

NATIONAL BIOMEDICAL IMAGING ARCHIVE 4.2

User's Guide



Center for Biomedical Informatics
and Information Technology

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<i>LISTSERV</i>	<i>URL</i>	<i>Name</i>
NCIA ^a Steering	https://list.nih.gov/archives/NBIA_steering.html	NBIA Steering Discussion Forum
NCIA Developers	https://list.nih.gov/archives/NBIA_developers.html	NBIA Developers Discussion Forum

a. While the name of NCIA (National Cancer Imaging Archive) has been changed to NBIA (National Biomedical Imaging Archive), the list serv names remain “NCIA” for the time being.

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ABOUT THIS GUIDE

This section introduces you to the *NBIA 4.2 User's Guide*. It includes the following topics:

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

Purpose

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

Audience

The *NBIA 4.2 User's Guide* is the documentation for the NBIA web-based application. The intended audience for this guide are researchers including pathologists and radiologists at cancer centers, CAD developers, academia, and industry that access NBIA through commonly available web browser software.

Topics Covered

The *NBIA 4.2 User's Guide* discusses the following topics:

- *Chapter 1* provides an introduction to NBIA and describes how to access NBIA.
- *Chapter 2* describes how to search the local and any selected remote image databases.
- *Chapter 3* describes how to submit images to NBIA.
- *Chapter 4* discusses administrative functions in NBIA.
- *Appendix A* provides a list of URLs for references referred to within the text.
- *Appendix B* includes a list of abbreviations and their meanings.
- *Index* references key words and terms.

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 & Capitalized Command Capitalized command > Capitalized command	Indicates a Menu command Indicates Sequential Menu commands	Admin > Refresh
TEXT IN SMALL CAPS	Keyboard key that you press	Press ENTER
TEXT IN SMALL CAPS + TEXT IN SMALL CAPS	Keyboard keys that you press simultaneously	Press SHIFT + CTRL and then release both.
Monospace type	Used for filenames, directory names, commands, file listings, and anything that would appear in a Java program, such as methods, variables, and classes.	URL_definition ::= url_string
Icon	A toolbar button that you click	Click the Paste button () to paste the copied text.
Boldface type	Options that you select in dialog boxes or drop-down menus. Buttons or icons that you click.	In the Open dialog box, select the file and click the Open button.
<i>Italics</i>	Used to reference other documents, sections, figures, and tables.	<i>caArray User's Guide</i>
<i>Italic boldface monospace type</i>	Text that you type	In the New Subset text box, enter <i>Proprietary Proteins.</i>
Note:	Highlights a concept of particular interest	Note: This concept is used throughout the installation manual.
Warning!	Highlights information of which you should be particularly aware.	Warning! Deleting an object will permanently delete it from the database.
{ }	Curly brackets are used for replaceable items.	Replace {root directory} with its proper value, such as c:\cabio

Table i.1 NBIA User's Guide Text Conventions

GETTING STARTED IN NBIA

This chapter describes how to use NBIA.

Topics in this chapter include:

- [*Introduction to NBIA*](#) on this page
- [*Registering a New User*](#) on page 4
- [*Logging into NBIA*](#) on page 6
- [*Changing User Password*](#) on page 7
- [*Using the NCIA Portal*](#) on page 11
- [*Using NBIA Online Help*](#) on page 14

Introduction to NBIA

NBIA provides the cancer research and medical community, industry, and academia access to imaging archives 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 NBIA home page, you can search remote imaging archives located outside of the local NBIA archive.

The archive provides 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 NBIA using the CTP (Clinical Trial Processing) software. Any potential user may then access NBIA 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/>.

NBIA 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 NBIA by reading the welcome page introduction
- Open a window that provides links for downloading DICOM viewers
- Open Quick Links to web sites relevant to the goals and tasks of NBIA. See *Home Page Left Sidebar* on page 9.
- Register for a new user account.
- Log into NBIA.

Registering a New User

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

1. Click the **Register Now** hypertext link under the **Login** button.
2. Review the Legal Rules of the Road page and indicate your agreement, then click the blue **Clicking Here** link to continue.
3. In the registration form that opens (*Figure 1.1*), enter the required information for the new user. Items with an asterisk are required fields.

The screenshot shows the NBIA User Registration form. The top banner features the National Cancer Institute logo and the NBIA National Biomedical Imaging Archive title. A sidebar on the left contains links for TOOLS, QUICK LINKS, and logos for caBIG, Cancer Imaging Program, and Center for Bioinformatics. The main form area is titled 'User Registration' and includes a note about mandatory fields. The 'NAME' section has fields for Title (a dropdown menu), First Name, and Last Name. The 'CONTACT INFORMATION' section has fields for Email, Phone, Organization Name, and Fax. At the bottom right, there are 'REGISTER' and 'CANCEL' buttons.

Figure 1.1 New user registration form

- 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, a message will be conveyed to the NBIA administrator who will create the new user account in the UTP. For more information, see [Creating a New NBIA User](#) on page 57.

Using NBIA Without Logging In

You do not have to log in to access public data in NBIA. Simply begin to use the features on the Welcome page, including search functions ([Figure 1.2](#)).

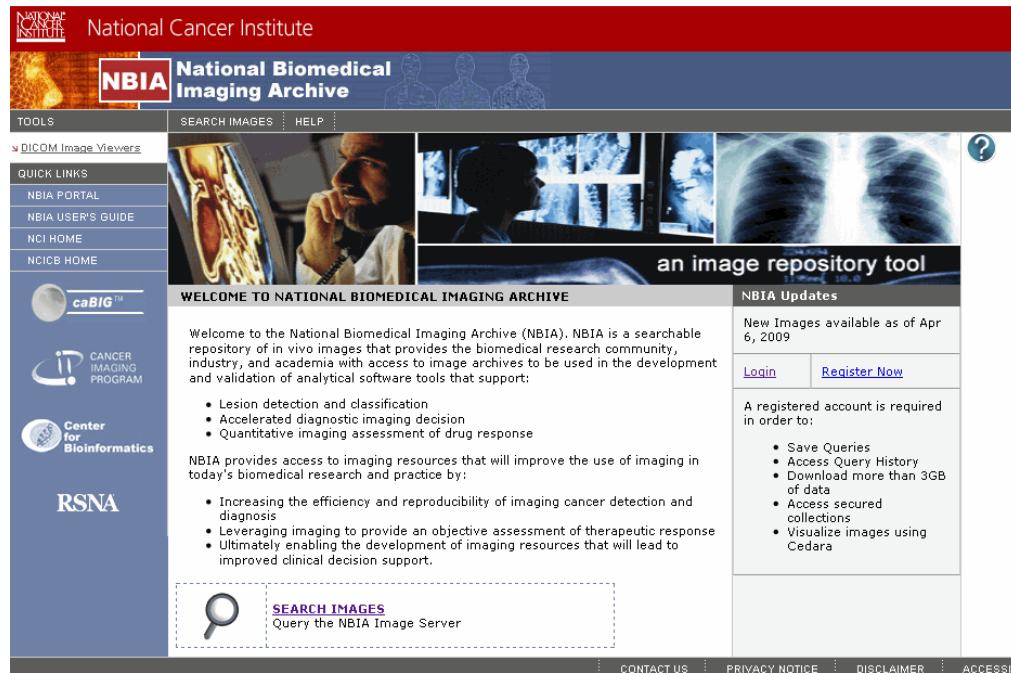


Figure 1.2 NBIA Welcome page, for guest access without logging in

You can use the search function as a “guest” without logging in. All data that NBIA returns without being logged in is public data. As a guest, you can add data to the data basket. For more information, see [Working with the Data Basket](#) on page 41.

If you are not logged into the application, some functions are unavailable: saving a search query, viewing image annotations, remote searches and visualizing images using Cedara software. You also cannot download more than 3 gigabytes of data at one time.

If the application is configured to enable the guest account access, the login section will be “hidden” by the login link by default. Additionally, you should be able to see the **Search Image** link on the home page.

Note: In some cases of local installation, the decision may have been made not to enable public data access without login. If the application is configured to disable the guest account access, the login section is “expanded” by default. If that’s the case, there is no way for the user to bypass login and perform tasks.

Logging into NBIA

When you click the <https://imaging.nci.nih.gov> to access NBIA, the welcome/login page displays.

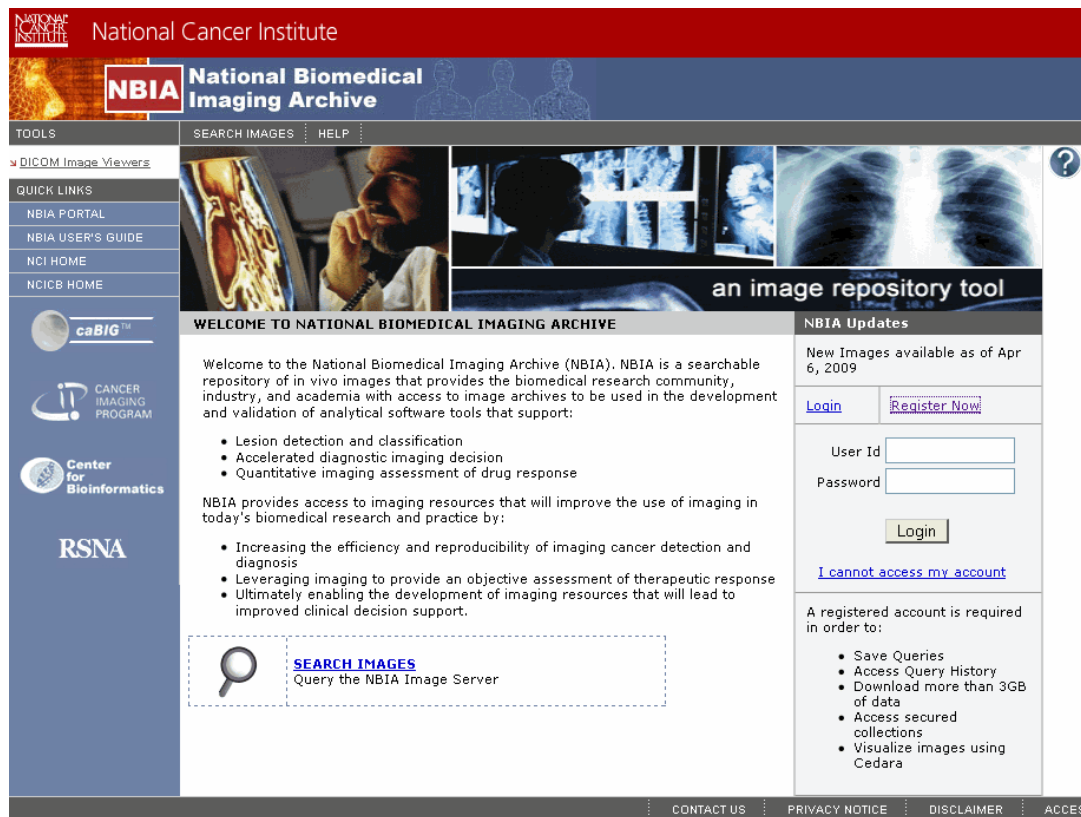


Figure 1.3 NBIA Welcome/Login page

If you have already registered with NBIA, perform the following steps to login from the User Login panel (Figure 1.3).

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

If your login is successful, NBIA opens the application to its home page.

In Case of Login Failure:

Tip: If your USERNAME or PASSWORD is not correct, “Invalid Username/password. Please try again.” displays in red text on the login page. Additionally, a popup opens, informing you of a failure to login and its possible reasons. *In your browser, you should enable a popup blocker exception for the NBIA site/URL. If you fail to do that, the login failure message may not appear.*

1. If you do not have a login ID or password, on the login page, click **Register Now** to apply for a user account. For more information, see [Registering a New User](#) on page 4.

2. If you have persistent difficulty logging in, click **I cannot access my account** on the NBIA login page. An NBIA Account Help topic opens, describing help options for resolving your login problem.
3. Follow the directions on the Login Failed pop-up message and/or on the NBIA Help Account page. Note that you can contact Application Support using the contact information on that page.

Note: If you launch a search of the NBIA database from another application, when you do so, you are brought to the NBIA login page. Use the same login instructions described in this topic.

