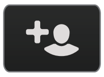
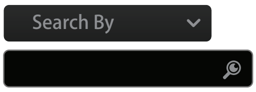
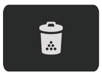
Function	Description
[Emergency Exam] 	Begins an exam without selecting a procedure from the Patient List or adding the patient. The system will assign a unique tracking number as the Patient Name. **Note:** The tracking number is the date and time the exam was initiated. The time is recorded to the second. Refer to 第 9 章：Image Acquisition-Conducting an Emergency Exam for more information.
[Procedure List]	Shows all procedures scheduled for exams during a working day. Procedures on the list may be downloaded from the RIS/HIS or may be created locally on the workstation. Refer to Patient Worklist for more information. The list may be searched, or filtered, sorted by column. Refer to Managing List/Finding Procedures for more information. The displayed time period is configurable. Refer to Chapter 16: Set Preferences - Worklist for information on changing the time period displayed.
[Add Patient] 	Allows you to enter patient information and add the patient to the Patient List. Refer to Adding/Editing/Viewing Patient Information for more information.
[Sort By]	Refer to Sorting by Column for more detailed information.
[Search By] 	Searches for procedures by the selected the column name in the drop-down list and the search criteria entered into the text box. Refer to Searching By for information on searching the list.
[Delete] 	Removes the selected procedure or procedures from the Patient List. **Note:** [DELETE] does not remove procedures from the RIS or HIS. [DELETE] does not remove any exam images from the image database. Refer to Deleting Procedures for more information.
[Start Exam/Next] or [Resume Exam]	Starts, continues, or appends the selected procedure. The button name changes depending on the Scheduled Status of the selected procedure. If the selected procedure has a status of "Suspended", the button name changes to [RESUME EXAM].

Patient Worklist

Table 8-2 describes the columns on the Worklist. This information comes from what has been entered in the Patient Information screen. For detailed information, please refer to Adding/Editing/Viewing Patient Information.

Table 8-2 Worklist columns

Item	Description
[Patient Name]	The full name of the patient as entered in Add Patient/Patient Information screen.
[Patient ID]	The patient's medical record number or any number that distinguishes the patient.
[Date]	The date the procedure is scheduled to occur. On locally added procedures, the current date is the default.
[Accession]	The patient's accession number.
[Exam Type]	Patient's exam protocol.
[Physician]	The name of the primary physician of the patient.
[Gender]	The gender of the patient. By default, "Other" is selected when the screen first opens.
[Status]	The status of the procedure. Available options are: • Scheduled - Procedure has been created but not started. • Completed - Procedure has been closed. • Suspended - Procedure was started then interrupted. • Discontinued - Procedure was opened but cannot be completed. • In progress - Procedure is currently in progress. Refer to Chapter 9: Image Acquisition - Close Exam for more information about Completed, Suspended, and Discontinued exams.

Re-size Columns（Monitor/Mouse Control）

Columns in the patient list may be re-sized in order to reveal more information, such as patient’s entire name.

1. Use the mouse to move the pointer to between two column headings.
- The cursor changes from an arrow to a re-size indicator.
2. Click and drag the re-size indicator left or right to increase or decrease the column width.
3. Release the mouse button when column is the correct width.
4. Repeat for any other columns you want to re-size.

Managing List/Finding Procedures

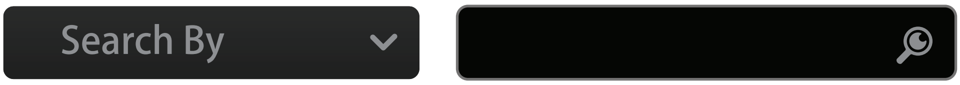
The Worklist has several features that allow you to find patients and procedures quickly and to organize the list to your preferences.

Search By, Filters, and Sorting allow you to control the display of the procedures in the Worklist.

Searching By

The Search by feature finds procedures by column.

Figure 8-2 Search by



1. Click the arrow on the Search by drop-down list to select the column you want to search.
   - If the column you want is already selected, begin at step 3.
2. Select the column. For example, Patient Name.
   - The list automatically sorts the selected column.
3. Type the search criteria into the text box. For example, you are looking for patients whose names begin with “J”, so you would type “J” into the text box.
   - The list automatically goes to the first procedure whose patient’s name begins with “J” and selects it.
   - If the list is long enough, it will scroll to the first item so that it appears at the top of the list.

Note: The text box is not case sensitive.

4. Continue typing the search criteria.
   - The list automatically selects the first procedure that matches what you have typed into the text box. This is called an incremental search.
   - If no procedures match what you have typed, the list de-selects all procedures and places the closest match at the top of the Worklist.

Sorting by Column

Sorting allows you to organize the procedures by the column of your choice.

1. Click on the column heading you want to sort, or choose the column in the Search By drop-down list. For example, you want to see all the procedures that have a status of "Suspended", so you click on the "Scheduled Status" column heading.
   - An arrow appears in the column heading to indicate which column is currently being sorted.
2. Click the column heading again to switch between ascending and descending order.
   - An up-pointing arrow indicates that the column is sorted in ascending order. That is, sorted in alphabetical order or numerical order from smallest to largest.
   - A down-pointing arrow indicates that the column is sorted in descending order. That is, sorted in reverse alphabetical order or numerical order from largest to smallest.

Figure 8-3 Column with descending sort

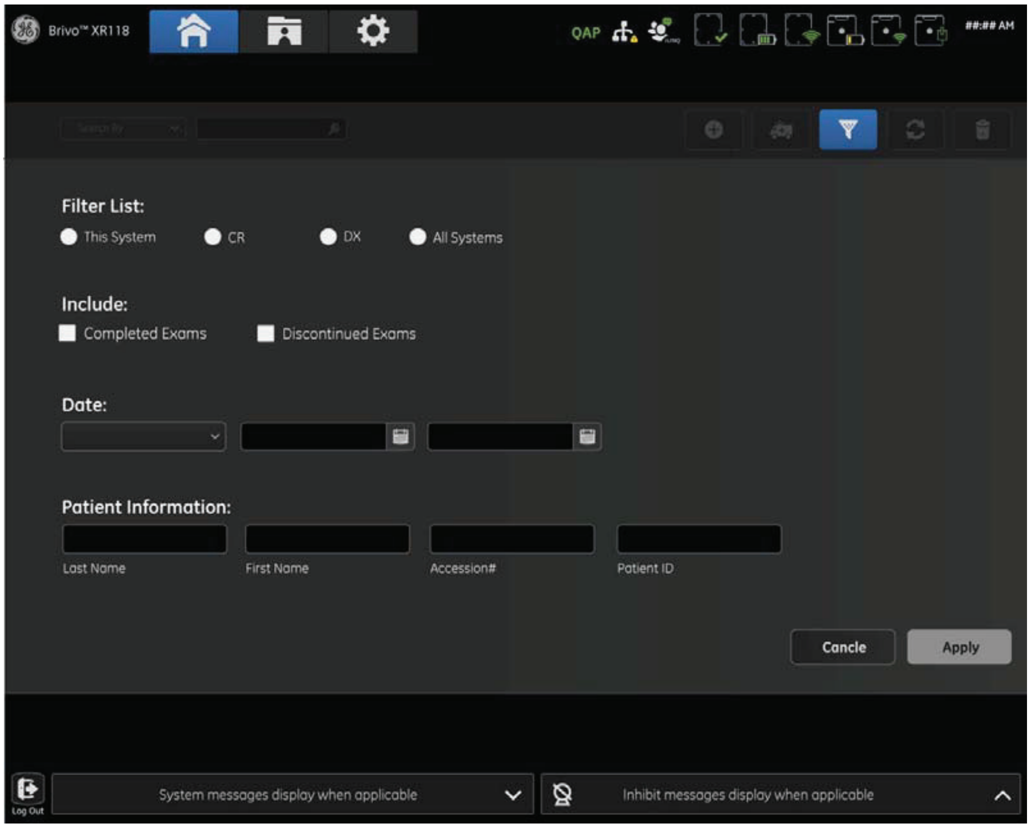
Filter list

Use filters to only display the items corresponding to your chosen criteria, e.g., exams taken only within a specified time period, patients whose last names begin with the letter ‘J’, or patient IDs beginning with the digits ‘547’.

