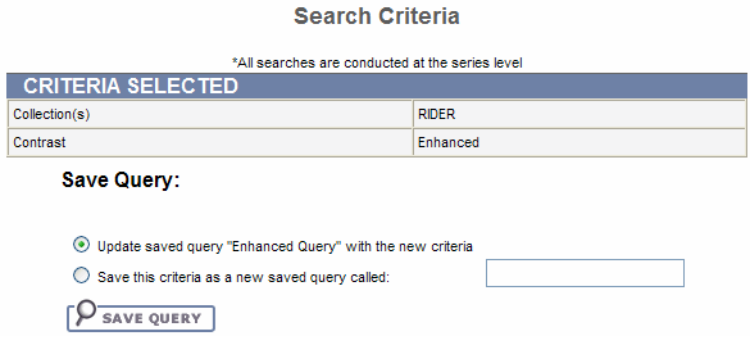


Figure 2.12 Save Edited Query

4. Choose one of the following choices (see *Figure 2.12*).
   a. Select **Update saved query {Query Name} with the new criteria** and click **Save Query**.
   b. Select **Save this criteria as a new saved query called**, enter a new query name and click **Save Query**.
   c. If you do not like the results returned by the criteria, navigate back to the Search page to try again.

   If you clicked the **Save Query** button, the system attempts to save the query and displays a message which indicates the success or failure and performs any additional actions that are required.

Viewing a Query History

Click the **View Query History** link in the left sidebar or the **Query History** tab from the Saved Queries page to display the Query History page (see *Figure 2.13*). The Query History page displays a table of the last twenty queries that you executed which includes queries that are not saved and saved queries that are resubmitted.

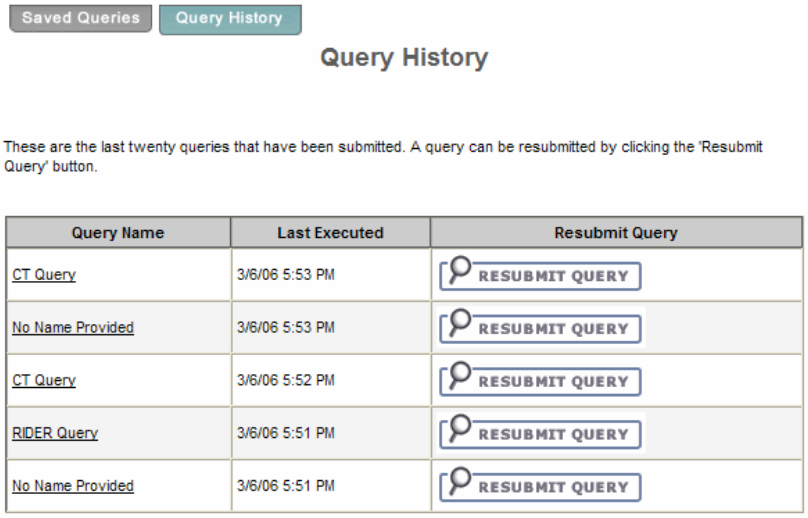


Figure 2.13 Query History page

The Query History table contains the data in *Table 2.7*.

Field Name	Description
Query Name	The name of the query displays as a link. The link toggles whether the criteria for the saved query is displayed. The text of the link can appear three different ways depending on the situation • If the query was not saved, **No Name Provided** displays as the link. • If the query is a saved query that has not been edited since the last execution date, the name of the saved query is displayed. • If the query is a saved query that has been edited since the last execution date, the name of the saved query is displayed with an asterisk. The asterisk refers to a message at the bottom of the page which is a warning to you that the results are based on the criteria that were used at the time the query was run, not the criteria that is currently saved for the query.
Last Executed	The date and time that you executed the query. The time is displayed for the Eastern Time (US & Canada) time zone.
Resubmit Query	Click the **Resubmit Query** button to submit the query using the saved criteria. The results display on the **Search Results** page (see *Viewing Search Results* on page 31).

Table 2.7 Query History

Click the **Saved Queries** tab to display the Saved Queries page (see *Managing Saved Queries* on page 28).

Viewing Search Results

In reviewing search results, it is important to review the hierarchy of submissions in NCIA.

Clinical trial > Patient (Subject) > Study > Series > Images

Search results display first as *Search Results (by Subject)*. As you click on **Show Studies** links in those results, NCIA drills down to *Search Results (Studies for Subject)* where more details for studies display. From these results, when you click **Show Images** links, the *Search Results (Images for Series)* display, revealing thumbnail images within a series.

Note: At any point in the process of reviewing results, you can add items--the entire patient, a study, a series, or specific images--to your data basket by selecting the items and clicking the **Add to Basket** button. This identifies objects to be downloaded.

When you download a series that have annotation files (indicated by **Yes** in the **Contains Annotations** column), they are automatically downloaded as well.

Search Results (by Subject)

The Search Results (by Subject [patient]) page displays a table containing the results of the search by subject (*Figure 2.14*). At the bottom right, the numbered sequence of hits in the visible list displays as well as the number of entire hits.