Changing User Password

Note: The Change Password feature is only available if you are using an NCICB instance of NBIA.

Passwords for versions of NBIA prior to 3.1 will no longer work in the application. If you are a previous user, you should have received an email with a new reset password. You can continue to use the reset password, or you can change to a password of your choice. At any time during your tenure as an NBIA user, you can change the password following these directions.

To change your password, when using the NCICB instance of NBIA follow these steps:

1. Log into NBIA using the current (or reset) password.
2. On the NBIA Welcome page, click **Change Password** under the **Tools** section of the left sidebar.

Note: This option is present only in the NCICB instance of NBIA.

The change password link directs you to the NCI password station.

3. Enter your NCI User ID in the appropriate text box. Follow the directions given at this web site to change your password.

Using the NBIA Home Page

The NBIA welcome/home page that opens after login displays several panels and menu bars (*Figure 1.4*).

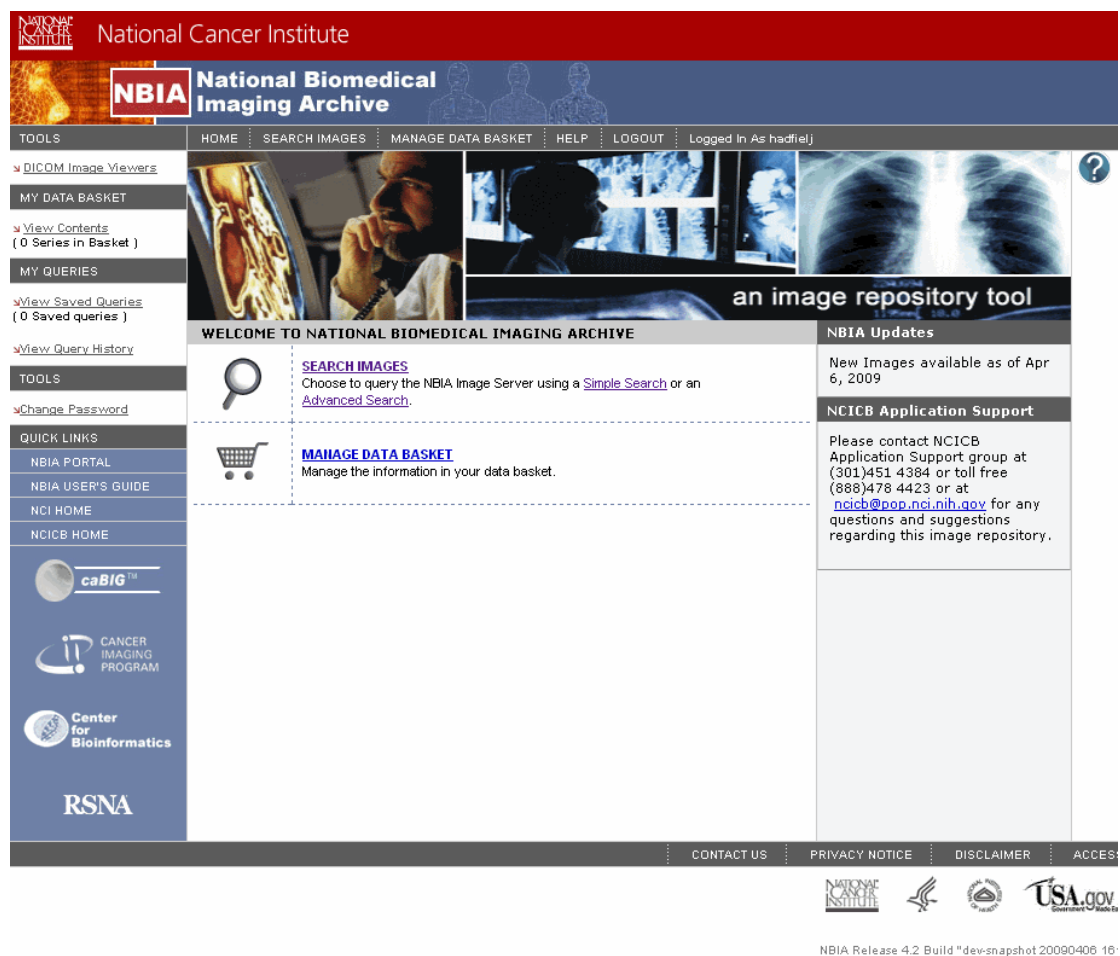


Figure 1.4 NBIA home page after login

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 NBIA Home page	N/A
Search Images	Displays the Simple Search page	Performing a Simple Search on page 18

Table 1.1 NBIA home page menu bar options

Option	Description	See for More Information
Remote Search	Displays the Search Remote Sites page This function is available only when NBIA is configured for remote image sites.	Specifying Remote Search Sites on page 29
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 41
Help	Displays a separate online Help window	Using NBIA Online Help on page 14
Logout	Logs you out of NBIA and returns you to the NBIA home page	N/A

Table 1.1 NBIA 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 44
My Data Basket > View Contents	Displays the My Data Basket page	Managing the Data Basket on page 41
My Queries >View Saved Queries	Displays the Saved Queries page	Managing Saved Queries on page 31
My Queries >View Query History	Displays the Query History page	Viewing a Query History on page 33
Tools > QC Tool	Allows a curator to evaluate a submission and assign a QC status	Using the Quality Control (QC) Tool on page 58
Tools > Upload Curation Data	Provides the means to upload and parse an annotation spreadsheet	Uploading and Parsing the Curation Spreadsheet on page 61
Tools > Verify Submission	Verifies an image submission and its status through a report	Verifying Submitted Files on page 61

Table 1.2 NBIA home page left sidebar options

Quick Links

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

Option	Description	See for More Information
Quick Links > NBIA News	Displays the NBIA News page in a separate window.	Using the NCIA Portal on page 11
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 18
Simple Search	Displays the Simple Search screen	Performing a Simple Search on page 18
Advanced Search	Displays the Advanced Search screen	Performing an Advanced Search on page 24
Remote Search	Displays the Search Remote Sites screen	Specifying Remote Search Sites on page 29
Manage Data Basket	Displays the My Data Basket page	Managing the Data Basket on page 41
Right-hand panel		
NBIA 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 14.
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

Table 1.4 NBIA home page welcome panel options

Option	Description	See for More Information
Privacy Notice	Displays the Health and Human Services (HHS) Privacy Policy Notice.	N/A
Disclaimer	Displays the NBIA Legal Rules of the Road disclaimer.	N/A
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 NBIA home page welcome panel options

Using the NCIA Portal

Note: While the appellation of NCIA changed to NBIA in early 2009, as of April 2009, the Portal page is still called “National Cancer Imaging Archive (NCIA).”

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

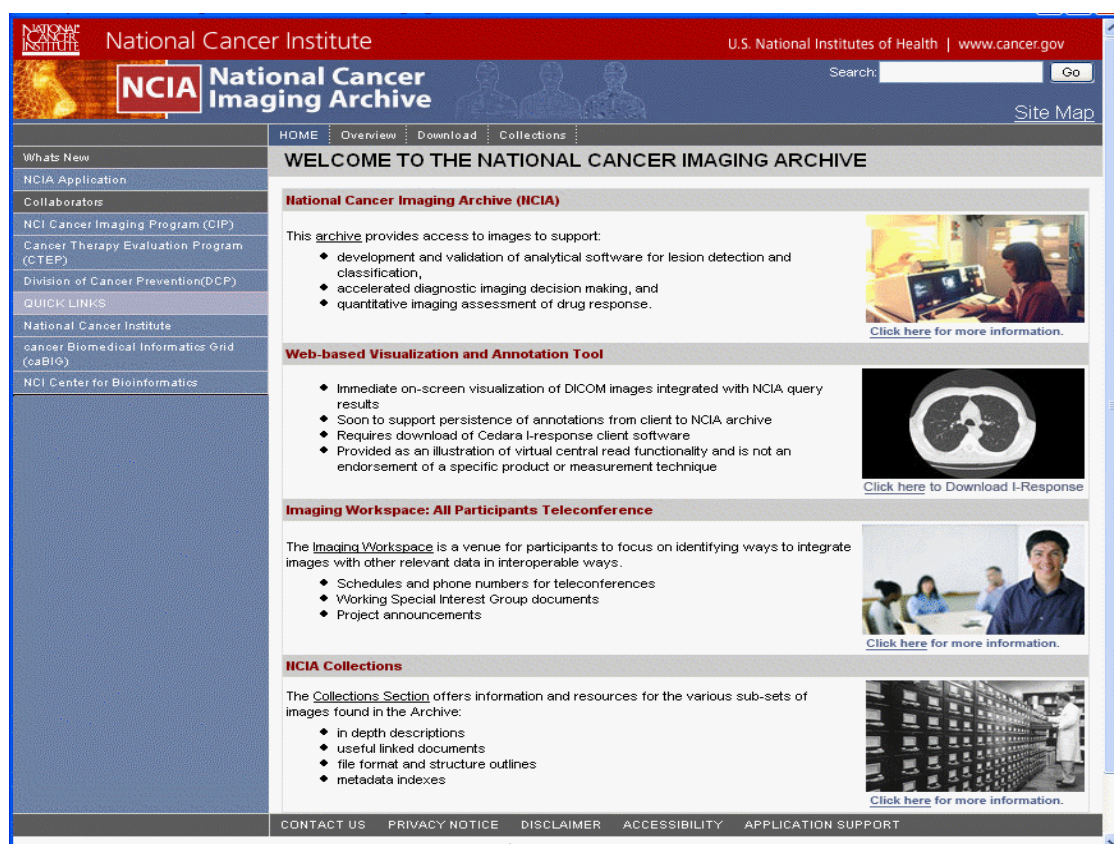


Figure 1.5 NBIA news page

The NCIA Portal page (*Figure 1.5*) consists of a center panel that displays current NBIA/NCIA-related information as well as sidebar and menu bar options that navigate to web sites and NBIA pages relevant to your tasks.

NCIA Portal Menu Bar

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

Option	Description
Home	Returns you to the NBIA News home page
Overview	Provides an overview of NBIA and its goals
Download	Displays NBIA software available for download
Collections	Describes existing and future collections.

Table 1.5 News page top menu bar descriptions

Portal Site Map

Click the **Site Map** link in the upperright hand corner of the NCIA Portal page to display a list of site map information provided in the center panel (see *Figure 1.6*).

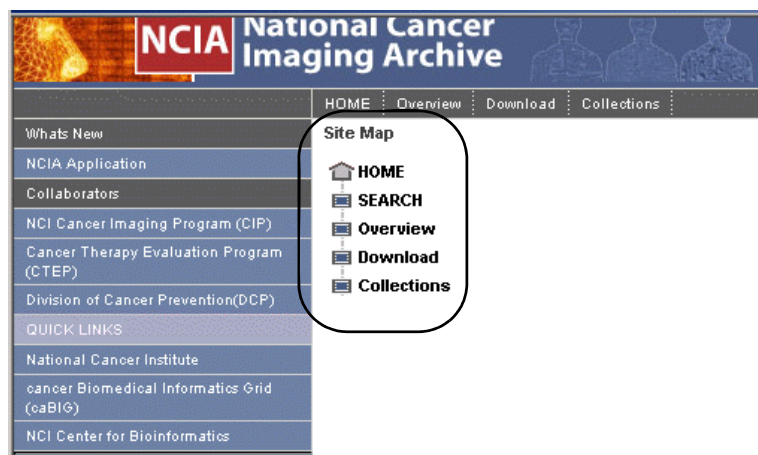


Figure 1.6 News page Site Map

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 the latest release of NBIA and its related files. For more information, refer to <https://imaging.nci.nih.gov>.

Portal Page Left SideBar

The left side bar of the Portal 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 10.