Filters cannot be saved.

Pressing Refresh button will remove any filter that has been applied.

Figure 8-4 Worklist filter



The filter screen has several options for accepting or rejecting the information from the Worklist. The table below describes the filter screen functions.

Table 8-3 Filter Acceptance/Rejection Buttons

Function	Description
[Filter List]	Filters the Worklist items by system or modality. • This system: Procedures entered locally on the unit. • CR/DX: Procedures for computed radiography/digital x-ray. • All system: Procedures for all modalities.
[Include]	Allows you to include or exclude completed or discontinued exams in the filter.
[Range]	Allows you to select the date of exams to filter by. • All: Procedures scheduled for any date. • Range: Procedures scheduled for a specified range of time. • Today: Procedures scheduled for the current date.
[From/To]	When the "Range" option is selected for the date, allows you to enter dates or pick dates from a calendar screen.
[Patient Information]	Allows you to filter based on data from the Patient Information screen. Options are: • Last Name • First Name • Accession # • Patient ID The filter may be restricted by any or all of these fields. Leaving a field blank means that it will not be included in the filter.
[Filter]	Applies the filter and returns you to the results on the Worklist.
[Cancel]	Clears the Filter screen and returns you to the Worklist.

Follow this procedure to filter the Worklist.

Note: The fields may be completed in any order.

1. Click filter list button [] on the Worklist screen.
   - The Filter Screen appears.
2. Select the "Filter list" option.
3. Select the "Include" options.
4. Select the "Date" option.

5. If you selected “Range” for the Date option, enter or select the From /To dates.
   - The current date appears in both the From/To fields by default.

To select dates from the calendar:

- Click the [CALENDAR] button.
- The Filter calendar screen appears with the current date selected.Filter calendar screen.

   a) Click [] to select the previous month, if necessary.

   b) Click [] to select the next month, if necessary.

   c) Click a date to select it.
      - The calendar closes automatically when a date is clicked.

   d) Click [CLOSE] to return to the Filter screen.

6. Enter any Patient Info you want to filter by.
   - You do not need to enter full words or numbers into these fields.
   - Entering more information into these fields will reduce the number of results.
   - Entering less or no information into these fields will increase the number of results.

Note: The Patient Info text boxes are not case sensitive.

7. Click [OK].
   - Show List for screen closes and the Worklist screen appears with only those procedures that met all of the filtering criteria.
   - If no procedures met all the criteria, the Worklist will be blank with a popup message “No filter results found. Please try a different criteria.”
8. Click refresh button [] to remove the filter.

Refresh

Some systems will automatically refresh the Worklist with data from the HIS/RIS on a regular basis (such as every 10 minutes). However, if your system does not automatically refresh - or you want to refresh the list before the scheduled time - you are able to refresh the list manually.

The Refresh feature also removes any filtering that has been applied. More information, please refer to Filter list.

Manual Refresh

Follow this procedure to manually refresh the Worklist.

1. Click the refresh button on the Worklist.
   - The Worklist updates with HIS/RIS data and removes any filtering.

Note: You will not be able to make selections or access Worklist features while the worklist is refreshing.

Note: Refresh does not remove locally added procedures.

Auto Refresh

The Auto Refresh interval is set on the [Utilities]->[Preferences]->[Worklist]. More information, please refer to Chapter 16: Set Preferences - Worklist.

When the system auto refreshes, a message appears: “Auto Refresh in progress. Please wait.” The message remains until the refresh process is complete.

Note: You will not be able to make selections or access Worklist functions while the worklist is refreshing.

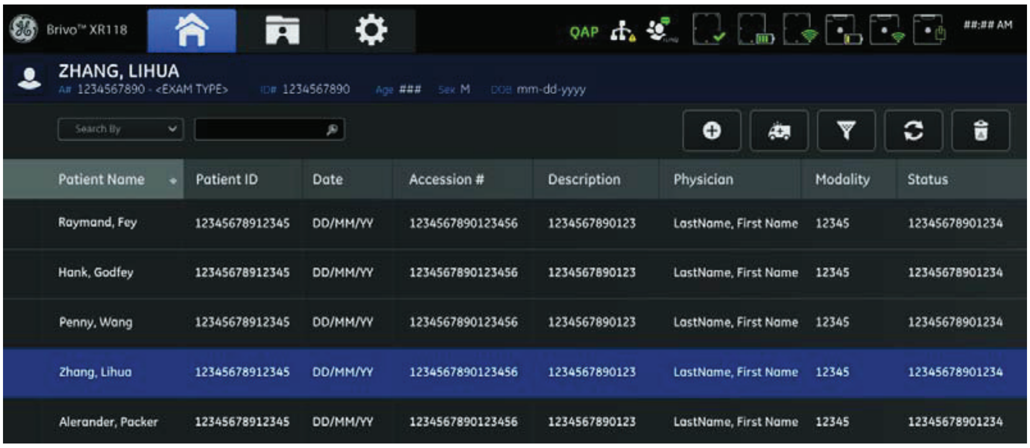
Figure 8-5 Auto refresh message

Selecting Procedures

Use the following procedure to select a patient from the Worklist. This process assumes the patient already exists on the system. If the patient is not on the worklist, you must add the patient first. More information, please refer to Adding patient.

Selecting a single procedure

Figure 8-6 Single procedure



1. Close or suspend any open exams, if necessary.
   - The Worklist screen appears.
2. Select the procedure from the Worklist.
   - This can be done by clicking on the patient' s name from the list or aiming the bar code scanner at the patient' s bar code generated by the HIS/RIS system.
3. Refer to Chapter 9: Image Acquisition to conduct the exam.

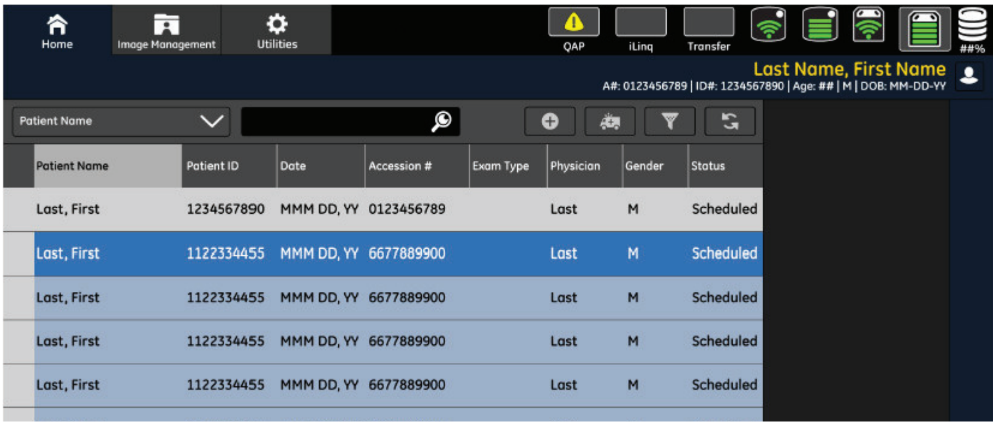
Selecting multiple procedures

You may select multiple procedures for the same patient to begin image acquisition.