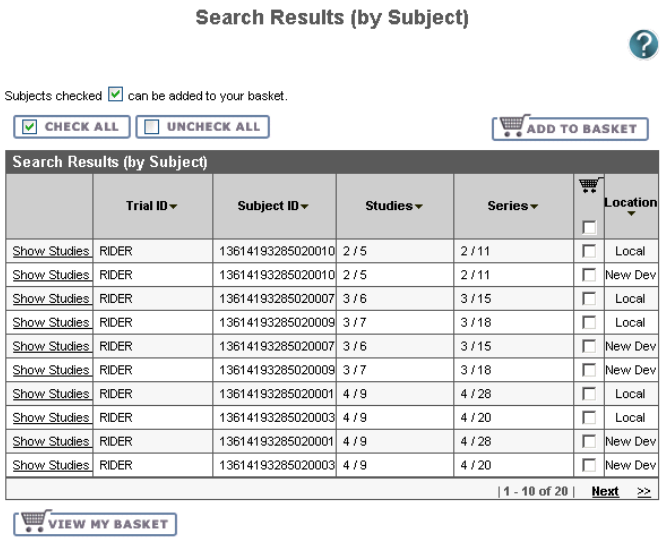


Figure 2.14 Search Results by Subject

Table 2.8 describes each item in the Search Results (by Subject) table.

Search Result	*Description*
Show Studies	Click this hypertext link to display the studies for this subject.
Trial ID	Trial identification number
Subject ID	Subject identification number
Studies	Contains two numbers: the number of studies that met the criteria / total number of studies for the subject
Series	Contains two numbers: the number of series that met the criteria / total number of series
Checkbox	Click the checkbox to mark the result for addition to your data basket. Click the checkbox in the header to select all results, or you can select results individually.
Location	The location of the image "Local" represents the NCIA imaging archive that you are currently logged into. Other locations are remote sites selected with the Remote Search option. For more information about the Remote Search option, see *Specifying Remote Search Sites* on page 15.

Table 2.8 Search Results (by Subject)

1. Click any **Show Studies** links to display the studies for this subject where more details for studies display. See *Search Results (Studies for Subject)* on page 33.

   Note: If you submitted a query that includes collections to which you do not have access, the following message displays:

   Results for the [Collection Name] collection are not included in the results because you do not have access to that collection.

   Some search results may display, but results from the disallowed collection are not included. If you specified multiple disallowed collections, the message appears once for each collection.

   This situation can occur when you save a query. If a query is saved when you have access to a collection and then resubmit the query later (after your access to the collection has been revoked), the system still has the disallowed collection criteria saved.

2. You can perform the following actions on the Search Results (by Subject) page (*Figure 2.14*).
   - Click the down arrow next to a column title to sort the column by that item.
   - Click the **Previous** (or **<<**) and **Next (**or **>>**) buttons at the bottom of the table to display the previous or next set of results. The numbers of the results displayed is shown.
   - Click the **Add to Basket** button to add items selected to your data basket (see *Adding Items to Your Basket* on page 36).
   - Click **View My Basket** to display the items in your data basket (see *Managing the Data Basket* on page 37).

Search Results (Studies for Subject)

When you click a study in the *Search Results (by Subject)* page, the Search Results (Studies for Subject) page opens. This page displays specific information for each study: the **Study ID**, **Date** and **Description** followed by a table containing the details for each study (*Figure 2.15*).

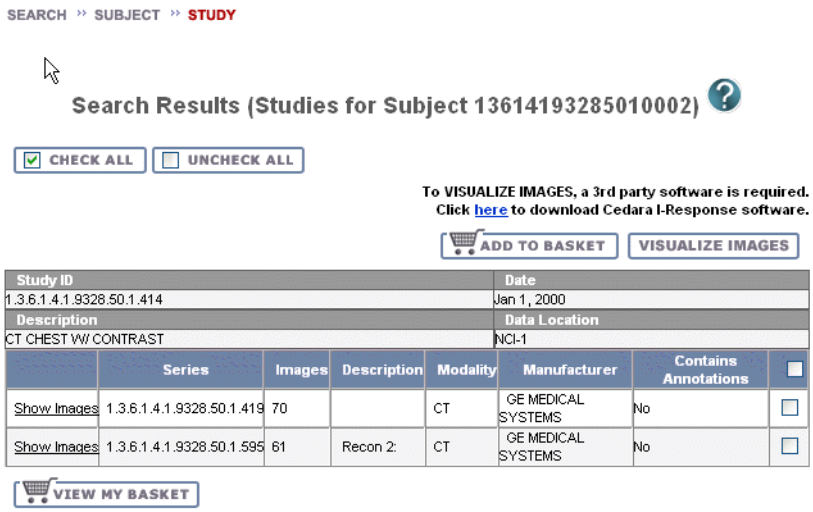


Figure 2.15 Studies for Subject Search Results

Table 2.9 describes each item in the Search Results (Studies for Subject) table.

Search Result	*Description*
Show Images	Click this link to display the images for the series. For more information, see *Search Results (Images for Series)* on page 35.
Series	Series ID
Images	Number of images for that series which can be displayed by clicking the **Show Images** link. This number includes both visible images that meet the criteria and those that do not. For example, where "3/4" displays, there are 4 studies total for the patient, and 3 of those 4 have images that met the search criteria.
Description	Description of the Series
Modality	Modality
Manufacturer	Name of the manufacturer
Contains Annotations	Displays **Yes** or **No,** revealing if there are annotation files. **Yes** becomes a hypertext link if the series has corresponding annotations for which the content type has been identified by curators. Hover over or click the link to display the annotation content type(s). If annotation files are available, but the content type is not known, **Yes** displays but is not hypertext.
Checkbox	Click the checkbox to mark the result for addition to your basket. You can click the checkbox in the header to select all results or you can select results individually.