Option	Description
NBIA Application	Contains a link to the NBIA application

Table 1.6 News page left sidebar descriptions

<i>Option</i>	<i>Description</i>
Collaborators > NCI Cancer Imaging Program (CIP)	Displays the CIP web site in a separate browser window
Collaborators > Cancer Therapy Evaluation Program (CTEP)	Displays the CTEP web site in a separate browser window
Collaborators > Division of Cancer Prevention (DCP)	Displays the DCP web site in a separate browser window
Quick Links > National Cancer Institute	Link to NCI
Quick Links > Cancer Biomedical Informatics Grid (caBIG®)	Link to caBIG®
Quick Links > NCI Center for Bioinformatics	Link to NCICB

Table 1.6 News page left sidebar descriptions (Continued)

Accessing NBIA from Another Application

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

When NBIA is launched by a search defined and initiated from another application, the system runs the query, then opens to the NBIA 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 NBIA, if the search is successful, NBIA 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 NBIA. For I-SPY, see the download page on the NCICB web site: <http://ncicb.nci.nih.gov/download/>.

From this Search Results page that opens in NBIA, 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: <ul style="list-style-type: none"> 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.


Using NBIA Online Help

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

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

- Click the **Help** menu option on the top menu bar to open the complete online help project.
- Note:** You can access online help without being logged into NBIA.
- Click the **Help** icon or button at the top of each page to open a context sensitive topic.

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.

Note:

Only the person who submitted the model. Permission is granted to other people to submit the model. For more information, see the help topic.

Related Topics

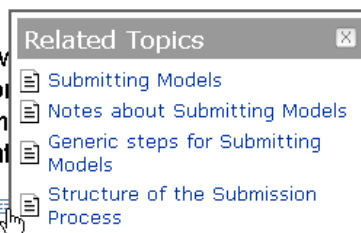


Figure 1.7 Related Topics button and associated list

- Locate topics using the table of contents that displays in the left panel of the online help project or the Index tab that displays at the top of the Table of Contents panel.

Perform word searches of Help by entering query text in the search text box.

CHAPTER 2

SEARCHING FOR IMAGES

This chapter describes how to use NBIA.

Topics in this chapter include:

- *Performing Searches* on this page
- *Searching Curation Data* on page 21
- *Specifying Remote Search Sites* on page 29
- *Working with Saved Search Queries* on page 30
- *Viewing Search Results* on page 34
- *Working with the Data Basket* on page 41
- *Obtaining DICOM Viewers* on page 44
- *Initiating Searches from Other Applications* on page 44

Performing Searches

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

The NBIA *in vivo* image repository is designed as an archive which you can use 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 NBIA submissions are organized in the following hierarchy, which is important to remember in creating your search query and reviewing search results:

Collection > Patient (Subject) > Study > Series > Images

NBIA 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.

3. **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.

Note: The data shown in the search results come from the supplied source, not from what NBIA derives unless explicitly stated.

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 NBIA imaging archive ([Figure 2.1](#)). (See [Specifying Remote Search Sites](#) on page 29.

Simple Search ?

*All searches are conducted at the series level

*Different types of criteria are ANDed together when searching. Different values for the same criteria are ORed together.
For example, if two modalities and two collections are selected, results will be returned that match at least one of the selected modalities and at least one of the selected collections.

*Default equals "All"

Figure 2.1 Simple Search page (top)

The remainder of the Simple Search page displays the search criteria ([Figure 2.2](#)).

SEARCH CRITERIA	
Image Modality(ies)	<div> <div>Available</div> <div> CR CT DX HC HISTOPATHOLOGY MR PT </div> <div> SELECT > SELECT ALL >> << REMOVE ALL < REMOVE </div> <div>Selected*</div> </div> <p>*Return cases that include <input type="radio"/> ALL <input checked="" type="radio"/> ANY of the selected modalities.</p>
Contrast	<input checked="" type="checkbox"/> Enhanced <input checked="" type="checkbox"/> Unenhanced
Anatomical Site	<div> <div>Available</div> <div> ABDOMEN BRAIN BREAST CHEST HAND HEAD KNEE </div> <div> SELECT > SELECT ALL >> << REMOVE ALL < REMOVE </div> <div>Selected</div> </div>
Image Slice Thickness	<input type="checkbox"/> I would like to filter by "Image Slice Thickness" <div> <div>></div> <div>0 mm</div> <div>AND</div> <div><=</div> <div>5 mm</div> </div>
Collection(s) Collection Descriptions	<div> <div>Available</div> <div> CT Colonography LIDC NCRI Phantom Phantom-FDA RIDER </div> <div> SELECT > SELECT ALL >> << REMOVE ALL < REMOVE </div> <div>Selected</div> </div>
Available on NBIA (mm/dd/yyyy)	From: <input type="text"/> To: <input type="text"/>
Series Includes Annotations	<input checked="" type="checkbox"/> Annotated <input checked="" type="checkbox"/> Non-Annotated

Figure 2.2 A segment of Simple Search criteria

2. Choose the search criteria described in [Table 2.1](#).

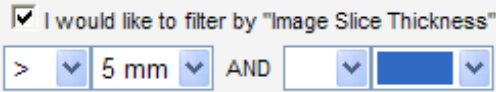
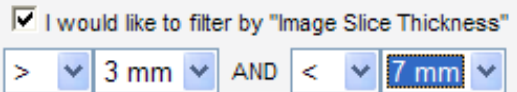
Simple Search Criteria	Description
Image Modality(ies)	<p>Select from the available image classifications and move them to the Selected panel. If none are selected, then the search returns data for all modalities.</p> <p>Regarding the text options:</p> <ul style="list-style-type: none"> • Select ALL to return only cases where all selections apply. • Select ANY to return cases to which one or more of the selections apply.
Contrast	<p>Select either option:</p> <ul style="list-style-type: none"> • Enhanced • Un-enhanced <p>If you leave both options unchecked, or if you select both options, the results will be the same--as though you had selected both options.</p>
Anatomical Site	<p>Select from the available anatomical sites. If none are selected, then the search returns data for all anatomical sites.</p> <p>Note: The value NOT SPECIFIED means that the field has no value, is empty or is not given a value as supplied by the source. If you select NOT SPECIFIED, then all images are found where anatomical sites are not specified.</p>
Image Slice Thickness	<p>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:</p>  <p>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:</p>  <p>If you do not select this, then the search returns data for all image slice thicknesses.</p>

Table 2.1 Simple Search criteria

Simple Search Criteria	Description
Collection(s)	Collections are NCI-defined groupings of image data sets. Select from the collections to which you have been assigned accessibility. If none are selected, then the search returns data for all collections. Click Collection Descriptions for more information about the collections.
Available on NBIA (mm/dd/yyyy)	Using the date convention, enter a date range for images to be searched. All images submitted within that range and for which you have viewer privileges will be listed as part of the search results.
Series Includes Annotations	Select either option: <ul style="list-style-type: none"> • Annotated • Non-Annotated If you leave both options unchecked, or if you select both options, then the search returns both series that have annotations and do not have annotations.
Results per Page	Select the number of search results per page the search will return. Note: This number also defines the number of thumbnail images that will display in the Search Results (Images for Series) on page 38.
Subject IDs	Enter one or more subject ID strings, separated by commas.

Table 2.1 Simple Search criteria (Continued)

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 34).
 - 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, 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 34.

Searching Curation Data

NBIA 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 Includes Annotations** field on the search page.)

To make the data in NBIA 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 NBIA by someone with Curate permissions (in the UPT) using the Upload Curation Spreadsheet feature. For more information, see [Uploading and Parsing the Curation Spreadsheet](#) on page 61. 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 ([Figure 2.3](#)).

Annotation Keyword Search ?

This page allows you to search for series based on annotation keywords and their values.

First, choose the search terms on which you would like to search. Then, press the "Display Keywords" button to view the keywords available for each search term.

[← BACK TO SIMPLE SEARCH](#)

PREVIOUSLY SELECTED SIMPLE SEARCH CRITERIA	
Collection(s)	LIDC, RIDER, Virtual Colonoscopy

SEARCH TERMS

Available

Age
 CT_Number_of_Polyps_Found
 CT_of_DiagnosticQuality
 QA Testing
 QA Testing
 QA Testing
 QA Testing

SELECT V
SELECT ALL V
REMOVE ALL
REMOVE

Selected

CT_Polyps_Found
 Image description 07

[DISPLAY KEYWORDS](#)

Figure 2.3 Annotation Keyword Search page

Note: If before you started your search, you specified a remote site to be searched (*Specifying Remote Search Sites* on page 29), when you open the page, the Remote Sites Selected table lists the sites to be searched outside the local NBIA 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 2.4*).

The screenshot shows two main panels. The top panel, titled "SEARCH TERMS", has a "Search Terms" box on the left and a right section with "Available" and "Selected" lists. The "Available" list contains "Histologic Changes", "Nodule Volume", "Image description 2", and "Image description 2". The "Selected" list contains "Lung Lobe of Nodul". Between these lists are buttons: "SELECT >", "SELECT ALL >>", "<< REMOVE ALL", and "< REMOVE". Below the "Selected" list is a "DISPLAY KEYWORDS" button. Below this panel is the text "Choose the keywords for which you want results returned."

The bottom panel shows the "Keywords" section. It has a "Search Term" box containing "Lung Lobe of Nodule" and a "Keywords" box. The "Keywords" box is divided into "Available" and "Selected" lists. The "Available" list contains "LUNG LUL", "LUNG RML", "LUNG RUL", and "Lingula". The "Selected" list contains "LUNG LLL" and "LUNG RLL". Between these lists are buttons: "SELECT >", "SELECT ALL >>", "<< REMOVE ALL", and "< REMOVE". Below the "Keywords" box are "SUBMIT" and "RESET" buttons.

Figure 2.4 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 2.4*).

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 34.

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 NBIA 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 NBIA imaging archive ([Figure 2.1](#)). (See [Specifying Remote Search Sites](#) on page 29.)

Advanced Search

*All searches are conducted at the series level

*Different types of criteria are ANDed together when searching. Different values for the same criteria are ORed together. For example, if two modalities and two collections are selected, results will be returned that match at least one of the selected modalities and at least one of the selected collections.

*Default equals "All"



SIMPLE SEARCH

REMOTE SITE(S) SELECTED
New Dev

Figure 2.5 Advanced Search Page

The remainder of the Advanced Search page displays the search criteria (Figure 2.6).

SEARCH CRITERIA	
Image Modality(ies)	<div> <div>Available</div> <div> CR CT DX HC HISTOPATHOLOGY MR PT </div> <div> SELECT > SELECT ALL >> << REMOVE ALL < REMOVE </div> <div>Selected*</div> </div> <p>*Return cases that include <input type="radio"/> ALL <input checked="" type="radio"/> ANY of the selected modalities.</p>
Contrast	<input checked="" type="checkbox"/> Enhanced <input checked="" type="checkbox"/> Unenhanced
Anatomical Site	<div> <div>Available</div> <div> ABDOMEN BRAIN BREAST CHEST HAND HEAD KNEE </div> <div> SELECT > SELECT ALL >> << REMOVE ALL < REMOVE </div> <div>Selected</div> </div>
Image Slice Thickness	<input type="checkbox"/> I would like to filter by "Image Slice Thickness" > 0 mm AND <= 5 mm
Minimum Number of Previous Studies	Baseline Plus <input type="text" value="1"/>
Number of Months between Baseline and Final Study	<input type="text" value="1"/>
Collection(s) Collection Descriptions	<div> <div>Available</div> <div> CT Colonography Jim5 LIDC NCRI Phantom Phantom-FDA </div> <div> SELECT > SELECT ALL >> << REMOVE ALL < REMOVE </div> <div>Selected</div> </div>
Available on NIBIA (mm/dd/yyyy)	From: <input type="text"/> To: <input type="text"/>
Series Includes Annotations	<input checked="" type="checkbox"/> Annotated <input checked="" type="checkbox"/> Non-Annotated
Subject ID(s)	<input type="text"/>

Figure 2.6 Advanced Search page

- Choose the search criteria as described in Table 2.2.

Advanced Search Criteria	Description
Image Modality(ies)	<p>Select from the available image classifications and move them to the Selected panel. If none are selected, then the search returns data for all modalities.</p> <p>Regarding the text options:</p> <ul style="list-style-type: none"> Select ALL to return only cases where all selections apply. Select ANY to return cases to which one or more of the selections apply.