Note: The Patient Name, Patient ID, Birth Date, Gender and Exam Date must match exactly in order to be selected.

1. Sort the Worklist by Patient Name.
2. Click on a procedure.

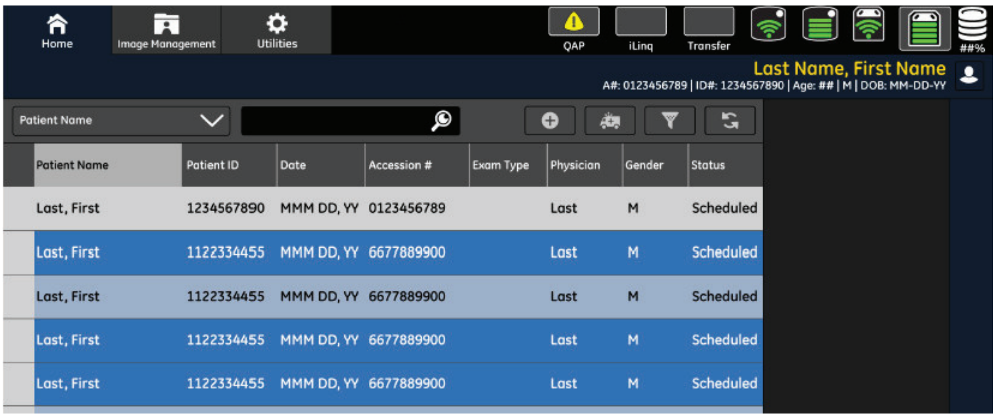
Figure 8-7 Select a procedure



- If an exam is selected (Highlighted in dark blue), all associated items (Highlighted in light blue) are listed right after this exam.

3. Click on another procedure for the same patient.
4. Continue clicking on procedures until all procedures for the patient are selected.

Figure 8-8 Select multiple procedures



5. Click on any other procedure to deselect the procedures.

Deleting Procedures

You may remove procedures from the Worklist individually.

The delete button [ ] is able to access delete mode and to delete procedures.

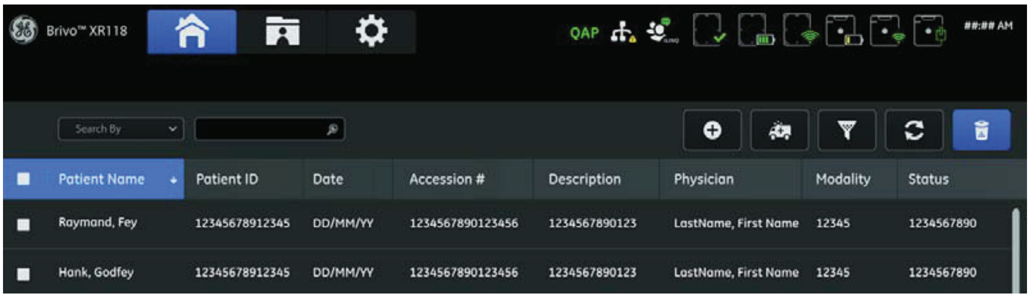
Note: Deleted procedures cannot be recovered or "undeleted."

Note: [DELETE] does not remove procedures from the RIS or HIS, and does not remove any exam images from the image database.

Deleting a procedure

1. Click the delete button [ ] to access delete mode.
2. A deleting checkbox shows at the left of the patient name.

Figure 8-9 Delete procedure



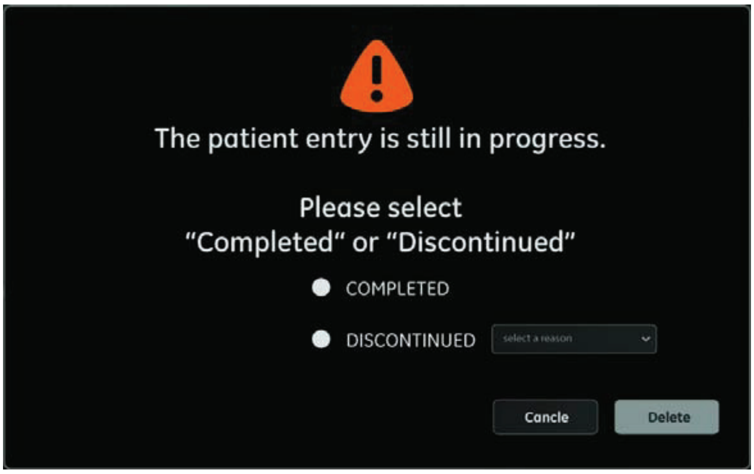
3. Select the deleting checbox and then click the delete button [ ] to remove the selected procedure.

Note: [DELETE] does not remove procedures from the RIS or HIS, and does not remove any exam images from the image database.

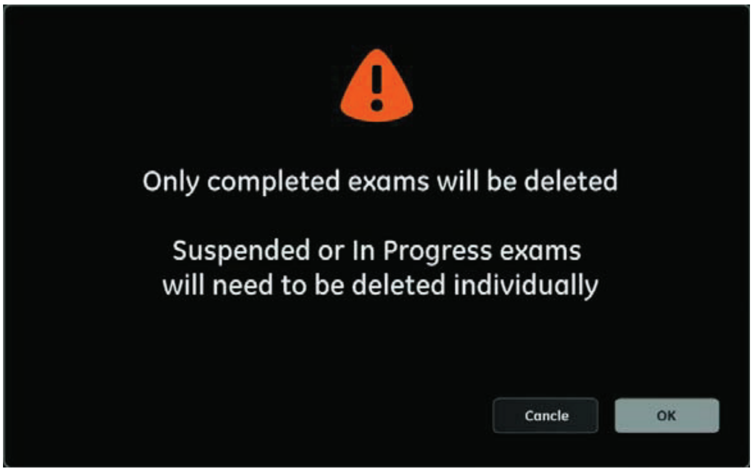
Deleting suspended procedures

Suspended procedures cannot be deleted unless their status is changed to "Completed" or "Discontinued".

1. Select the suspended procedures to delete.
   - For single suspended exam, a message appears:



   - For multiple suspended exams, a message appears:



2. Click [Completed] or [Discontinued].
   - [Completed] changes the status to of the procedures to "Completed." If enabled, any acquired images are auto pushed, auto printed, and sent to PACS.
   - [Discontinued] changes the status to "Discontinued." Any acquired images are marked as Discontinued and the information is sent to PACS. Select a appropriate reason from [select a reason].
   - [Cancel] closes the message and returns you to the Worklist without deleting procedures.
   - [Delete] Removes the procedures from the Worklist.

   - Suspended exams will need to be deleted individually.

Adding/Editing/Viewing Patient Information

Overview

The Add Patient and Patient Information screens (Figure 8-10) allow you to enter patient and procedure information before starting an exam or to view the information at any time.

Note: This screen may also be known as the Medical Procedure Card or MPC.

- To add a patient to the worklist, click add patient button [ ] and enter or select the appropriate information. The information can be entered by two methods: manually or with a bar code reader.

CAUTION: Make sure the patient' s name, ID number, birth date, and gender information are entered correctly.

Note: Use only standard alphanumeric characters to complete the screen. The use of a question mark (?), forward slash (/), etc., results in an illegal character error message.

- To view the patient information from the Worklist or Image Management screens, select the exam then click patient information button []. Patient information is not editable when launched from the Image Management screen.
- To view the patient information from the Acquisition or Image Viewer screens, click patient information button [ ]. Patient information is not editable when launched from these screens.

The screen appears on the same monitor where patient information button [ ] was clicked.

Patient Information provided by the HIS/RIS is not editable.

Patient Information entered locally is editable until the exam is started. It is not editable after the exam is started or in progress.