Table 2.9 Studies for Subject Search Results

- To visualize images identified on the search results page, you must have the Cedara I-Response Workstation (IRW) installed on your system.

  Note: If you do not have the IRW installed, go to the NCICB Download page, http://ncicb.nci.nih.gov/download. Once the Download page appears, click **N** to find NCIA, and then click the IRW download link.

1. Click the **Visualize Images** button to open the IRW window and visualize images in the data basket. For complete instructions on how to use the IRW, refer to the Cedara online help.
2. You can perform the following additional actions on the Search Results (Studies for Subject) page.
   - Click the **Check All** or **Uncheck All** buttons to check or uncheck all items on the search results page or click the checkboxes individually.
   - Click the **Add to Basket** button to add items selected to your data basket (see *Adding Items to Your Basket* on page 36).
   - Click **View My Basket** to display the items in your data basket (see *Managing the Data Basket* on page 37).

Search Results (Images for Series)

When you click the **Show Images** link in the *Search Results (Studies for Subject)* page, this opens the Search Results (Images for Series) page. This page displays images for the corresponding series you selected. A table contains information defined for the series, followed by thumbnail images for that series (*Figure 2.16*).

Figure 2.16 Images for Series Search Results

Table 2.10 describes each item in the Search Results (Images for Series) table.

Search Result	*Description*
Subject ID	Subject identification number
Study ID	Study identification number
Date	Date
Modality	Modality
Manufacturer	Name of the manufacturer
Contains Annotations	Displays **Yes** or **No,** revealing if there are annotation files. **Yes** becomes a hypertext link if the series has corresponding annotations for which the content type has been identified by curators. Hover over or click the link to display the annotation content type(s). If annotation files are available, but the content type is not known, **Yes** displays but is not hypertext.

Table 2.10 Images for Series Search Result fields

You can perform the following actions on the Search Results (Images for Series) page:

- To enlarge an image, float your cursor over an image thumbnail. A larger version of the image displays in the upper right hand corner of the page.
- To check or uncheck all items on the search results page, click the **Check All** or **Uncheck All** buttons. To select individual images, click the image thumbnail checkboxes individually.
- Click the **Add to Basket** button to add selected items selected to your data basket (see *Adding Items to Your Basket* on page 36). Images that you add become highlighted.
- Click **View My Basket** to display the items in your data basket (see *Managing the Data Basket* on page 37).

Working with the Data Basket

As you review search results in NCIA, you can add items at any level to your data basket for subsequent download.

Adding Items to Your Basket

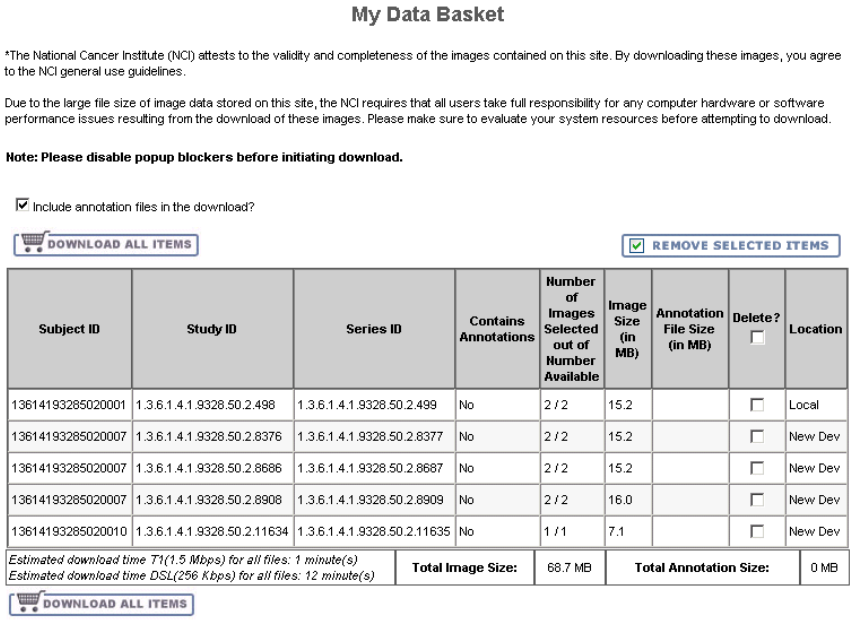
You can add items to your basket at the subject [patient], study, series and images levels.

1. To select items, use the **Check All** and **Uncheck All** buttons above the search results tables to check or uncheck all items on a given search results page or click the corresponding checkboxes for items individually.
2. When satisfied, click the **Add to Basket** button.

   The items added to the basket are highlighted.

Managing the Data Basket

Click the **View Contents** link in the left sidebar, **Manage Data Basket** from the top menu bar or the **View My Basket** button from Search Results pages to display the My Data Basket page. This page displays a table of all the items in your data basket (*Figure 2.17*).



My Data Basket

*The National Cancer Institute (NCI) attests to the validity and completeness of the images contained on this site. By downloading these images, you agree to the NCI general use guidelines.