Table 2.2 Advanced Search Criteria

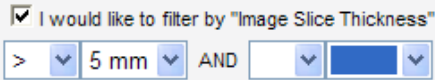
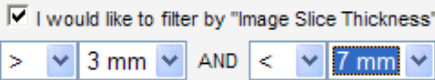
Advanced Search Criteria	Description
Contrast	<p>Select either option:</p> <ul style="list-style-type: none"> • Enhanced • Un-enhanced <p>If you leave both options unchecked, or if you select both options, the results will be the same--as though you had selected both options.</p>
Anatomical Site	<p>Select from the available anatomical sites. If none are selected, then the search returns data for all anatomical sites.</p> <p>Note: The value NOT SPECIFIED means that the field has no value, is empty or is not given a value as supplied by the source. If you select NOT SPECIFIED, then all images are found where anatomical sites are not specified.</p>
Image Slice Thickness	<p>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:</p>  <p>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:</p>  <p>If you do not select this, then the search returns data for all image slice thicknesses.</p>
Previous Minimum Number of Studies	<p>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.</p>
Number of Months between Baseline and Final Study	<p>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.</p>
Collection(s)	<p>Collections are groupings of image data sets defined by a system administrator. 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.</p>

Table 2.2 Advanced Search Criteria (Continued)

Advanced Search Criteria	Description
Available on NBIA (mm/dd/yyyy)	Using the date convention, enter a date range for images to be searched. All images submitted within that range and for which you have viewer privileges will be listed as part of the search results.
Series Includes Annotations	Select either option: <ul style="list-style-type: none"> • Annotated • Non-Annotated If you leave both options unchecked, or if you select both options, then the search returns both series that have annotations and do not have annotations.
Subject IDs	Enter one or more subject ID strings, separated by commas.
The following criterion displays below the DICOM criteria on the search page:	
Results per Page	Select the number of search results per page the search will return. Note: This number also defines the number of thumbnail images that will display in the Search Results (Images for Series) on page 38.

Table 2.2 Advanced Search Criteria (Continued)

3. Choose the modality manufacturer search criteria as shown in [Figure 2.7](#) and described in [Table 2.3](#).

Modality Manufacturer	
Manufacturer	<input type="checkbox"/> All Manufacturers
Model(s)	<input type="checkbox"/> GE MEDICAL SYSTEMS (13)
Software Version	<input type="checkbox"/> SIEMENS[dev] (6)
	<input type="checkbox"/> TOSHIBA (1)
	<input type="checkbox"/> DeJarnette Research Systems (1)
	<input checked="" type="checkbox"/> Philips Medical Systems (1)
	<input type="checkbox"/> VARIAN Medical Systems (1)

Figure 2.7 Modality Manufacturer Search Criteria

Criteria	Description
Manufacturer Model Software Version	<p>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.</p> <ul style="list-style-type: none"> 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. <p>If none are selected, then the search returns data for all manufacturers.</p>

Table 2.3 Modality Manufacturer Search Criteria

4. Choose the DICOM search criteria as shown in [Figure 2.8](#) and described in [Table 2.4](#). For more information on DICOM, see <http://medical.nema.org/>.


DICOM			
0008	103E	Series Description	<input type="text"/>
0018	1210	Convolution Kernel	<input type="text" value="v"/>
0018	0060	Kilovoltage Peak Distribution	<input type="text" value="v"/> AND <input type="text" value="v"/> 

Figure 2.8 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. The specified text must exactly match a portion of an existing series description (not case-sensitive).
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.

Table 2.4 DICOM search criteria

Criteria	Description
Kilovoltage Peak Distribution	<p>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.</p> <p>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 (=>).</p> <p>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 (=<) from the second drop-down list and specify the maximum peak distribution.</p>

Table 2.4 DICOM search criteria (Continued)

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 34).
 - 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 21.
 - 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.

Specifying Remote Search Sites

A remote search site is an image database residing outside of the local NBIA imaging archive. When you select a remote image database, Simple, Advanced, and Annotation Keyword Search pages display search results for the local NBIA 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 NBIA 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 2.9](#)).

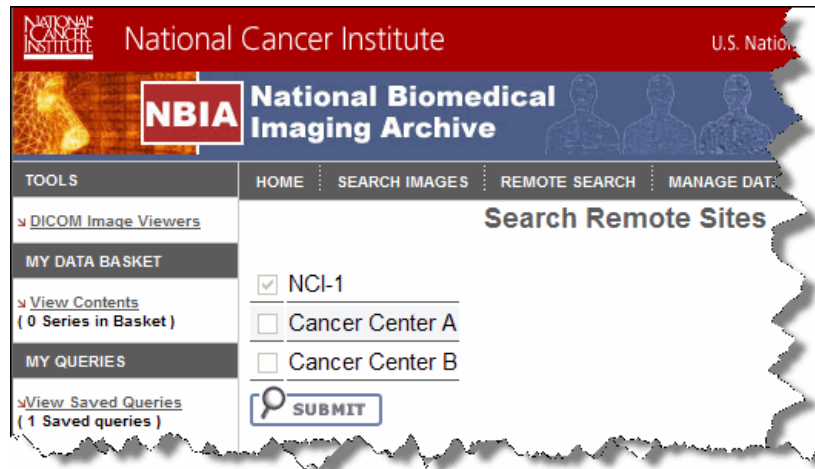


Figure 2.9 You can interact with remote sites by selecting the Search Remote Sites feature on the Search page.

“Local” represents the NBIA 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](#).

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](#)).

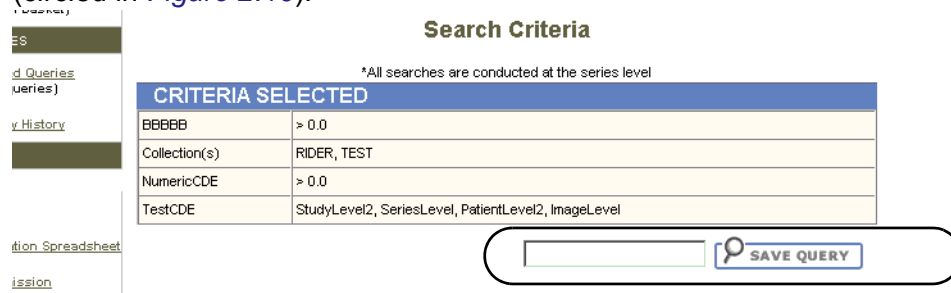


Figure 2.10 Save Query option

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.

NBIA 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*).

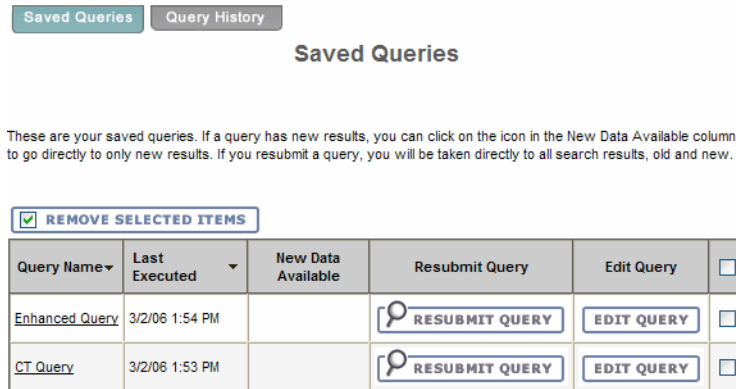


Figure 2.11 Saved Queries page

This page displays a table of all queries that are currently saved for you. Table columns are described in *Table 2.5*. 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.
Check Box	Click the check box to mark the query for deletion. You can click the check box in the header to select all queries or you can select queries individually.

Table 2.5 Saved Query descriptions and tasks

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 NBIA 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 33).
- **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 executed 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 31) 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.

Search Criteria

*All searches are conducted at the series level

CRITERIA SELECTED	
Collection(s)	RIDER
Contrast	Enhanced

Save Query:

☒ Update saved query "Enhanced Query" with the new criteria
☐ Save this criteria as a new saved query called:


 **SAVE QUERY**

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.

Saved Queries
Query History

Query History

These are the last twenty queries that have been submitted. A query can be resubmitted by clicking the 'Resubmit Query' button.

Query Name	Last Executed	Resubmit Query
CT Query	3/6/06 5:53 PM	RESUBMIT QUERY
No Name Provided	3/6/06 5:53 PM	RESUBMIT QUERY
CT Query	3/6/06 5:52 PM	RESUBMIT QUERY
RIDER Query	3/6/06 5:51 PM	RESUBMIT QUERY
No Name Provided	3/6/06 5:51 PM	RESUBMIT QUERY

Figure 2.13 Query History page

The Query History table contains the data in [Table 2.6](#)

Field Name	Description
Query Name	<p>The name of the query displays as a link. The link toggles whether the criteria for the executed query is displayed. The text of the link can appear three different ways depending on the situation</p> <ul style="list-style-type: none"> • 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 34).

Table 2.6 Query History

Click the **Saved Queries** tab to display the Saved Queries page (see [Managing Saved Queries](#) on page 31).

Viewing Search Results

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

Collection > Patient (Subject) > Study > Series > Images

Search results display first as [Search Results \(by Subject\)](#). As you click on **Show Studies** links in those results, NBIA 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, or a series—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 has 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.

Search Results (by Subject)



Subjects checked ☒ can be added to your basket.

☒ CHECK ALL ☐ UNCHECK ALL  ADD TO BASKET

	Collection ID ▾	Subject ID ▾	Studies ▾	Series ▾	 Location ▾
Show Studies	CT Colonography	13614193285040001	1 / 1	4 / 4	<input type="checkbox"/> NCI-1
Show Studies	CT Colonography	13614193285040002	1 / 1	3 / 3	<input type="checkbox"/> NCI-1
Show Studies	CT Colonography	13614193285040003	1 / 1	2 / 2	<input type="checkbox"/> NCI-1

| 1 - 3 of 3 |


 VIEW MY BASKET

Figure 2.14 Search Results by Subject

Table 2.7 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.
Collection ID	Collection identifier
Subject ID	Subject identifier
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
[Basket] Check Box	Click the check box to mark the result for addition to your data basket. Click the check box in the header to select all results, or you can select results individually.
Location	<p>The location of the image</p> <p>“Local” represents the NBIA 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 29.</p>

Table 2.7 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 36.
- Some search results may display, but results from a disallowed collection are not included.

When you save a query 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 41).
 - Click **View My Basket** to display the items in your data basket (see [Managing the Data Basket](#) on page 41).

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, showing Study level in the bread crumbs at the page bottom. 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](#)).

Search Results (Studies for Subject 13614193285040001) ?

☒ CHECK ALL
 ☐ UNCHECK ALL

To VISUALIZE IMAGES, a 3rd party software is required.
Click [here](#) to download Cedara I-Response software.

[VIEW MY BASKET](#)
[ADD TO BASKET](#)
[VISUALIZE IMAGES](#)

Study ID						Date	
1.3.6.1.4.1.9328.50.4.1						Jan 1, 2000	
Description						Data Location	
Abdomen*24ACRIN_Colo_IRB2415-04 (Adult)						NCI-1	
	Series	Images	Description	Modality	Manufacturer	Contains Annotations	
Show Images	1.3.6.1.4.1.9328.50.4.1222	2	Topo supine 0.6 T20s	CT	SIEMENS	No	<input type="checkbox"/>
Show Images	1.3.6.1.4.1.9328.50.4.1224	1	Topo prone 0.6 T20s	CT	SIEMENS	No	<input type="checkbox"/>
Show Images	1.3.6.1.4.1.9328.50.4.563	625	Colo_supine 1.0 B30f	CT	SIEMENS	No	<input type="checkbox"/>
Show Images	1.3.6.1.4.1.9328.50.4.2	604	Colo_prone 1.0 B30f	CT	SIEMENS	No	<input type="checkbox"/>

[VIEW MY BASKET](#)
[ADD TO BASKET](#)
[VISUALIZE IMAGES](#)

SEARCH >> SUBJECT >> **STUDY**

Figure 2.15 Studies for Subject Search Results

[Table 2.8](#) describes each item in the Search Results (for subject) table.