Note: The Patient Information button is unavailable when multiple exams are selected at the same time.

Note: If the total length of Patient First Name, Middle Name and Last Name is more than 30 characters, manual patient entry will be required.

Figure 8-10 Add/Edit/View Patient Information

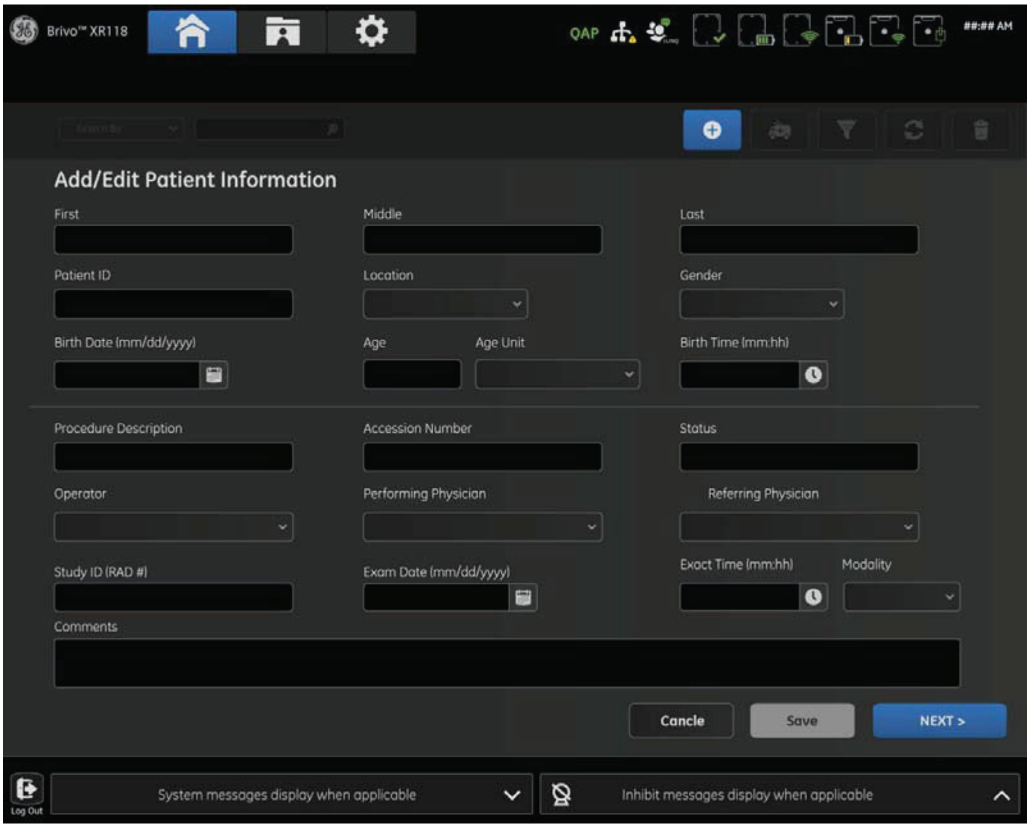


Table 8-4 Patient Information

Function	Description
[First]	Identifies the patient's first name.
[Middle]	Identifies the patient's middle name or initials.
[Last]	Identifies the patient's last name. **Note:** Emergency Exams automatically fill this field with a system-generated identification, which is the word "NEW" followed by a date and time stamp of the second the Emergency Exam button was clicked. For example: NEW040622140345. The exam was initiated in year 04, month 06, day 22, hour 14, minute 03, and second 45.
[Patient ID]	Identifies the patient's medical record number or any number that distinguishes the patient. This number must be unique.
[Location]	Identifies the patient's location. The HIS or RIS usually completes this field.

Function	Description
[Gender]	Defines the sex of the patient. By default, "Other" is selected when the screen first opens.
[Birth Day]	Identifies the patient's birthday in the format dd/mm/yyyy. If the date is not entered in the correct format, the screen will show the date field in red when [START EXAM] or [SAVE] is clicked.
[Age]	Identifies the patient's age. The field updates with the correct age when the Birth Date is entered. Entering the Age manually will clear the Birth Date field.
[Age Unit]	Age unit, four options: Year, Month, Week and Day. if [Age] field updates with the correct age according to the Birth Date field, [Age] field also updates when this field changes.
[Birth Time]	Identifies the patient's birth time in the 24-hour format HH:MM.
[Procedure Description]	Describes the procedure or series to be performed.
[Accession Number]	Identifies the patient's accession number.
[Status]	Displays the status of the selected exam. When adding a patient, the only option is "Scheduled". Patient Information options are: • Scheduled: The procedure has been added to the worklist, but the exam has not started. • Suspended: An exam was started but interrupted before completion. The exam may be resumed at a later time. • Complete: The exam is one that has been "Closed" on the Acquire screen or marked as "Complete" on the Patient Information screen. Completed exams are sent to the PACS (where available). • Discontinued: The procedure was opened, but no exposures were taken. The exam may be started at a later time or the procedure deleted. • Active: The exam is currently in progress. If the status is "Scheduled", "Active", or "Suspended", the status may be changed to "Discontinued" or "Complete" for exams that are not open or in acquisition. Status is not editable for the following conditions: • If the status is "Complete" or "Discontinued". • If Patient Information is opened from the Image Viewer or Image Management screens.

Function	Description
[Operator]	Identifies the operator' s name or initials. You can use the drop-down list to select commonly used names, or type the name into the drop-down list box. Refer to Chapter 16: Set Preferences - Viewer for information on adding names to the drop-down list.
[Performing Physician]	Identifies the Radiologist or performing physician. You can use the drop-down list to select commonly used names, or type the name into the drop-down list box. Refer to Chapter 16: Set Preferences - Viewer for information on adding names to the drop-down list.
[Referring Physician]	Identifies the referring physician. You can use the drop-down list to select commonly used names, or type the name into the drop-down list box. Refer to Chapter 16: Set Preferences - Viewer for information on adding names to the drop-down list.
[Study ID （RAD#）]	Displays the procedure ID number.
[Exam Date]	Displays the scheduled date of the selected exam.
[Exam Time]	Defines the date and time for the patient' s exam to be performed.
[Modality]	Displays the modality of the exam.
[Comments]	Provides a space for any notes or information not listed in any other field.
[Next]	Displays the Acquisition screen in preparation for making exposures. This also adds the patient name to the Worklist. More information, refer to Chapter 9: Image Acquisition - Selecting or Changing Protocols. **Note:** This button does not appear if the Patient Information screen is opened from the Image Viewer or Image Management screens.
[Save]	Adds the patient to the Worklist or saves changes and closes the Add Patient/Patient Information screen. • If the Save button is selected but all of the data fields have not been filled in, a new patient is created anyway. • If no patient name has been entered, then the patient name will be listed as "New Patient" . This allows you to start an exam quickly.
[Cancel/Close]	Erases all newly entered information and closes the Add Patient/Patient Information screen without updating the Worklist.

Adding patient

Use this procedure to enter the patient's information into your system.

1. Open the Worklist screen.
   - The Patient Worklist screen appears.
2. Click add patient button [ ].
   - The Add Patient Information screen appears.
3. Enter the patient information using the keyboard/virtual keyboard.
   - Data many be entered manually or with a bar code reader. Refer to Chapter 6: Hardware Overview - Bar Code Reader for more information.

Note: For multilanguage input operating process, refer to Chapter 4: Quick Step Guide.

CAUTION: Make sure the patient's name, ID number, birth date, and gender information are entered correctly.