Due to the large file size of image data stored on this site, the NCI requires that all users take full responsibility for any computer hardware or software performance issues resulting from the download of these images. Please make sure to evaluate your system resources before attempting to download.

Note: Please disable popup blockers before initiating download.

Include annotation files in the download?

DOWNLOAD ALL ITEMS | REMOVE SELECTED ITEMS

Subject ID	Study ID	Series ID	Contains Annotations	Number of Images Selected out of Number Available	Image Size (in MB)	Annotation File Size (in MB)	Delete?	Location
13614193285020001	1.3.6.1.4.1.9328.50.2.498	1.3.6.1.4.1.9328.50.2.499	No	2 / 2	15.2			Local
13614193285020007	1.3.6.1.4.1.9328.50.2.8376	1.3.6.1.4.1.9328.50.2.8377	No	2 / 2	15.2			New Dev
13614193285020007	1.3.6.1.4.1.9328.50.2.8686	1.3.6.1.4.1.9328.50.2.8687	No	2 / 2	15.2			New Dev
13614193285020007	1.3.6.1.4.1.9328.50.2.8908	1.3.6.1.4.1.9328.50.2.8909	No	2 / 2	16.0			New Dev
13614193285020010	1.3.6.1.4.1.9328.50.2.11634	1.3.6.1.4.1.9328.50.2.11635	No	1 / 1	7.1			New Dev

Estimated download time T1(1.5 Mbps) for all files: 1 minute(s)
Estimated download time DSL(256 Kbps) for all files: 12 minute(s)

Total Image Size: 68.7 MB **Total Annotation Size:** 0 MB

DOWNLOAD ALL ITEMS

Figure 2.17 My Data Basket page

Table 2.11 describes each item in the Data Basket table.

Data Basket Field	*Description*
Subject ID	Subject identification number
Study ID	Study identification number
Series ID	Series identification number
Contains Annotations	Displays **Yes** or **No,** revealing if there are annotation files. **Yes** becomes a hypertext link if the series has corresponding annotations for which the content type has been identified by curators. Hover over or click the link to display the annotation content type(s). If annotation files are available, but the content type is not known, **Yes** displays but is not hypertext.
Number of Images Selected out of Number Available	Contains two numbers: Number of Images Selected / Number Available
Image Size (in MB)	Size of the image file in megabytes
Annotation File Size (in MB)	Size of the annotations file in megabytes. This column is blank if there are no annotations.
Delete	To remove the item from the basket, select the check box and click the **Remove Selected Items** button.

Table 2.11 My Data Basket field

Data Basket Field	Description
Location	The location of the image "Local" represents the NCIA imaging archive that you are currently logged into. Other locations are remote sites selected with the Remote Search option. For more information about the Remote Search option, see *Specifying Remote Search Sites* on page 15.

Table 2.11 My Data Basket field (Continued)

The total size of your data basket and the estimated download time displays at the bottom of the My Data Basket page (*Figure 2.17*).

To delete an item from your basket, select the check box of an item and click the **Remove Selected Items** button. You can continue to add items to your data basket from the Search Results pages.

Downloading the Data Basket

Once you are satisfied with your selections, click the **Download** button.

Note: Disable popup blockers before you download the files. If you do not want to download the annotation files, uncheck the **Include annotation files in your download** check box.

The selected images can be downloaded through one of the following modes:

1. **HTTP (HTTP threshold is less than 3GB)**

   If total size is below the HTTP download threshold, a progress bar displays to show the progress of the file being zipped. As the file is zipped, the progress bar updates. Once the file is 100% zipped, enter the path (or destination) where the file should be downloaded on your local workstation. The status of the download, including the percent downloaded, displays until the download is completed.

2. **FTP (FTP threshold is greater than 3GB)**

   If the size is above the HTTP download threshold, the file will be zipped and a message displays indicating that you should expect an email with a link to download the file via FTP. Once you receive the **FTP mail** email, download the file from the FTP site using a FTP client. FTP client software that supports downloads larger than 3 gigabytes is required to download files from the FTP server.

   Links to selected tools that can provide this capability:

   Note: This list is not an endorsement of the FTP client software. You may choose your own FTP client software.

   - Windows

     Filezilla: http://prdownloads.sourceforge.net/filezilla/

     FileZilla_2_2_16_setup.exe?download

- Macintosh

  NetFinder: http://www.versiontracker.com/dyn/moreinfo/macosx/3107

  Fetch: http://fetchsoftworks.com/

Note: The use of the Macintosh FTP clients listed may require you to purchase the tools. In addition to the tools listed, there are free command line tools (type curl ftp://imaging.nci.nih.gov) included with the Macintosh.

For example, download and install the Filezilla software on your Windows system. Enter the FTP address supplied in the FTP email (for example, ftp://imaging.nci.nih.gov/) in the **Address** box. The zip files display under the **Remote Site** panel. Double-click your zip file and the transfer begins.

Obtaining DICOM Viewers

Images in the NCIA repository are stored in the medical image standard, Digital Imaging and Communications in Medicine (DICOM). A DICOM file stores the digital image along with a series of tags that contain metadata about the image such as patient ID, study ID, patient weight, anatomic site, and so forth. For more information about DICOM, see http://medical.nema.org/.

Below are selected links to freeware DICOM image viewers, provided for your convenience. This is not an endorsement of the listed viewers. Many other DICOM viewers are available on the Internet.