Search Result	Description
Show Images	Click this link to display the images for the series.
Series	Series ID

Table 2.8 Studies for Subject Search ResultsSearch Results for Studies for Subject

Search Result	Description
Images	<p>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.</p> <p>Note: If you select a series with more than two images, you can view an animation of the image collection. For more information, see Search Results (Images for Series) on page 38 and Viewing Image Animation on page 39.</p>
Description	Description of the Series
Modality	Modality
Manufacturer	Name of the manufacturer
Contains Annotations	<p>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.</p>
Check Box	Click the check box to mark the result for addition to your basket. You can click the check box in the header to select all results or you can select results individually.

Table 2.8 Studies for Subject Search ResultsSearch Results for Studies for Subject

- 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, click this link to the NCICB GForge Download page: https://gforge.nci.nih.gov/frs/?group_id=312. Toward the top of the page, click the **I-ResponseR.v.[x.zip]** hypertext link. You can download the corresponding user’s guide, accessible from the same site, as well.
1. Start the Cedara IRW on your system.

Note: If the IRW is not executed, you cannot visualize images. NBIA will inform you to install/execute the Cedara first.
 2. 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.

Note: If you are not logged in, when you click this button, NBIA informs you that you must log in to access this feature.
 3. 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 check boxes individually.
 - Click the **Add to Basket** button to add items selected to your data basket (see [Adding Items to Your Basket](#) on page 41).

- ° Click **View My Basket** to display the items in your data basket (see [Managing the Data Basket](#) on page 41).

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. The bread crumbs at the top and bottom of the page show that you are viewing image thumbnails at the series level.

A table at the top of the page ([Figure 2.16](#)) contains information defined for the series, followed by an option to launch an animation of the images (where there are more than two). Thumbnail images for the series you selected are also display on the page. The number of images that displays corresponds to the results per page that you defined when you set the search criteria. .

SEARCH » SUBJECT » STUDY » **SERIES**

DICOM Series Number 1.3.6.1.4.1.9328.50.1.345

Images on this page are meant to aid selection only. The downloaded DICOM files will be provided at their original resolution.

Subject ID	Study Instance UID	Date	Modality	Manufacturer	Contains Annotations	Data Location	DICOM
1.3.6.1.4.1.9328.50.1.0001	1.3.6.1.4.1.9328.50.1.275	Jun 20, 2000	CT	GE MEDICAL SYSTEMS	No	NCI-1	

[View series in Cine mode...](#)

ADD TO BASKET

VIEW MY BASKET

DICOM Series Number 3 Recon 2:

1

2

3

4

5

6

7

8

9

10

| 1 - 10 of 55 | [Next](#) >>

SEARCH » SUBJECT » STUDY » **SERIES**

Figure 2.16 Images for Series Search Results

Table 2.9 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.
Data Location	Displays the name of the center housing the data
DICOM	Click the DICOM icon to open a new window that displays DICOM metadata about the first image in the series. Each image series can have multiple images whose thumbnails display in this search results page. While each image has its own DICOM file whose attributes may vary slightly from the others in the series, the DICOM file that opens displays values for only the first image in the series. These values represent the values for all images in the series.


Table 2.9 Images for Series Search Result fields

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

- Launch an animation of the series (where there are more than two thumbnails). Under the table summarizing the series information, click **View Movie** at the end of the sentence, “To view an animation of the images in this series, ...”. For more information, see [Viewing Image Animation](#).
 - To enlarge an image, float your cursor over an image thumbnail (or click it). A larger version of the image displays in the upper right hand corner of the page.
 - Click the **Add to Basket** button to add the entire series to your data basket (see [Adding Items to Your Basket](#) on page 41). Images that you add become highlighted on the Images for Series page.
- Note:** You cannot add images individually to the data basket.
- Click **View My Basket** to display the items in your data basket (see [Managing the Data Basket](#) on page 41).

Viewing Image Animation

From the [Search Results \(Images for Series\)](#) (DICOM Series) page, you can launch an animation of thumbnails where there are more than two images in the series. Click the **View Series in Cine Mode** link.

You can also launch the animation of an image series from the Data Basket. In the **View** column of the Data Basket, click the magnifying glass symbol,  corresponding to the series you want to view. On the View Series Images page, click the **View Series in Cine Mode** link.

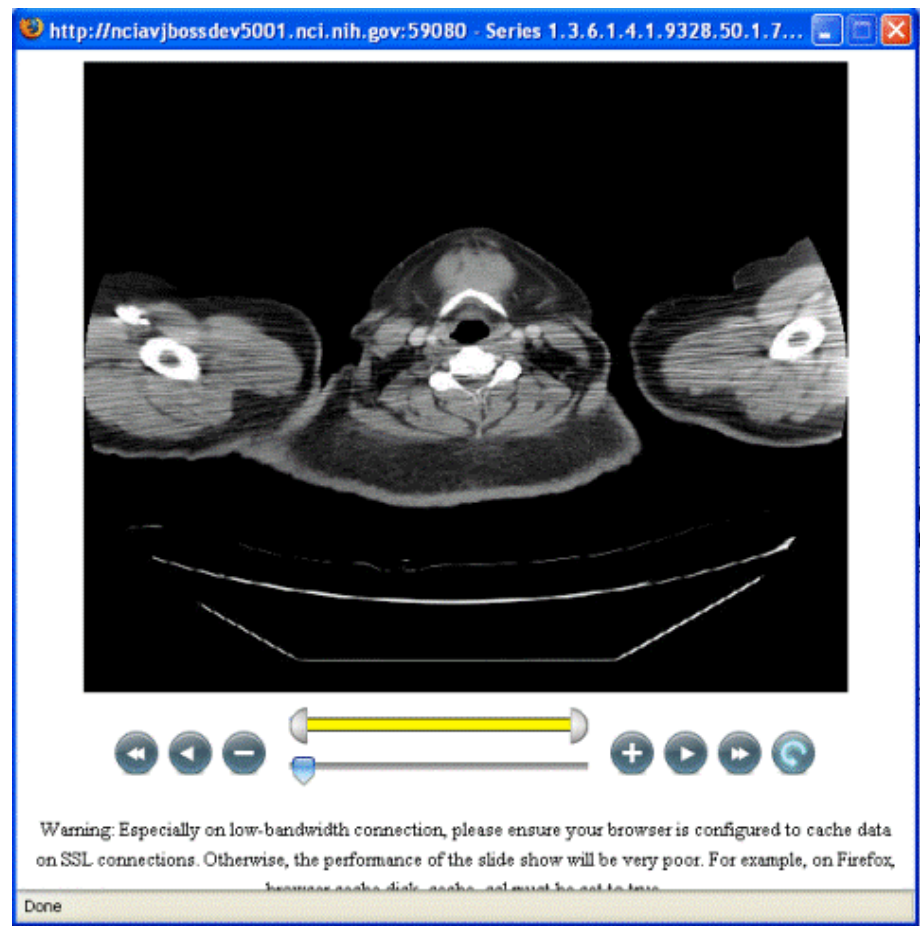



Figure 2.17 Image animation viewer

When the viewer opens, click the play forward button (). NBIA proceeds to display the images sequentially in a “movie”.

The following table describes the action of each of the animation controls.



	Drag the arrow to set which frame of the movie displays. This also monitors the progress of the animation.
	Drag ends of the yellow bar to vary the range of images playing.

Table 2.10 Image animation controls








a. 	b. 	a. Click to return to the first image in the series. b. Click to progress to the last image in the series.
a. 	b. 	a. Click to play animation backwards through the series b. Click to play animation forward through the series
a. 	b. 	a. Click to stop the animation; click successively to display one image at a time, moving backwards through the series. b. Click to stop the animation; click successively to display one image at a time, moving forward through the series.
c. 	Click to cycle the animation forward or backward. Once set, the animation continues <i>ad infinitum</i> .	

Table 2.10 Image animation controls

Note: If the animation is very sluggish, be sure and note the warning at the bottom of the page.

Working with the Data Basket

As you review search results in NBIA, 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, and series 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 check boxes for items individually.

Note: Check boxes do not exist on the Images for Series page. If you click the **Add to Basket** button on the page, all of the images in the series are added to the Data Basket.

2. When satisfied, click the **Add to Basket** button.

The items added to the basket are highlighted on the page from which you initiated this task.

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 2.18*).

[← BACK TO SEARCH RESULTS](#)

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](#) [VISUALIZE IMAGES](#) ☒ [REMOVE SELECTED ITEMS](#)

View	Subject ID	Study Instance UID	Series ID	Number of Images	Image Size (in MB)	Annotation File Size (in MB)	Select <input type="checkbox"/>	Location
	13614193285030391	1.3.6.1.4.1.9328.50.3.206908	1.3.6.1.4.1.9328.50.3.206907	116 / 116	61.0	0.049	<input type="checkbox"/>	NCI-1
	13614193285030488	1.3.6.1.4.1.9328.50.3.152846	1.3.6.1.4.1.9328.50.3.152847	536 / 536	281.9	N/A	<input type="checkbox"/>	NCI-1
	13614193285030490	1.3.6.1.4.1.9328.50.3.153915	1.3.6.1.4.1.9328.50.3.153916	429 / 429	225.6	N/A	<input type="checkbox"/>	NCI-1
	13614193285030642	1.3.6.1.4.1.9328.50.3.207036	1.3.6.1.4.1.9328.50.3.207037	558 / 558	293.5	N/A	<input type="checkbox"/>	NCI-1
	13614193285030646	1.3.6.1.4.1.9328.50.3.209108	1.3.6.1.4.1.9328.50.3.209109	441 / 441	231.9	N/A	<input type="checkbox"/>	NCI-1
	13614193285030647	1.3.6.1.4.1.9328.50.3.209551	1.3.6.1.4.1.9328.50.3.209552	483 / 483	254.0	N/A	<input type="checkbox"/>	NCI-1

Estimated download time T1(1.5 Mbps) for all files: 24 minute(s)

Figure 2.18 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 Instance UID	Study identification number
Series ID	Series identification number
Number of Images	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 N/A if there are no annotations.
Select	To remove the item from the basket, select the check box and click the Remove Selected Items button.
Location	The location of the image “Local” represents the NBIA 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 29.

Table 2.11 My Data Basket field

The total size of your data basket and the estimated download time displays at the bottom of the My Data Basket page (*Figure 2.18*).

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.

Tip: 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.

Note: If you are not logged in, you have a download limit of up to 3 GB of data. NBIA warns you and stops you when you add data that will exceed the limit. You cannot download the data until you remove something from the basket. Alternatively, you can login, after which the data basket limit is relaxed.

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

If the size is above the HTTP download threshold, NBIA will zip the file and display a message 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](http://curlftp://imaging.nci.nih.gov)) included with Macintosh machines built on *nix.

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 NBIA 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://www.osirix-viewer.com/>
- ClearCanvas Workstation: <http://www.clearcanvas.ca/dnn/Creations/PACSWorkstation/tabid/64/Default.aspx>

Initiating Searches from Other Applications

Searches in NBIA can be launched from other applications. For more information, see *Accessing NBIA from Another Application* on page 13.

CHAPTER 3

SUBMITTING IMAGES

This chapter describes how to submit images to NBIA.

Topics in this chapter include:

- [Image Submission Overview](#) on this page
- [Configuring Security for Newly Submitted Data](#) on page 51
- [Alternative Image Configuration/Submission Methods](#) on page 56

Image Submission Overview

When you submit an image to NBIA using FileSender, the process follows this path:



In summary, the process involves the following steps:

1. Installing the CTP (Clinical Trial Processor) client and FileSender.
2. Unzip the file and open both tools on your local machine.
3. In FileSender, locate the image(s) to be submitted.
4. Update the anonymization script.
5. FileSender sends the image(s) to the RSNA Clinical Trial Processor (CTP) client, which anonymizes the data to comply with patient privacy policies.
6. The CTP client forwards the image(s) over the internet to the CTP server.
7. The CTP server transfers the image(s) to your NBIA database repository.

See also [Alternative Image Configuration/Submission Methods](#) on page 56.

Configuring the CTP Client

To submit images, you must have the CTP client and FileSender both installed and running on your machine. For more information, refer to the NBIA Installation Guide, available here: http://gforge.nci.nih.gov/frs/?group_id=312. For information regarding your specific installation issues, contact NCICB Application Support ncicb@pop.nci.nih.gov.