4. Click [SAVE] or [Next].
   - Click [SAVE] to add the patient to the Worklist and return to the Worklist screen.
   - Click [NEXT] (if available) to add the patient to the Worklist and begin to select the exam protocols. Please refer to Chapter 9: Image Acquisition - Selecting or Changing Protocols.
   - Click [CANCEL] to close the Add Patient screen without saving changes.

Note: For a new exam on an existing patient, the patient information cannot be edited.

Editing patient information

Patient information can only be edited before any procedure has been opened.

Note: Patient Information button is disabled if multiple procedures are selected.

1. Select the procedure from the Worklist.
2. Click patient information button [ ].
   - The Patient Information screen appears.
3. Edit the information as necessary.
4. Click [SAVE] to record the changes and return to the Worklist.
   - Clicking [CANCEL] closes the Patient Information screen without saving changes.

CAUTION: Please check the patient information carefully before starting a procedure. You cannot edit the information again after a procedure has been opened.

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Chapter 9
Image Acquisition

This section details the process of acquiring images using the digital detector.

Note: This section covers conducting a basic exam.

Contents included:

Overview

The Acquisition screen (Figure 9-1) is where the exam is set up and exposure details are adjusted. This screen appears when you click the [START EXAM], [EMERGENCY EXAM] buttons on the Worklist or [START EXAM] from the Add Patient screen and select the protocol.

Figure 9-1 Acquisition screen

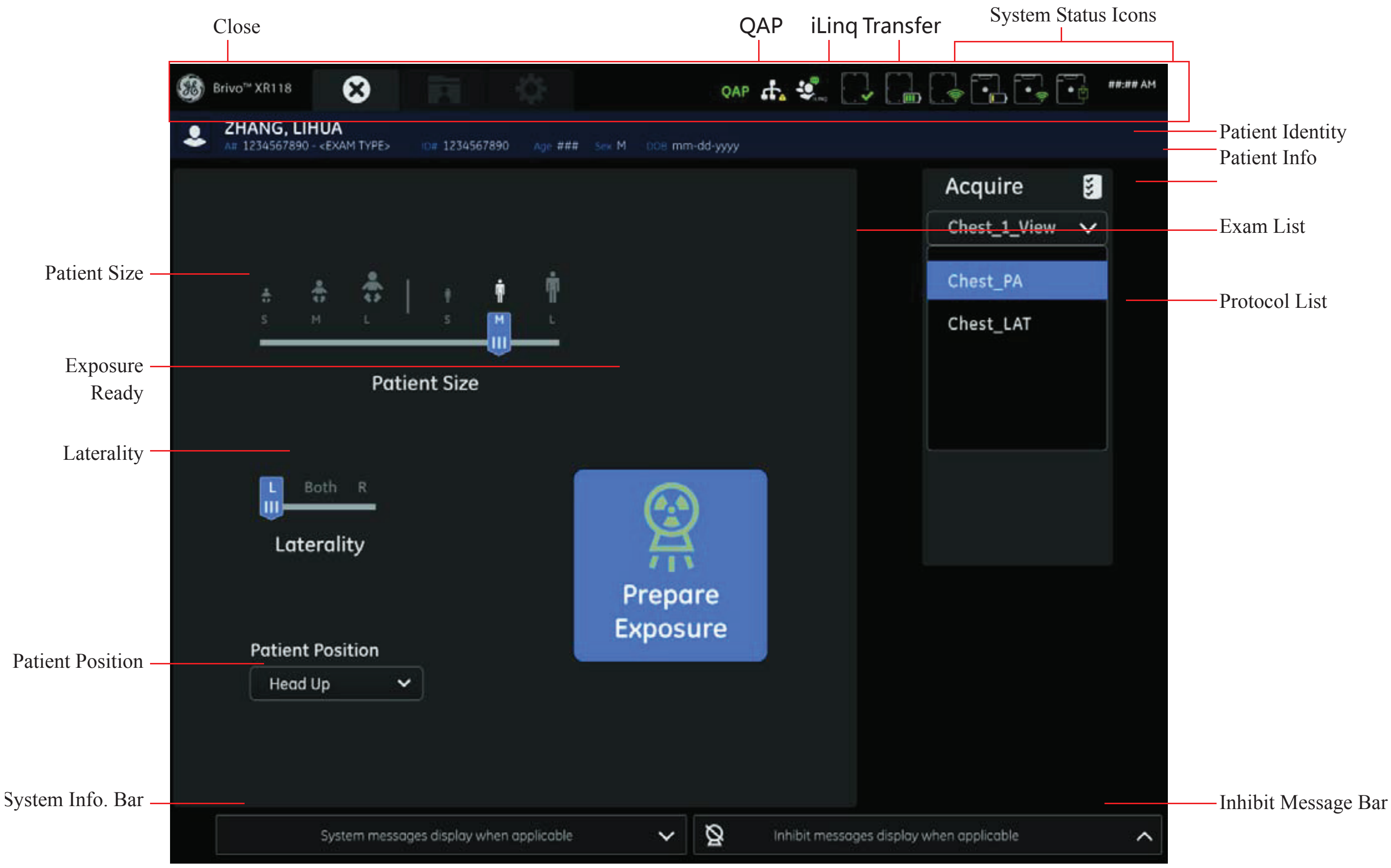


Table 9-1 Acquisition screen

Function	Description
[Close]	Closes the procedure. Refer to Close Exam for more information.
[Patient Identity]	Identifies the patient for the current procedure.
[Patient Information]	Displays Patient Information screen for the current procedure. Refer to Chapter 8: Worklist - Adding/Editing/Viewing Patient Information.

Function	Description
[Exam List]	Displays all exam lists if multiple exams are selected for one patient. Click the down arrow to open the exam list and select one exam.
[Protocol List]	Lists the available views for the exam and shows which view is currently active. Item highlighted in blue means the current selected exam protocol.
[Protocol Selection]	Brings up the Select Protocols screen to add, remove, or change protocols. Refer to Selecting or Changing Protocols for more detailed information.
[Patient Size]	Allows you to choose the size of the patient being x-rayed. Available options are: • Small Pediatric (infants up to 1 year old) • Medium Pediatric (toddlers to 5 years old) • Large Pediatric (school-age children) • Small Adult • Medium Adult • Large Adult
[Laterality]	If conducting an exam on paired anatomy (for example, extremities), selects the side of the patient being x-rayed. Options are: • Both • Left • Right If conducting an exam on unpaired anatomy, the control is disabled, as shown here.
[Patient Position]	Selects the patient position relative to the detector. The available options change if the currently selected protocol view is for paired or non-paired anatomy. For paired anatomy, the options are: • Digits to Head • Digits to Feet • Digits to Front • Digits to Back For non-paired anatomy, the options are: • Head Up • Head Down The above lists of positions paired and unpaired anatomy are a general guidelines only. Some views have different options.

Function	Description
[Exposure Preparation/ Exposure Ready]	Click the [Prepare Exposure] button to get the device ready to receive x-ray. “Exposure Ready” page will display the remaining time that image detector will detect X-ray. More information, please refer to Detector Auto-Sensing.
[System Message Bar]	Displays the last system status message. Click the arrow to bring up the message log since the last system re-start. To clear the system status area, open the Message Log and close it again. More information, please refer to Chapter 7: General Information - System Message Bar.
[Inhibit Message Bar]	Appears when there is some condition that prevents an x-ray from being taken, such as ” No active associated to system” . Click the arrow to view a list of all errors and interlocks that are preventing the exposure. The items are removed from the list as they are corrected. More information, please refer to Chapter 7: General Information - Inhibit Message Bar.

Detector Auto-Sensing

XR118 is a standalone upgrade system to analog RAD system (target system). There is no modification or connection to the target system. The XR118 system provides detector an auto-sensing function to synchronize the exposure with target system. Detector auto-sensing function is able to detect X-ray rising edge and X-ray falling edge from standard clinical exposure and acquires image without timing synchronization with system generator.