Note: The images in this *in vivo* image archive must be downloaded before you can view them using the viewers.

- ImageJ (runs on Linux, Mac OS 9, Mac OS X, Windows, and the Sharp Zaurus PDA): http://rsb.info.nih.gov/ij/
- OSIRIX (runs on MAC OSX): http://homepage.mac.com/rossetantoine/osirix/
- DICOMWorks (runs on PC): http://www.dicomworks.com/

Initiating Searches from Other Applications

Searches in NCIA can be launched from other applications. For more information, see *Accessing NCIA from Another Application* on page 12.

CHAPTERF
3
NCIA ADMINISTRATION

This chapter discusses administration functions in NCIA.

Topics in this chapter include:

- *Administration Functions Overview* on this page
- *Using the Quality Control (QC) Tool* on this page
- *Uploading and Parsing the Curation Spreadsheet* on page 45
- *Verifying Submitted Files* on page 46

Administration Functions Overview

Specific user privileges, called manage visibility privileges for NCIA are assigned using the User Provisioning Tool (UPT) by NCICB Application Support personnel.

Administration tools options, all of which are restricted by security, are visible only when a user with manage visibility privileges logs into NCIA. These tasks display as hypertext links under the left sidebar **Tools** menu. Their use is described in the appropriate sections that follow in this chapter.

Using the Quality Control (QC) Tool

Note: This administrative tool is available only to logged in users who have manage visibility privileges.

When an image is uploaded into NCIA, it is not made public immediately. It goes through a quality control process by a curator to ensure no private patient data is available, the image is of good quality, and so forth. The NCIA QC tool allows a curator to evaluate the submission and assign the QC status of an image.

To use the QC tool, follow these steps:

1. Click the **QC Tool** hypertext link under **Tools** on the left sidebar. This opens a page that displays a QC tool workflow.

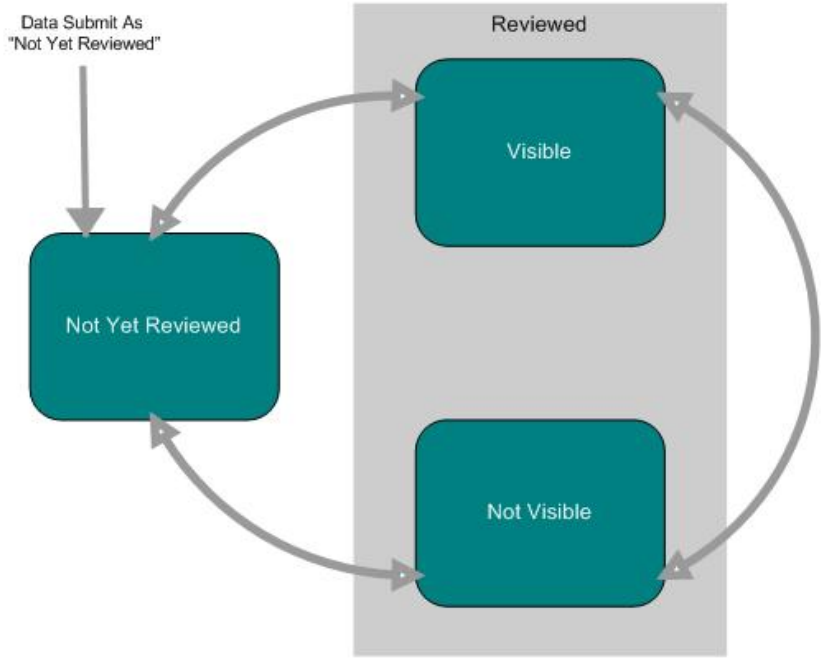


Figure 3.1 This illustration displays the workflow states of data curation

The diagram depicts the various states where data can be and the transitions between those states (*Figure 3.1*).

On the QC Tool page, the left sidebar is replaced with two categories of curation states--**Not yet reviewed** and **Reviewed**. When you click on a [+] before the

listings, a tree expands, allowing you to navigate through different visibility status, trials, patients, studies and series.