1. To start your local CTP client, execute the `ctp.bat` (`ctp.sh` in Linux) in the CTP-Client/CTP folder.
2. Open a browser and type in the URL for your local installation. You can find the port number by looking in the `config.xml` file in the CTP folder. The third line of the standard file is "<Server port='24080' />". If changes are made to this number, the localhost port needed to access the CTP admin page will change in tandem.

Note: You may want to refer to the helpful information about this part of the CTP setup on the NCI wiki at this URL: <https://wiki.nci.nih.gov/display/Imaging/CTP+Pipeline+Templates+for+NBIA>

The CTP Client Console opens in your browser..

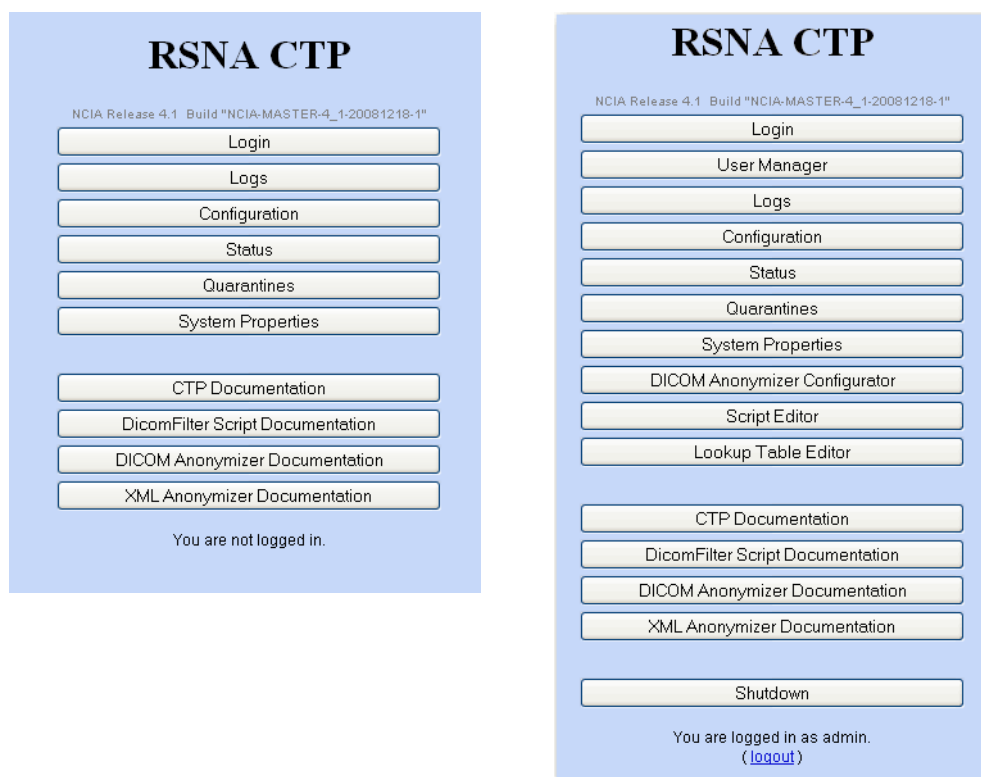


Figure 3.1 CTP client main menu, when you are not logged in (left), and when you are logged in (right)

Note: You do not need to be logged in to the CTP client to review some of the pages. See [Figure 3.1](#). You do need to be logged in to configure the anonymizer.

3. Click the **Configuration** button. This opens the Configuration page, described below. For more information on using the Anonymizer Configurator, see <https://wiki.nci.nih.gov/x/LQTx>.
4. On the Configuration page, verify the URL in the bottom section of the page, HTTP Export. This should point to the import service of the CTP server to which the images will be exported from the CTP client. You cannot change the text on this page; it must be changed in the `config.xml` file referred to in step 2.
5. Once file(s) are received in the CTP client, they are anonymized there. To configure the anonymization parameters, you must be logged in. Get the login credentials from your administrator.
6. Click the **DICOM Anonymizer Configurator** button on the CTP client main page. (This option appears only after you are logged in.)
7. Click the hypertext link in the first screen that opens. This takes you to the page where you can enter, verify or edit anonymization parameters ([Figure 3.2](#)). The default configuration is from the `da.script` file.

Select	Element	Script
	DATEINC	0
	PROFILENAME	DICOM-S142-Baseline
	PROJECTNAME	Test
	SHORTNAME	Test
	SITEID	1
	SITENAME	Test
	TRIALNAME	Test
	UIDROOT	9999
<input checked="" type="checkbox"/>	[0008,0005] SpecificCharacterSet	@keep()
<input checked="" type="checkbox"/>	[0008,0012] InstanceCreationDate	@incrementdate(this,@DATEINC)
<input checked="" type="checkbox"/>	[0008,0014] InstanceCreatorUID	@hashuid(@UIDROOT,this)
<input checked="" type="checkbox"/>	[0008,0016] SOPClassUID	@keep()
<input checked="" type="checkbox"/>	[0008,0018] SOPInstanceUID	@hashuid(@UIDROOT,this)
<input checked="" type="checkbox"/>	[0008,0020] StudyDate	@incrementdate(this,@DATEINC)
<input checked="" type="checkbox"/>	[0008,0021] SeriesDate	@remove()
<input checked="" type="checkbox"/>	[0008,0022] AcquisitionDate	@remove()
<input checked="" type="checkbox"/>	[0008,0023] ContentDate	@incrementdate(this,@DATEINC)

Figure 3.2 DICOM Anonymizer Configurator page from the CTP client.

Note: This page indicates how the image's DICOM tags are modified to anonymize the data, thus meeting HIPAA regulations to preserve

patients' privacy. For example, the patient's birthdate and patient ID are anonymized.

The following fields on this page are required:

- **PROJECT NAME**--This must correspond to whatever you are going to call the collection. The name might indicate the type of data, the research center that provided the data, or the collection type such as CT colonography for CT images of colonography.
- **TRIAL NAME** – This must be the same as the project name.
- **SITE NAME** – This identifies where data is coming from. Example = BioU. Several different collections could be submitted from there, but all would have same site name. The NBIA user does not see the source site for the data, except when using the Verify Submission feature, described in [Verifying Submitted Files](#) on page 61.

Note: Authorization controls pay attention to the site. So a user, based on permissions, for example, may be able to search on collection X/site A, but not collection X/site B.

- **SITE ID** – This is a predetermined, unique ID that always maps to the specific site. This is always constant for a given site and must be used when you submit images to your image repository. Example: BioU = 17. The four values above are required; without them the submission will fail.

The following field can also be configured.

- **UID ROOT** – This ID, assigned by an NBIA administrator, remains unique for every submitted collection from a particular research center. The anonymizer uses the identifier, typically a prefix for series instance UIDs, to determine the values for DICOM tags.

If you are submitting only to your local isolated system, you, as an administrator, can determine the UID root yourself. If, at some point, you foresee using caGrid[®], you should use valid, globally registered UID root numbers. Information on how to register can be found here: <http://www.dclunie.com/medical-image-faq/html/part8.html#UIDRegistration>

If a true globally unique ID Root is obtained, the UID Root will need to be appended by an UID Root End for each collection/site combination that will be submitted to that node of NBIA. This will keep the UIDs truly unique. For example:

UID Root = 555

Collection A, Site 1 UID Root End = .1

Collection A, Site 2 UID Root End = .2

Collection B, Site 1 UID Root End = .3

Collection B, Site 2 UID Root End = .4

Collection A, Site 1 UID Root = 555.1

Collection A, Site 2 UID Root = 555.2

Collection B, Site 1 UID Root = 555.3

Collection B, Site 2 UID Root = 555.4

Other fields can also be configured. The configuration and operation of the Anonymizer Configurator is described at this location: <https://wiki.nci.nih.gov/x/qQLj>.

Note: The current CTP client contains a WG 18 S142 compliant anonymization baseline. For more information about the Working Group 18, Supplement 142 profile, see <https://wiki.nci.nih.gov/x/xIL-/>.

Once the CTP client has been configured, you can begin the submission process in FileSender.

Submitting Images

1. To open the FileSender, execute the **filesender.bat** (**filesender.sh** in Linux) the CTP-Client/FileSender folder..

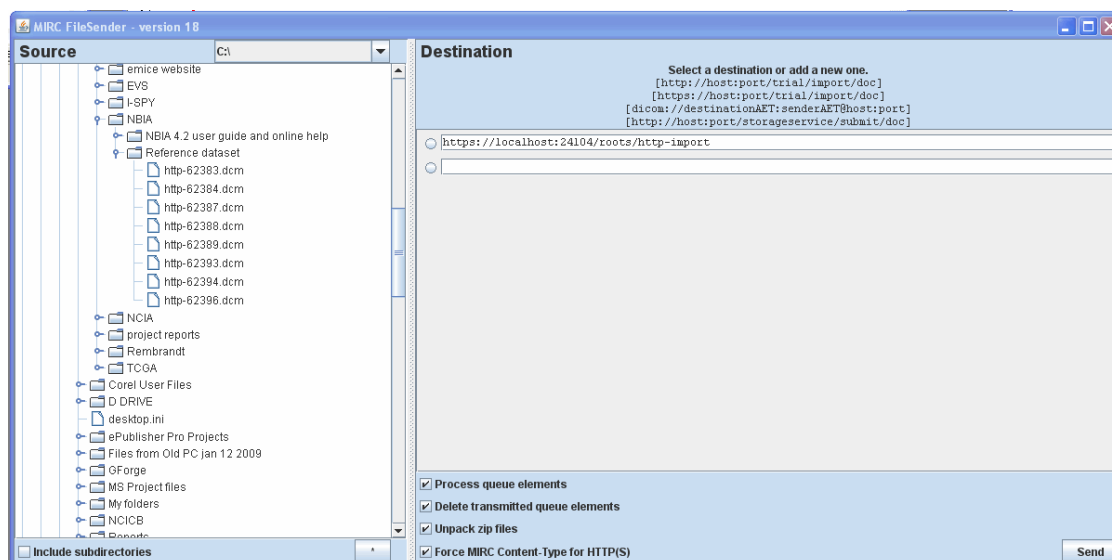


Figure 3.3 FileSender working panels

2. In the left panel of FileSender, select one image or a folder of images to be submitted (*Figure 3.3*). You cannot select and submit multiple individual images at one time.
 3. Select **Include Subdirectories** if you want subdirectories to your selection to also be submitted.
 4. Select the default URL for the destination in the Destination panel. This is the host and port number where the CTP client is located.
- Note:** The CTP client must be started to successfully submit images.
5. Leave the check boxes at the bottom of the Destination panel checked in the default selections.
 6. Click **Send** to execute the submission process to the CTP client. The Destination panel displays the progress of the task.

7. In the CTP client, click the **Status** button on the main page.

All of the fields supply information about the submission, but you might check especially the **Last File Received At** fields under each section. Correlate the date and time stamp when the submission was received with the time you sent the image(s). Refresh the page periodically to view the latest status.

8. If the Status tab does not indicate that the file(s) were received, verify the URL on the Destination tab of File Sender.

Troubleshooting Unsuccessful Image Submission

1. If you suspect your files have not been submitted successfully to the CTP client, click the **Quarantines** button in the CTP client main page to see if any files have been received there. If no files are quarantined, the quarantine indicators remain at zero.

Note: Each stage of processing in CTP can cause a quarantine, therefore the quarantine count is broken down by stage.

2. To see the list of quarantined files per stage, click the corresponding hyperlink for that stage.
 - If something is quarantined in the Import stage, the file is likely not a DICOM file.
 - If something is quarantined in the Anonymizer stage, there is likely an error in the anonymization script. Common problems with the anonymization script are:
 - Incorrect syntax (see the CTP section of the mircwiki for syntax: http://mircwiki.rsna.org/index.php?title=CTP-The_RSNA_Clinical_Trial_Processor)
 - referring to parameters that don't exist. For example if @PROJECTNAME is referred to in a rule, but not defined as a parameter.
3. If the quarantine feature indicates a file has been sent there, click the corresponding hypertext link. You will be able to view one row link to the DICOM header file of the quarantined file.
4. Click the **Log** button on the CTP client main page.
5. Click the hypertext link to the `CTP.log` or `All.log` to review the activity of the CTP client. This may help you determine the cause of an unsuccessful submission.
6. The same troubleshooting rules apply for CTP server, but the stages are different.
 - If a quarantine occurs in the storage service, a likely cause is that there is not enough disk space or the drive is not accessible by CTP.
 - If a quarantine occurs in the export service, there is likely something more subtle "wrong" with the DICOM file that NBIA doesn't like. For example, submitting an image that has the same series instance UID as a different, previously submitted image could cause a quarantine here. Looking in the log may reveal the issue.