Table 9-2 Auto-sensing Modes

Function	Description
Before Auto-sensing	When accessing into acquisition page, and system not ready for preparing auto-sensing because of inhibit, the system provides the corresponding “inhibit” warning message in inhibit message bar, the inhibit text tells the real reason why system or detector not ready for auto-sensing. **Note:** Make sure there is no exposure inhibit warning in message bar before clicking the [Prepare Auto-Sensing] button.
[Prepare Auto-sensing] 	After this button is clicked, the system initiates the auto-sensing process if there is no inhibit. If user clicks the [Prepare Exposure] button when there is already an active inhibit, a warning message will be showed in the system message bar.
[System is preparing] 	When system is preparing, there is an "Exposure Inhibit" icon on the popup window.

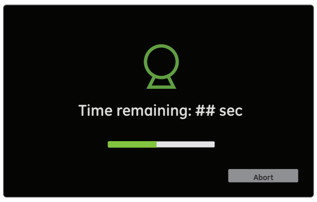
Function	Description
[Exposure Ready] 	The [Exposure Ready] icon shows when detector successfully enters auto-sensing mode. Once detector enters auto-sensing mode, there is an auto-sensing timer indicator on the popup window. This progress bar indicates the remaining time that image detector will detect X-ray. When the auto-sensing time only remains last 5 seconds, there will be urgent sounds alerting for user that the auto-sensing is about to end and user should take exposure within this 5 seconds. And the timer progress bar content will turn to red. An "Abort" button next to the progress bar is provided to allow user to cancel the auto-sensing.
X-ray Detection and Image Acquisition 	User should take exposure before detector auto-sensing time-out. Once system receives the x-ray, the timer stops and there is a popup window to indicate user of "X-ray detected, waiting for image". After the x-ray received, the system first sends the preview image and then the full image to system.

Table 9-3 Auto-sensing Exceptions

Function	Description
Auto-Sensing timeout 	If auto-sensing timeout, the [Exposure Ready] icon turns to red. Click the "OK" button to return to default acquisition page.
Auto-sensing Not Ready	If the detector auto-sensing not ready for exposure, the system informs user of the failure and failure reason in message bar. The warning message format is "Detector not ready for exposure because of ×××". **Note:** ××× is different according to failure reason. • Detector hardware error. • EMI • Image in detector not sent The system also provides audio indication to warn user.

Function	Description
Auto-Sensing Exception	• Detector communication loss - For the wireless communication loss, please refer to Lost Wireless Connectivity. • Thermal Issue - When system receives "detector panel temperature out of range" warning message, detector automatically exits auto-sensing mode. And there is also audio warning which will keep for maximally 10 minutes or until user confirms the popup dialog.

Starting a New Exam

This section describes the adjustments required when conducting a digital exam.

Refer to the instructions in Chapter 4: Quick Step Guide for an overview of the entire acquisition process.

Follow this process to conduct an exam using the Image Detector.

Note: If you need to interrupt the exam and resume it at a later time, press the Close button and select [SUSPEND] option. You will be returned to the Worklist.

1. If multiple procedures were selected from the Worklist, select the procedure from the exam drop-down list.
2. Select the Exam and View to perform from the protocol list.
3. Select the Patient Size. The system default is Medium Adult.

Note: To optimize processing for the best image quality, Patient Size should be confirmed for each view. Available options are:

- Small Pediatric
- Medium Pediatric
- Large Pediatric
- Small Adult
- Medium Adult
- Large Adult

Warning: It is critical to select the proper patient size on the Acquisition screen. The incorrect Patient Size may result in an unnecessarily large radiation dose or multiple exposures.

4. Add the Patient and Image Detector orientation using the drop-down menu.
5. Make technique adjustments at analog system as necessary: kV and mAs.
6. Position the Image Detector under the patient.
7. Confirm or adjust the Patient Side, if applicable.
8. Collimate and shield as appropriate for the exam.
9. Have the patient suspend respiration, if required.
10. Click the [Prepare Exposure] button to get ready to receive x-ray. More information about detector auto-sensing function, please refer to Detector Auto-Sensing.

Note: Make sure there is no exposure inhibit warning in message bar before clicking the [Prepare Exposure] button.

Note: User should take exposure on the analog system before the timer stops. If the detector is not in prepared mode, the exposure shall be prohibited. A re-click [prepare exposure] action is required to get ready for x-ray exposure again.

11. Make exposure at analog system after the system shows [Exposure Ready] with a timer.

- The image appears on the Image Viewer screen.

Note: It takes about 10 seconds for a fully processed image to appear on the Image Viewer screen. The Fast Preview image will appear in about 5seconds.

12. Click the [Exposure Techniques] button to input the actual exposure parameters in target analog system. More information about this, please refer to Image Acquisition Palette.

13. Select the protocols in the Acquisition tab to switch back to the Acquisition screen.

Resuming Suspended Exams

Suspended exams may be resumed at any time. The process of resuming a suspended exam is the same as starting a new exam.

1. Select the exams from the Worklist.
2. Click [RESUME EXAM].

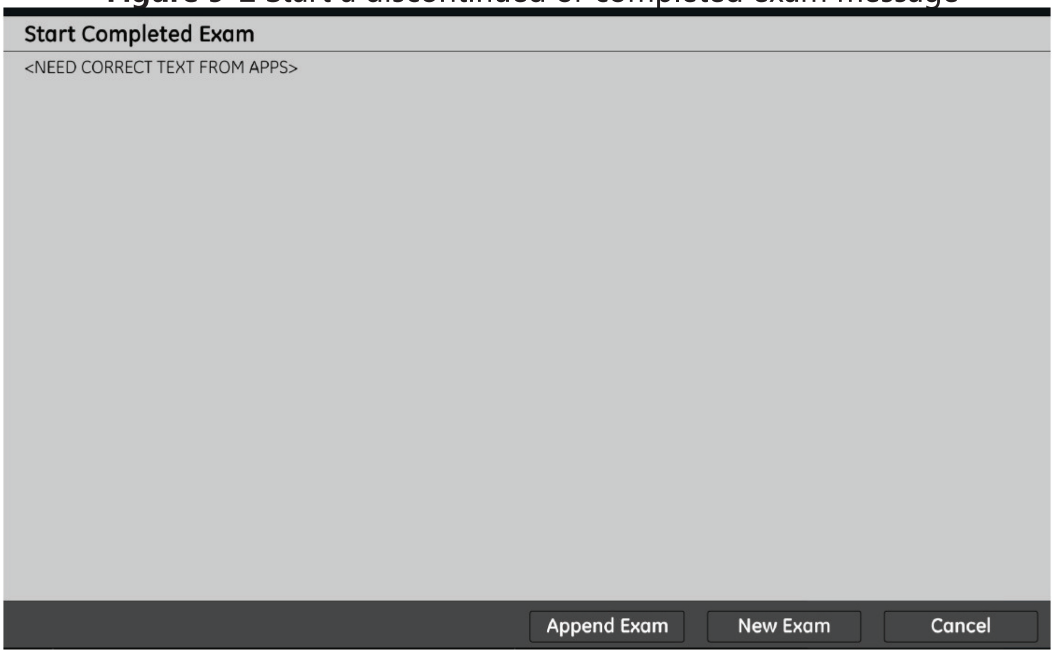
Note: Protocol selections and technique changes are not saved in a suspended exam. Protocols must be reselected and techniques must be re-set.

Re-starting Completed or Discontinued Exams

Procedures with a status of “Completed” or “Discontinued” cannot be re-opened. However, you may create a new exam or append the existing exam.