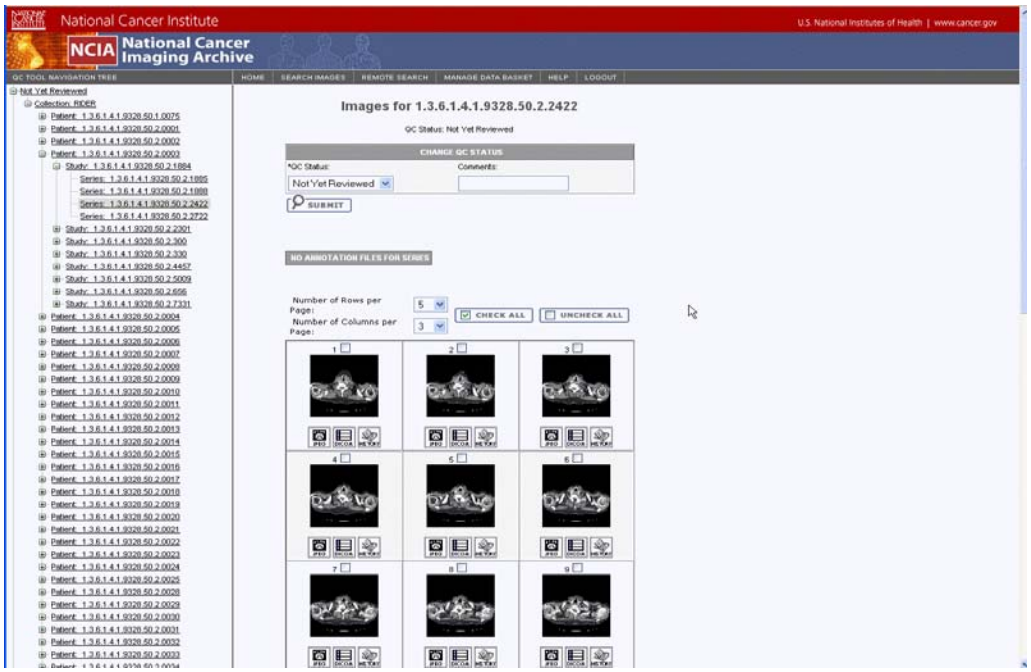


Figure 3.2 The quality control status tree; selected topics display in the right pane of the page

When you click on a node in the tree, the information associated with that selection displays in the main section of the page (*Figure 3.2*). That is the segment of the page where you can perform actions that manage the status and hence, the visibility of the selected component.

2. Click an option in the left sidebar. As a curator, follow the [+] in front of the listings to drill down through the list of patient IDs and studies to the images, shown in thumbnail (*Figure 3.2*).
3. To update the status of a tree element, select the item and the status you want to assign to it.

   Three status options are available. They are described in the following table:

Submitted Object Status	***Description***
Not Yet Reviewed	This status is automatically assigned an image upon submission to the NCIA database.
Not Visible	Images are submitted but not yet visible.
Visible	Images are visible.

Table 3.1 Status options for NCIA images

Note: While still on this page, you can select other groups to which you assign different visibilities.

The QA status history that displays shows all changes that have been made to the status of this image. When a change is made to data status in NCIA, an email is automatically generated to the user.

Note: Because changes in image status occur instantaneously, they do not generate an email.

4. Click **View DICOM Header** to view the DICOM header information. This also opens in another browser in table format. For more information about DICOM, see http://medical.nema.org/
5. To view a full-size copy of the image in JPEG format, click the **View Full Size JPEG** button.
6. The image page also displays an audit trail of the image, the date(s) and person(s) who made changes to the image, associated comments, and the status of the image.

Updating Curation Status

Note: This administrative feature is available only to logged in users who have manage visibility privileges.

1. To update the status of a tree element, in the left pane of the QC tool navigation pane, select the item to open the corresponding page in the right pane. See *Using the Quality Control (QC) Tool* on page 41.
2. In the top segment of the pane, in the Change QC States section, select from the drop-down list the status you want to assign to the Patient, Study or Images.

   Three status options are available. They are described in *Table 3.2*

Submitted Image Status	*Description*
Not yet reviewed status	This status is automatically assigned an image upon submission to the NCIA database.
Not Visible	Images are submitted but not yet visible
Visible	Images are visible

Table 3.2 Quality control status categories

3. Enter appropriate comments and click **Submit**.

   Note: While still on this page, you can select other groups to which you assign different visibilities.

   The QC status history that displays shows all changes have been made to the status of this image. When a change is made to data status in NCIA, an email is automatically generated to the user.

Note: Changes in image status do not generate an email because the change is implemented instantaneously.

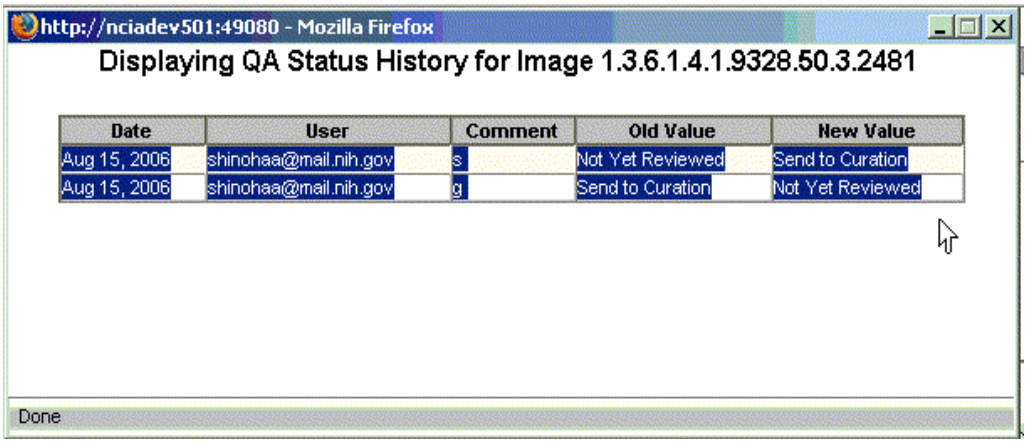


Figure 3.3 QA Status History

4. Click on **View DICOM Header** to view the DICOM header information. This also opens in another browser in table format.
5. To view a full-size copy of the image in JPEG format, click the **View Full Size JPEG** button.
6. The image page also displays an audit trail of the image, the date(s) and person(s) who made changes to the image, associated comments, and the status of the image.

Uploading and Parsing the Curation Spreadsheet

Note: This administration feature is available only to logged in users who have manage visibility privileges.