To trouble-shoot server-side submission problems or for other submission issues, contact NCICB Application Support: <http://ncicb.nci.nih.gov/NCICB/support> or ncicb@pop.nci.nih.gov.

Configuring Security for Newly Submitted Data

Once you have submitted data to NBIA, then the NBIA administrator must go into UPT to set up security for the image data. You, as the administrator, must create protection elements (PE) and at least one protection group (PG) for the data just submitted. Specifically, you must create a protection element for a collection/project and a separate protection element per site within a collection. All projects must have at least one site.

After the PEs and PGs have been created, you should assign users and or user groups to the PGs. Their access to the imaging data is dependent upon the roles they were assigned in the UPT by an NBIA administrator. For more information, see [Assigning a User/User Group to a Protection Group With Roles](#) on page 54.

Note: While the name of NCIA (National Cancer Imaging Archive) has been changed to NBIA (National Biomedical Imaging Archive), until notified otherwise, the acronym in the UPT configuration remains “NCIA”.

Creating a Protection Element

Tip: You must be an NBIA administrator to perform this task.

You must create two protection elements for the data you just submitted: a protection element for the collection and a second protection element for the site.

Collection Protection Element

1. Open UPT and log in to NCIA.
2. Select the **Protection Element** link at the top of the page.
3. Click the **Create a New Protection Element** link. This opens a dialog box where you enter details for the collection PE you are creating ([Figure 3.3](#)).

ENTER THE NEW PROTECTION ELEMENT DETAILS	
* Protection Element Name	<input type="text"/>
Protection Element Description	<input type="text"/>
Protection Element Type	<input type="text"/>
* Protection Element Object Id	<input type="text"/>
Protection Element Attribute	<input type="text"/>

Figure 3.4 Dialog box for creating a new protection element

4. Enter a **Protection Element Name**.

You must use the project name set during the submission process. You can retrieve this from the DICOM Anonymizer Configurator tab in CTP, or if the `da.script` file has been successfully updated, get the values from there.

Note: Every name must have “NCIA” pre-pended to the project name:
NCIA.{project_name}.

5. Enter the **Protection Element Description**. This “tells” UPT where the protection element name is coming from. The convention is that you **MUST** enter **NCIA.TRIAL_DATA_PROVENANCE** for this field.
6. Leave **Protection Element Type** blank.
7. Enter the **Protection Element Object ID**, which is the same as the PE name.
8. Enter the **PE Attribute**. For a collection you **MUST** enter **NCIA.PROJECT**. For a site, you **MUST** enter **NCIA.PROJECT//DP_SITE_NAME**.
9. Click **Add** to add the PE to UPT.

You must add a PE for both the collection itself and the combination of the collection + site. Some of the NBIA tools don’t just look at what collection data is part of but also where it is coming from. Examples are data for which verifying the submission and QC tools granting access is based on what site it is coming from as well as what collection the data is part of.

You must now create a [Site Protection Element](#) for the same set of submitted images.

Site Protection Element

After you have created a [Collection Protection Element](#), you must also create a site protection element for the same set of submitted images. To do so, follow these steps:

1. Click the **Create a New Protection Element** link, as described in the previous section.
2. In the Enter the New Protection Element dialog box that opens, enter details for the site PE ([Figure 3.3](#)) as described below.

ENTER THE NEW PROTECTION ELEMENT DETAILS	
* Protection Element Name	<input type="text"/>
Protection Element Description	<input type="text"/>
Protection Element Type	<input type="text"/>
* Protection Element Object Id	<input type="text"/>
Protection Element Attribute	<input type="text"/>
<input type="button" value="Add"/> <input type="button" value="Reset"/> <input type="button" value="Back"/>	

Figure 3.5 Dialog box for creating a new protection element

3. Enter the **Protection Element Name**, adding “//” at the end of the name, then enter the site. name: {project_name}://{site name}.

You must use the project name set during the submission process. You can retrieve this from the DICOM Anonymizer Configurator tab in CTP, or if the `da.script` file has been successfully updated, get the values from there.

Note: Every name must have “NCIA” pre-pended to the project name:
NCIA.{project_name}.

- [illegible]

Once data is identified as being part of a protection element, you must assign the PE to

1. Classify the B-1 and the C-137 as either "light" or "heavy" aircraft. (100%)

-
-
-
-
-
-
7. If there are multiple sites for a collection, you might want to create a PG for each site. This process would grant access to verify submissions per site.

You are setting up security to make a collection visible on NBIA and grant users access

1. I # MPT 1 # B 1 d C " f # t

3. Leave the search field blank to find all PGs or enter identifying information for the protection group in the query fields. Click **Search**.
4. Select the PG of interest and click **View Details**.
5. In the details page, click the **Associated PEs** button. This opens a page that displays PEs already associated with the protection group. This page also allows you to add new assignees to the PG.

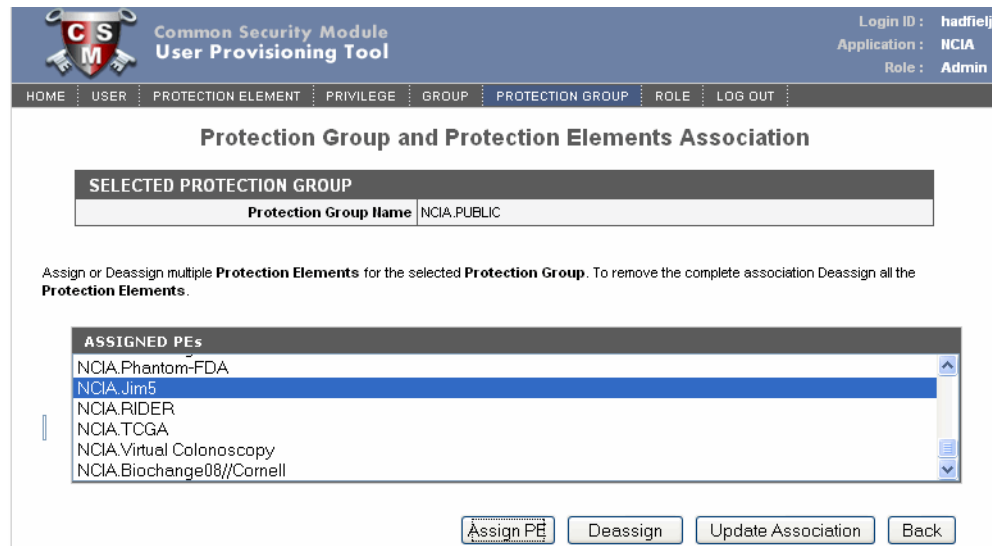


Figure 3.6 UPT page displaying PEs that are part of the selected PG

6. To add a new PE to the selected PG, click the **Assign PEs** button.
7. In the page that opens, enter any appropriate information about the PE you want to assign to the PG, or leave all query fields blank. Click **Search**.

The search results displays protection elements that meet your criteria. All protection elements display if you left the search criteria blank.

8. On the search results page, scroll through the results, if necessary, and select the check box corresponding to the protection element you want to add to the protection group. Click **Assign PE**. Typically, you will do this on a one to one basis, so you would associate one protection element to the group.

Assigning a User/User Group to a Protection Group With Roles

Once the PEs and PGs have been created, the next step is to assign users and/or user groups to a protection group. The users/user groups can be assigned roles by the NBIA administrator when they were created in the UPT or they can be assigned as you complete the steps in this section. For more information, see [Creating a New NBIA User](#) on page 57 as well as the UPT documentation corresponding to the UPT application itself.

The role structure in NBIA is defined as described in [Table 3.1](#):

<i>Role</i>	<i>Functionality</i>
NCIA.READ	Search capability
NCIA.MANAGE_VISIBILITY_STATUS	Privilege to access QC Tool
NCIA.VIEW_SUBMISSION_REPORT	Privilege to access Verify Submission
NCIA.CURATE	Privilege to upload curation status

Table 3.1 Roles that can be assigned in NBIA to users and/or user groups

The roles you assign then allow the user to perform tasks in NBIA.

To assign a user (user group) to a Protection Group, follow these steps:

1. In the UPT home page, click the **Users (Group)** link.
2. Click the **Select an Existing User (Group)** link.
3. Perform a search to locate the user/user group you want to assign to either a user group or to a protection group. You can enter any user detail such as Last Name to launch the search, or launch a search for all users or groups by clicking the **Search** button having entered no details.
4. Select the radio button corresponding the selected user (group) and click **View Details**.
5. To assign a user to a group, click **Associated Groups** at the bottom of the User Details page. Select the group you want to assign to the user, click **Assign**, and **Update Associations** at the bottom of the page.

Note: The advantage of working with user groups is that you do not have to assign roles to each user individually. You can assign users to a user group to which you assign a role, and then assign that user group to the protection group, or you can assign a role collectively to a protection group after it is created.

6. To assign a user (group) to a PG, perform a search to locate the group you want to assign to a PG. See [Step 3](#).
7. Select radio button corresponding to the group and click the View Details button.
8. At the bottom of the page, click **Assign PG and Roles**.
9. In the User (Group), Protection Group and Roles page that opens, click the PG to which you want to assign the User (Group) from the Available Protection

Groups panel (*Figure 3.6*). The PG name moves to the Assigned Protection Group section.

The screenshot shows the 'User Provisioning Tool' interface. At the top, there is a navigation bar with links: HOME, USER, PROTECTION ELEMENT, PRIVILEGE, GROUP, PROTECTION GROUP, ROLE, and LOG OUT. The current page is titled 'User, Protection Group and Roles Association'. Below the title, there is a section for 'SELECTED USER' with a table showing 'User Login Name' as 'hadfield'. Below this, a message states: 'Select a single Protection Group to associate with the selected User.' There is a list of 'AVAILABLE PROTECTION GROUPS' including 'NCIA.ADMIN', 'NCIA.COMBIDEX-VCU', 'NCIA.COMBIDEX-VCU//VCU', 'NCIA.DCEMRI', 'NCIA.GBM Avastin', and 'NCIA.Head-Neck Cetuximab'. Below the list are 'Assign' and 'Deassign' buttons. At the bottom, there is a section for 'ASSIGNED PROTECTION GROUP' showing 'NCIA.IDRI//MSKCC'.

Figure 3.7 Page for assigning a user to a PG. The page for assigning a group to a PG is similar, with the term “user” replaced by “group”.

10. Click the **Assign** button.
11. Scroll further down on the page, to the Available Roles section. Select the appropriate role(s) for the user (group) in that PG and click the **Assign** button to move it to the Assigned Roles section.
12. Click the **Update Association** button at the bottom of the page to confirm your selections.
13. To verify that this user (group) has been appropriately assigned to the Protection Group, they should log into NBIA. On the search page, the collection assigned to this protection group should appear on the Simple and Advanced Search pages under Collections. For more information, see *Performing Searches* on page 17.
14. The appropriate access and assigned roles can also be verified in the Verify Submissions and QC Tools sections in NBIA.

Alternative Image Configuration/Submission Methods

You can use several other alternative methods for configuring and submitting images to the CTP client and/or servers. An example is the PACS radiology machine which takes DICOM images and sends them directly to a CTP server, circumventing the need to send the images and accompanying patient information over the internet. For more information about using these alternative submission methods, contact NCICB Application Support: <http://ncicb.nci.nih.gov/NCICB/support>.

CHAPTER 4

NBIA ADMINISTRATION

This chapter discusses administration functions in NBIA.