1. Select the procedure(s) from the Worklist.
2. Click [PATIENT INFORMATION] to verify the patient, if necessary.
3. Click [Next].
   - A message appears: “The selected exam has been Discontinued/ Completed and cannot be started/resumed. Would you like to create a new exam for this patient or append to the existing exam?”

Figure 9-2 Start a discontinued or completed exam message



4. Click the button of the action to perform.
   - [APPEND EXAM] creates a new series within the existing exam and opens the Select Protocols screen.
   - [NEW EXAM] creates a new exam and series for the patient and opens the Select Protocols screen.

Note: The new exam will be placed under the same accession number as a new series. Check your hospital conformance standards before selecting this option because it may effect HIS/RIS or PACS formats.

   - [CANCEL] closes the message and returns you to the Worklist.

5. Refer to Selecting or Changing Protocols to continue with the exam.

Selecting or Changing Protocols

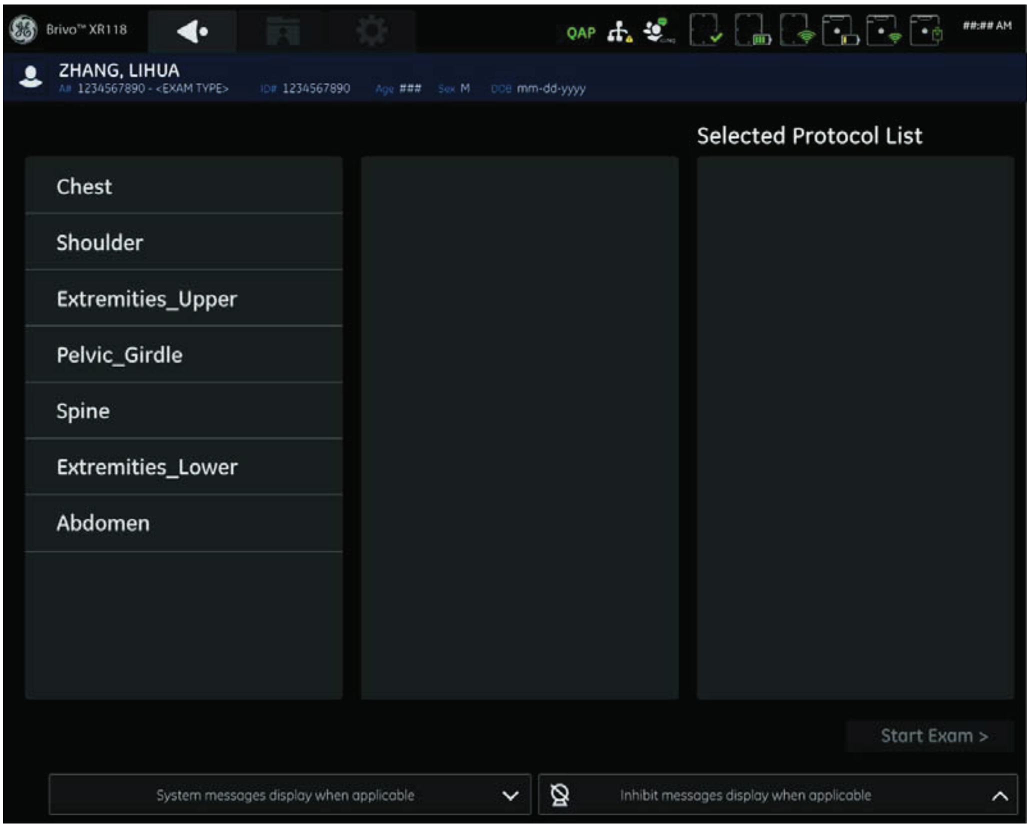
The Select Protocols screen (Figure 9-3) appears when you click [START EXAM] on the Worklist or Add Patient screen or when you click [SELECT PROTOCOLS] on the Acquisition screen.

The select protocols screen is divided into two halves: Available Protocols on the left and Selected Protocols on the right.

- Available Protocols lists all the protocols currently listed in the database, categorized by anatomical region: for example, head, chest, spine, and abdomen. Each category expands to show the exams for that category.
- Selected Protocols lists all currently selected protocols in the following format: anatomy / exam This list automatically updates as protocols are selected or removed.

Refer to Chapter 16: Set Preferences - Protocols for information on adding protocols to the protocol database.

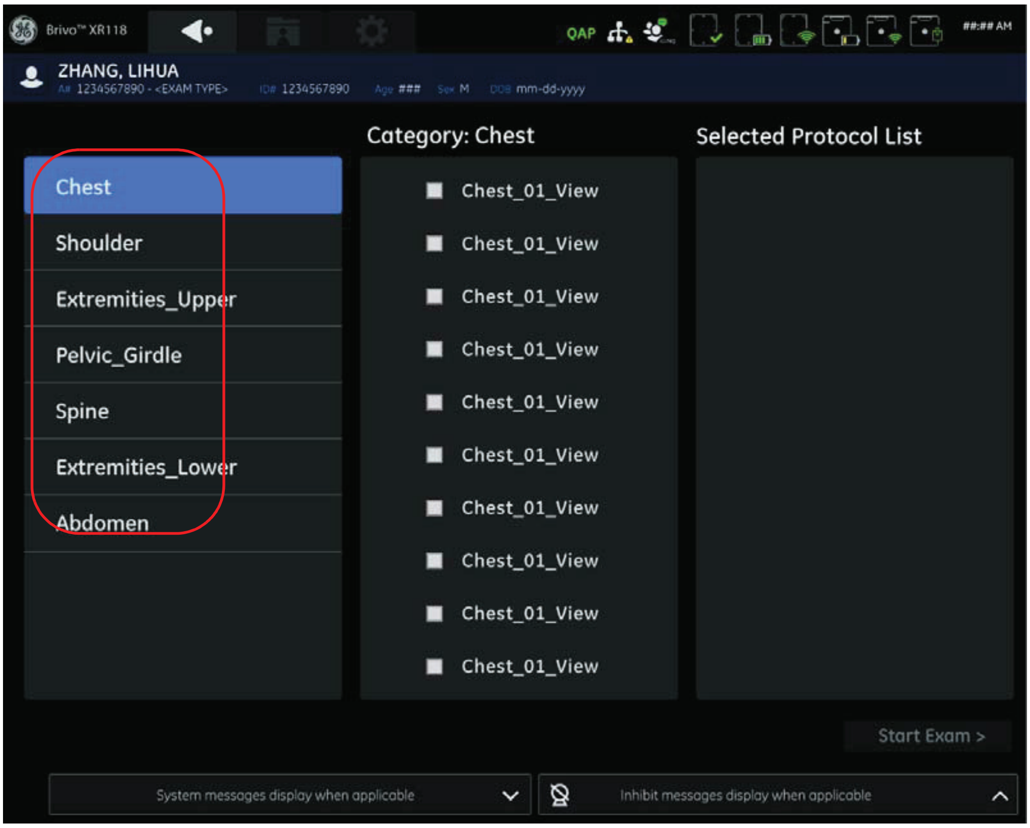
Figure 9-3 Select Protocols



Use this process to select or change protocols for a procedure.