A user with Admin Curator privileges can upload and manage the parsing of a spreadsheet which contains annotations corresponding to images to which the spreadsheet corresponds. To perform these tasks, follow these steps:

1. Click the **Upload Curation Spreadsheet** hypertext link under **Tools** on the left sidebar.
2. On the Curation Spreadsheet Upload page that opens, navigate for the file to upload (by clicking the **Browse** button), and click **Upload**. This starts the upload/parsing process.

NCIA performs a quick and preliminary validation review. If obvious errors are discovered in the file to be uploaded, an appropriate message displays immediately on this page. If the spreadsheet passes the first round of validation, a message displays that you will receive an email when the upload is complete and parsed. That email will outline any additional errors that have been detected, if there are any.

Verifying Submitted Files

Note: This administration feature is available only to logged in users who have manage visibility privileges.

When a site submits images to NCIA, a user with manage visibility privileges can verify that the images have been received and monitor the status of the submitted images. This is accomplished in NCIA by generating a report with this information.

To verify image submission, follow these steps:

1. Click the **Verify Submission** hypertext link under **Tools** on the left sidebar.
2. On the Verify Submission page that opens, enter the appropriate information for the **Date Range** fields, **From** and **To**, in the Search Criteria form:
3. Press the **Submit** button. The search may take a few moments.

Once completed, the report displays below the Verify Submission form (*Figure 3.4*).

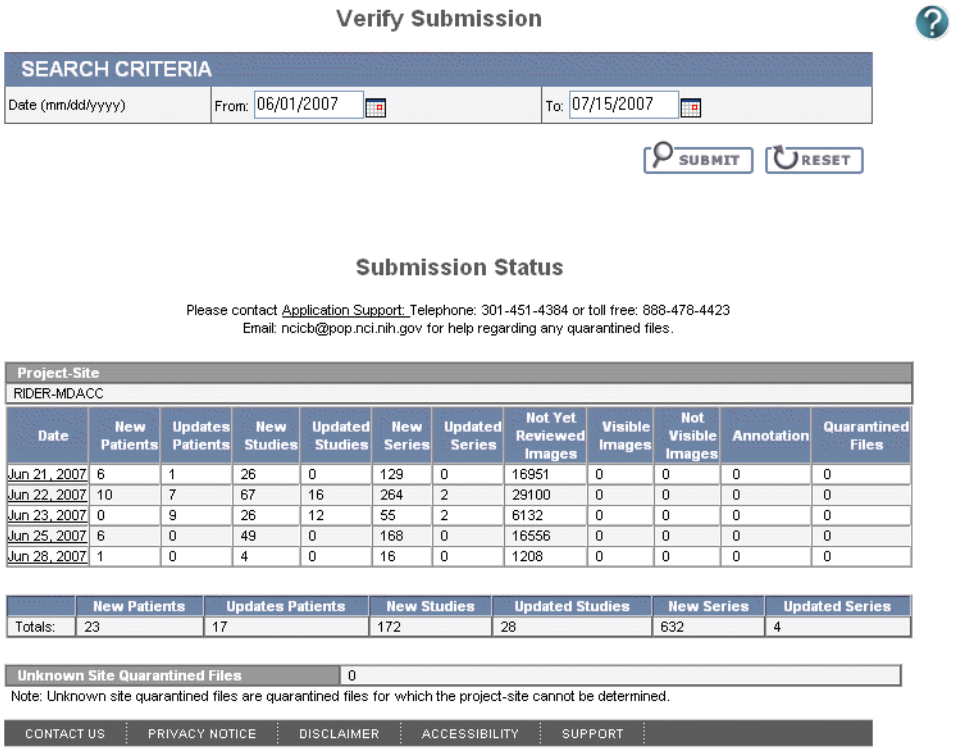


Figure 3.4 Verify Submission search criteria and search results

The results include the following summary information, grouped by project site and submission date in table format. Fields are described in *Table 3.3*:

Submitted Files Results Fields	***Description***
Date	Specific dates within the specified range on which data was submitted. Click each date, which is a link that reveals the patient, studies or series IDs for data submitted on that date.
New Patients/Updated Patients	Number of new or updated patient information represented in the search results. Click the date link for patients IDs
New Studies/Updated Studies	Number of new or updated studies represented in the search results. Click the date link for studies IDs.
New Series/Updated Series	Number of new or updated series represented in the search results. Click the date link for series IDs.
Images: • **Not Yet Reviewed** • **Visible** • **Not visible**	Number of images represented in the search results. The categories indicate review and access status for images, as determined by data curators. Click the date link for image IDs. For more information, see *Updating Curation Status* on page 44.
Annotation	Number of annotation files represented in search results
Quarantined Files	Number of quarantined files represented in search results. Files can be quarantined for a variety of reasons: an unidentified site; required values that were left blank, an invalid header, no manifest in the zip file, and so forth.

Table 3.3 Description of fields in search results for verifying submission to NCIA

On the bottom of the page, a notation displays the number of files in quarantine for which a site cannot be determined (not shown). This can occur when an uploaded file is invalid or so corrupted that the curators cannot tell where it came from.

APPENDIX

A

URL REFERENCES

This chapter lists URLs associated with NCIA.