Topics in this chapter include:

- [Administration Functions Overview](#) on this page
- [Creating a New NBIA User](#) on this page
- [Using the Quality Control \(QC\) Tool](#) on page 58
- [Uploading and Parsing the Curation Spreadsheet](#) on page 61
- [Verifying Submitted Files](#) on page 61

Administration Functions Overview

Note: Administration privileges for NBIA 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 Admin privileges logs into NBIA. Admin tasks display as hypertext links under the left sidebar **Tools** menu. Their use is described in the appropriate sections that follow in this chapter.

Creating a New NBIA User

Only an NBIA administrator can create new users for NBIA, and this must be done in the separate Common Security Module (CSM) User Provisioning Tool (UPT) application. NBIA, as do other applications, installs with its own CSM schema that has sample/default users and a role/permissions structure.

Note: While the name of NCIA (National Cancer Imaging Archive) has been changed to NBIA (National Biomedical Imaging Archive), until notified otherwise, the acronym in the UPT configuration remains “NCIA”.

Before NBIA users can be created, a UPT administrator must register the NCIA application in the UPT and assign an admin user to the NCIA application there. Then, the NCIA administrator can assign users to NBIA and roles to each user. This is done by opening user details and clicking the **Assign PG and Roles** button at the bottom of the user details page. The role structure in NBIA is defined as described in Table 4.1:

<i>Role</i>	<i>Functionality</i>
NCIA.READ	Search capability
NCIA.MANAGE_VISIBILITY_STATUS	Privilege to access QC Tool
NCIA.VIEW_SUBMISSION_REPORT	Privilege to access Verify Submission
NCIA.CURATE	Privilege to upload curation status

Table 4.1 Roles that can be assigned in NBIA to users and/or user groups

The roles you assign then allow the user to perform tasks in NBIA. Additionally, an NBIA administrator can perform the following tasks, described in this chapter:

- Assign a user right to use the QC tool for the purpose of reviewing submitted imaging data and managing visibility status for the data. See *Using the Quality Control (QC) Tool* on page 58.
- Assign a user to a curation group for using curation tool for imaging data. For more information, see *Uploading and Parsing the Curation Spreadsheet*
- Verify submitted files. This includes the permission to view the image submission report which includes submission statistics and information regarding what has been received by the image repositories. See *Verifying Submitted Files* on page 61.
- Configuring security for data submitted to NBIA. For more information, see *Configuring Security for Newly Submitted Data* on page 51.

For more information about creating new NBIA users/user groups and performing other tasks in the UPT, contact NCICB Application Support: <http://ncicb.nci.nih.gov/NCICB/support>. They can tell you how to access the UPT as well as help you locate user documentation for the application.

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 NBIA, 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 NBIA 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.

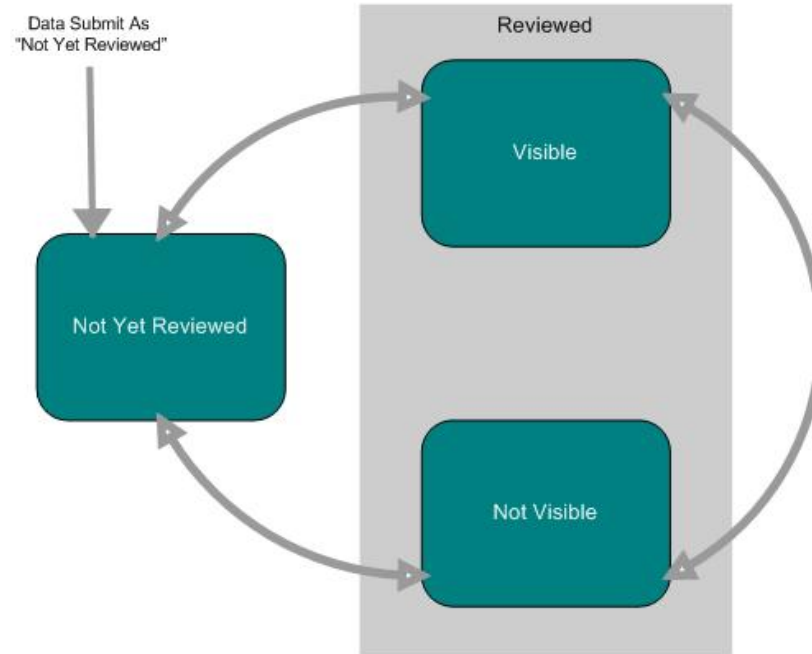


Figure 4.1 This illustration displays the workflow states of data curation

The diagram depicts the various states where data can be and the transitions between those states (Figure 4.1).

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, collections, patients, studies and series.

QC TOOL NAVIGATION TREE

- Not Yet Reviewed
 - Collection: DCEMRI
 - Collection: LiverCT
 - Collection: RIDER
 - Patient: 1.3.6.1.4.1.9328.50.2.0091
 - Patient: 1.3.6.1.4.1.9328.50.2.0146
 - Patient: 1.3.6.1.4.1.9328.50.2.0208
 - Patient: 1.3.6.1.4.1.9328.50.2.0210
 - Patient: 1.3.6.1.4.1.9328.50.2.0211
 - Patient: 1.3.6.1.4.1.9328.50.2.0212
 - Patient: 1.3.6.1.4.1.9328.50.2.0213
 - Patient: 1.3.6.1.4.1.9328.50.2.0214
 - Study: 1.3.6.1.4.1.9328.50.2.347206
 - Study: 1.3.6.1.4.1.9328.50.2.347210
 - Study: 1.3.6.1.4.1.9328.50.2.347702
 - Study: 1.3.6.1.4.1.9328.50.2.347784
 - Study: 1.3.6.1.4.1.9328.50.2.348122
 - Study: 1.3.6.1.4.1.9328.50.2.348138
 - Patient: 1.3.6.1.4.1.9328.50.2.0215
 - Patient: 1.3.6.1.4.1.9328.50.2.0216
 - Patient: 1.3.6.1.4.1.9328.50.2.0217
 - Patient: 1.3.6.1.4.1.9328.50.2.0218
 - Patient: 1.3.6.1.4.1.9328.50.2.0219

HOME SEARCH IMAGES REMOTE SEARCH MANAGE DATA BASKET HELP LOGOUT Logged In As hadfieldj

Studies for 1.3.6.1.4.1.9328.50.2.0214

QC Status: Not Yet Reviewed

CHANGE QC STATUS

*QC Status: Comments:

<input type="checkbox"/>	Study Instance UID	Show Series for Study
<input type="checkbox"/>	1.3.6.1.4.1.9328.50.2.347206	Show Series
<input type="checkbox"/>	1.3.6.1.4.1.9328.50.2.347210	Show Series
<input type="checkbox"/>	1.3.6.1.4.1.9328.50.2.347702	Show Series
<input type="checkbox"/>	1.3.6.1.4.1.9328.50.2.347784	Show Series
<input type="checkbox"/>	1.3.6.1.4.1.9328.50.2.348122	Show Series
<input type="checkbox"/>	1.3.6.1.4.1.9328.50.2.348138	Show Series

Figure 4.2 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 4.2*). That is the segment of the page where you can perform actions that manage the status and hence, the visibility of the selected component.

- 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 4.2*).
- 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 Table 4.2:

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

Table 4.2 Status options for NBIA images

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

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

The QC status history that displays shows all changes have been made to the status of this image (*Figure 4.3*). When a change is made to data status in NBIA, an email is automatically generated to the user.

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

Date	User	Comment	Old Value	New Value
Aug 15, 2006	shinohaa@mail.nih.gov	s	Not Yet Reviewed	Send to Curation
Aug 15, 2006	shinohaa@mail.nih.gov	g	Send to Curation	Not Yet Reviewed

Figure 4.3 QA Status History

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

5. 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/>
6. To view a full-size copy of the image in JPEG format, click the **View Full Size JPEG** button.

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 curation privileges.

A user with Admin Curator privileges can upload 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.

NBIA 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 view submission report privileges.

When a site submits images to NBIA, a user with admin privileges can verify that the images have been received and monitor the status of the submitted images. This is accomplished in NBIA 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.

Verify Submission 

SEARCH CRITERIA		
Collection-Site	Available	Selected
	LIDC-LIDC LiverCT-GeorgetownU NCRH-NHS Phantom-FDA-FDA Phantom-WashU-HRL RIDER-MDACC RIDER-MSKCC	<div style="text-align: center;">  SELECT > SELECT ALL >> << REMOVE ALL < REMOVE </div>
Date (mm/dd/yyyy)	From: 08/12/2008 	To: 11/12/2008 




 **SUBMIT**
 **RESET**





Figure 4.4 Verify Submission page for submitting a search

2. On the Verify Submission page that opens ([Figure 4.4](#)), the **Collection Site** section displays all collections for which you, as an Admin, have permissions to view. In the **Available** panel, select one or more collections and click **Select >** to move your selection to the **Selected** panel.

Note: If you have permissions for just one collection, no collections list will be displayed on this page. You will still have the option to select a date range that will search the collection for which you have permissions.
3. Enter the appropriate information for the **Date Range** fields, **From** and **To**, in the Search Criteria form.
4. Press the **Submit** button. The search may take a few moments.
5. Click **Reset** to clear your selection(s) so you can begin again.

Once completed, the report displays below the Verify Submission form (*Figure 4.5*).

Verify Submission 

SEARCH CRITERIA											
Date (mm/dd/yyyy)	From: 06/01/2007 	To: 07/15/2007 									
 SUBMIT  RESET											

Submission Status

Please contact [Application Support](#). Telephone: 301-451-4384 or toll free: 888-478-4423
Email: ncicb@pop.nci.nih.gov for help regarding any quarantined files.

Project-Site											
RIDER-MDACC											
Date	New Patients	Updates Patients	New Studies	Updated Studies	New Series	Updated Series	Not Yet Reviewed Images	Visible Images	Not Visible Images	Annotation	Quarantined Files
Jun 21, 2007	6	1	26	0	129	0	16951	0	0	0	0
Jun 22, 2007	10	7	67	16	264	2	29100	0	0	0	0
Jun 23, 2007	0	9	26	12	55	2	6132	0	0	0	0
Jun 25, 2007	6	0	49	0	168	0	16556	0	0	0	0
Jun 28, 2007	1	0	4	0	16	0	1208	0	0	0	0

	New Patients	Updates Patients	New Studies	Updated Studies	New Series	Updated Series
Totals:	23	17	172	28	632	4

Unknown Site Quarantined Files	0
--------------------------------	---

Note: Unknown site quarantined files are quarantined files for which the project-site cannot be determined.

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Figure 4.5 Verify Submission search criteria and search results

After you have submitted a query for verifying submitted files, the results include the following information, grouped by project site in table format. Fields are described in Table 4.3:

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: <ul style="list-style-type: none"> 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 Using the Quality Control (QC) Tool on page 58.
Annotation	Number of annotation files represented in search results

Table 4.3 Description of fields in search results for verifying submission to NBIA

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.

Configuring Remote Node

The following information is to be used by an NBIA administrator.

To make an NCIA instance aware of other grid nodes, populate the GRID_NODE table. The columns are as follows:

- GRID_NODE_PK_ID – the primary key of the grid node – a unique number
- NODE_NAME – string describing the node
- URL – URL to the grid services. It will follow this format:
 - <http://{HOSTNAME}:{PORT}/wsrf/services/cagrid/NCIAQueryService>
 - HOSTNAME = the hostname of the Globus server
 - PORT = the port number that Globus runs on. This is typically 8080.

APPENDIX

A

URL REFERENCES

This chapter lists URLs associated with NBIA.

- *FTP Client Software Products* on this page
- *DICOM* on this page
- *Cedara* on this page
- *NBIA* on page 66

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://www.osirix-viewer.com/>
4. ClearCanvas Workstation: <http://www.clearcanvas.ca/dnn/>

Cedara

Cedara I-Response Workstation (IRW): https://eforge.nci.nih.gov/frs/?group_id=312

NBIA

1. NBIA access: <http://imaging.nci.nih.gov>
2. NBIA portal site: <http://ncia.nci.nih.gov>

APPENDIX B NBIA GLOSSARY

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

<i>Term</i>	<i>Definition</i>
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
NBIA	National Biomedical Imaging Archive
NCICB	National Cancer Institute Center for Bioinformatics
WAR	Web Application Resource

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