- *FTP Client Software Products* on this page
- *DICOM* on this page
- *Cedara* on this page
- *NCIA* on page 50

FTP Client Software Products

1. Filezilla:http://prdownloads.sourceforge.net/filezilla/FileZilla_2_2_16_setup.exe?download
2. NetFinder: http://www.versiontracker.com/dyn/moreinfo/macosx/3107
3. Fetch: http://fetchsoftworks.com/

DICOM

1. DICOM: http://medical.nema.org/.
2. ImageJ DICOM Viewer: http://rsb.info.nih.gov/ij/
3. OSIRIX DICOM Viewer: http://homepage.mac.com/rossetantoine/osirix/
4. DICOMWorks DICOM Viewer: http://www.dicomworks.com/

Cedara

Cedara I-Response Workstation (IRW): http://ncicb.nci.nih.gov/download

Once the NCICB Download page appears, click **N** to find NCIA, and then click the IRW download link.

NCIA

1. NCIA access: http://imaging.nci.nih.gov
2. NCIA portal site: http://ncia.nci.nih.gov

APPENDIX

B

NCIA GLOSSARY

Acronyms referred to in this NCIA guide are described in this glossary.

Term	*Definition*
caBIG	cancer Biomedical Informatics Grid
CIP	Cancer Imaging Program
DICOM	Digital Imaging and Communications in Medicine
GUI	Graphical User Interface
HHS	Health and Human Services
NCI	National Cancer Institute
NCIA	National Cancer Imaging Archive
NCICB	National Cancer Institute Center for Bioinformatics
WAR	Web Application Resource

INDEX

A

accessing
- image collection 33
- NCIA from other application 12

Adding to Data Basket 36
Administration
- uploading, parsing spreadsheet 45
- using QA tools 41, 44
- verifying submitted files 46

Advanced Search 22
annotation keyword search 20
annotations
- downloading files 16
- file(s) associated with image 34
- files with described 20
- finding only series with 19
- keyword search 16
- predetermined keywords 20
- searching curation files 20

Application Support 13
archive, purpose 3
audience for guide 1

C

Cedara I-Response Workstation (IRW)
- URL references 49
- visualizing images in Data Basket 34

CIP, link 11
collection access 33
convolution kernel 26
criteria
- Advanced Search 24
- format of search page 17
- search summary 20
- Simple Search 18

CTEP, link 11
curation
- data search 20
- files with ... data 20

curator
- assigning curation data 20
- assigning image status 41, 44
- using QA tools 41, 44

D

Data Basket
- adding items 36
- deleting items 38
- downloading 38
- estimated download time 38
- managing 37

DCP, link 11
deleting
- items from basket 38
- saved query (removing) 29

DICOM
- DICOMWorks viewer 39
- ImageJ viewer 39
- image viewers 39
- introduction 4, 39
- mappings for search fields 19
- OSIRIX viewer 39
- references 49

digital image
- DICOM 4, 39

Downloading Data Basket 38

E

editing
- query 29

Email, FTP mail 38

F

Fetch FTP client software 39
Filezilla FTP client software 38
FTP
- client software 38
- client software products 49
- download threshold 38
- site 38

G

Glossary 51
guided tour 11

H

hierarchy of objects, NCIA 16, 31
HTTP download threshold 38

I

images
- annotations, uploading 45
- for Series, Search Results 35
- interpreting corresponding numbers 37
- Modality(ies) 24
- Slice Thickness 19, 24
- status assignment 41, 44
- thumbnails 36
- verifying submitted 46

imaging archive, purpose 3
IRW
- Cedara I-Response Workstation URL 49

K

keyword, annotation search 20
Kilovoltage Peak Distribution 26

L

launching NCIA from another application 12
login 5

M

Managing Data Basket 37
manufacturer search criteria 25
modality manufacturer 25

N

NCIA
- database search, introduction 16
- launching from another application 12
- login 5
- News page Site Map 10
- online help methods 11
- pre-login options 4
- purpose 3
- Quick Links 7
- URL references 49

NCICB Application Support 13
NetFinder FTP client software 39

O

objects in NCIA, hierarchy of 16, 31
online help 11
online tutorial 11
OSIRIX DICOM viewer 39
overview
- guide chapters 1
- NCIA 3

P

parsing annotation spreadsheet 45
performing
- Advanced Search 22
- Simple search 17

Q

QA tools, using 41, 44
quarantined files 47
Query History, viewing 30
Quick Links 7

R

registering new user 4
Remote Search 15
results
- by subject 32
- Images for Series 35
- Studies for Subject 33, 34

S

Saved Queries
- deleting (removing) 29
- editing 29
- Query History 30
- table 28
- viewing 28

search
- Advanced 22
- annotation keywords 20
- curation data 20
- introduction 16
- query, saving 27
- simple 17

search criteria
- Advanced Search 24
- modality manufacturer 25
- Simple Search 18
- summary page 27

Search page
- drop-down lists 17
- selection boxes 17
- text fields 17

Search Results
By Subject 32
Images for Series 35
Studies for Subject 33, 34
series, number of 32
Simple Search 17
Site Map 10
spreadsheet, annotations upload 45
studies, number of 32
Studies for Subject
search results 33
Studies for Subject search results 34

T

transferring FTP file 39

U

uploading annotation spreadsheet 45
user
creating account 4
login 5

V

verifying submitted images 46
viewing
Saved Queries 28
Viewing Query History 30
Visualize Images button 34
visualizing images
(Studies for Subject) 34