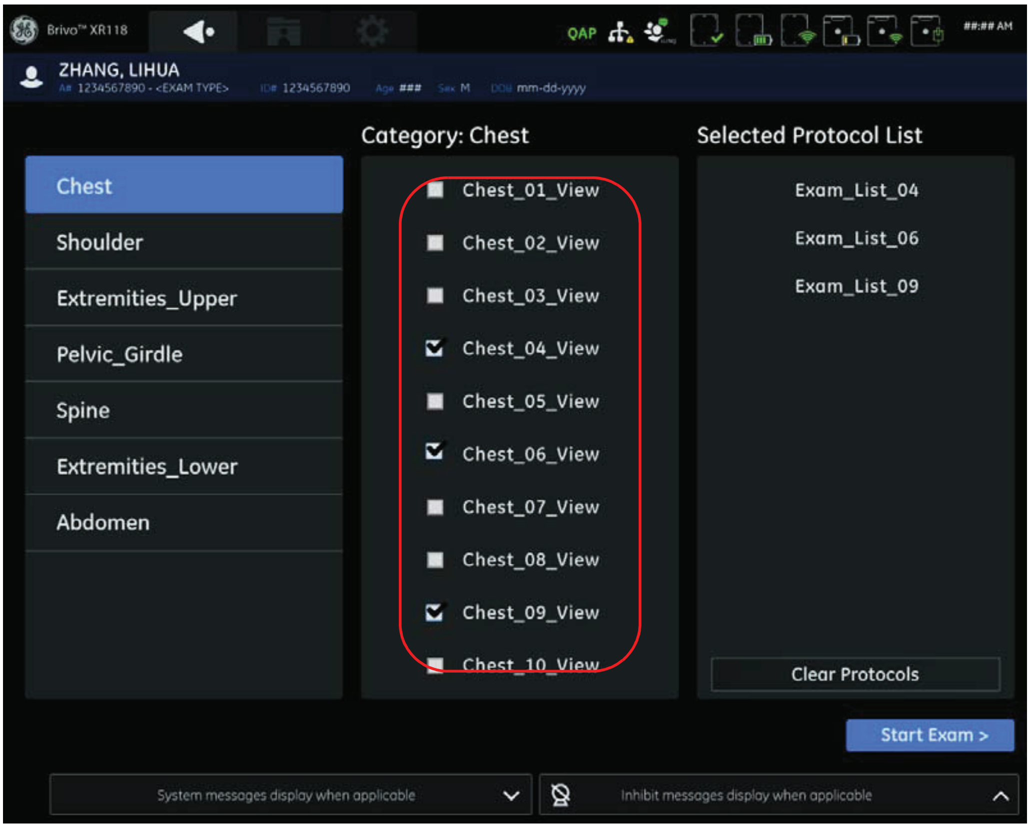
1. Select the desired protocol category, Chest for example.

Figure 9-4 Select Exam



2. The category lists all available exams. Click on an exam to select it.
   - A checkmark appears in the box to the left of the exam name.
   - A checkmark appears next to the category name. This indicates that the category has at least one exam selected.

Figure 9-5 Selected Exams



   - The category and exam names appear in the Selected Protocols list.
3. Click on the exam again to de-select it.
   - The category and exam name are removed from the Selected Protocols list.
4. Repeat process until exams are selected for all procedures.
5. Click [Start Exam].
   - The Select Protocols screen closes.
   - The Acquisition screen appears on the monitor.
   - Clicking [Clear Exams] removes the selections and returns you to the Worklist.
6. Start the exam by following the instructions in Chapter 4: Quick Step Guide.

Fast Preview

Fast Preview is a feature that automatically displays a preliminary image (Fast Preview Image) on the Image Viewer in less than 5 seconds when conducting a digital exam. The purpose of this Fast Preview Image is to aid the operator with patient positioning. With a good wireless link, a processed image will display in approximately 10 seconds.

- The Fast Preview Image is used solely to confirm patient positioning.
- The Fast Preview Image is not saved on the system after being displayed.
- The Fast Preview Image is not used to determine image quality.
- The Fast Preview Image is not used for diagnostic purposes.

If the Fast Preview Image is not available from the Digital Detector, a Raw Image will be displayed on the Image Viewer before the Processed image.

Lost Wireless Connectivity

If detector wireless communication lost during the exposure, the system pops up a wireless loss window to indicate user of the wireless loss, and displays exposure inhibit.

Adjust detector or patient position to improve wireless signal.

After detector communication re-established, the system indicates user of the re-establishment.

For how to recovery the image saved on the detector after the communication re-established, please refer to Image Recovery.

Image Recovery

WARNING:Image recovery is only for image acquisition mode. Once the exam is closed/suspended/discontinued, image cannot be recovered.

WARNING:Once the system is shutdown, the image will not be recovered from detector.

WARNING:Once the detector powered off for battery out or hardware failure, the image cannot be recovered.

Note: Adjust detector or patient position to improve wireless signal.

Table 9-4 Image Recovery

Wireless lost after	Image Recovery Process
[Prepare Auto-sensing] button is clicked and the screen shows "Preparing System".	The system UI will return to default acquisition state with the system inhibit message. After wireless reconnects successfully, click the [Prepare Auto-sensing] button again, to restart the auto-sensing process.

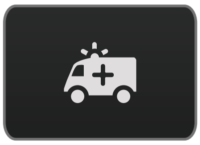
Wireless lost after	Image Recovery Process
The screen shows "Exposure Ready" icon with a timer. And the user takes an exposure.	There will be a popup message "Detector Wireless lost. If you have taken exposure, Adjust detector or patient position to improve wireless signal. Click ABORT to cancel Auto-sensing. WARNING – Image will be lost if exposure taken." A button "ABORT" is provided to give up waiting for wireless reconnection and this auto-sensing process. If clicked, there will be a warning that "Auto-sensing will be aborted. If exposure has been taken, then it may result in Image Loss. Do you want to continue?" **WARNING:Once user confirms to give up the auto-sensing process, the current auto-sensing process will be given up and the image (if any) will not be recovered.** After wireless reconnects successfully, the system shall inform user that "wireless reconnects successfully, please wait for system recovering". Then the system displays the waiting for image popup message.

Wireless lost after	Image Recovery Process
The screen shows “X-ray Detected. Waiting for Image”.	There will be a popup message “Image has not received from detector. Click RETRY to retry image transfer, Adjust detector or patient position to improve wireless signal. Click ABORT to cancel image transfer from detector. WARNING- Image will be lost.” A button “ABORT” is provided to give up waiting for wireless reconnection and this image transfer. **WARNING:** **Once user confirms to abort the image transfer, the image will not be recovered.** Abutton “Retry” is provided to continue return to "Wait for image" process. The fast preview image will not be recovered if wireless lost during fast preview image transfer but wireless loss notification and exposure inhibit shall be provided to user. After wireless reconnects successfully, the system UI shall turn to the wait for image process.
Wireless lost between H.H. and image workstation	The H.H. displays a network error page. If wireless loss happens during exam, there will be an audio warning to user for not to take exposure. After wireless reconnects successfully, the H.H. displays the current UI state described above when H.H. reconnects to image workstation.

Conducting an Emergency Exam

Emergency Exam is a function that allows a patient to be x-rayed without selecting the patient from the Worklist or adding the patient to the Worklist.

Figure 9-6 Emergency Exam



Emergency Exam is used in the following situations:

- Medical emergency – The patient needs an x-ray taken immediately.
- No patient information available – There is no patient information to enter due to the patient' s medical condition. For example, the patient was found unconscious with no identification.

When the [EMERGENCY EXAM] button is clicked, the system assigns a unique tracking number as the Patient Name. The tracking number is the word "NEW" followed by a date and time stamp of the second the Emergency Exam button was clicked. For example: NEW040622140345. The exam was initiated in year 04, month 06, day 22, hour 14, minute 03, and second 45.

The tracking number is used as the Patient Name on image annotation and as the Patient ID.

Note: When the patient information becomes available, images can be copied into the appropriate worklist selection. The selection can be populated to the worklist either by HIS/RIS or manual entry. Refer to Chapter 10: Image Management - Opening Exams and Images for more information.

Once initiated, an emergency exam is conducted the same way as any other exam.

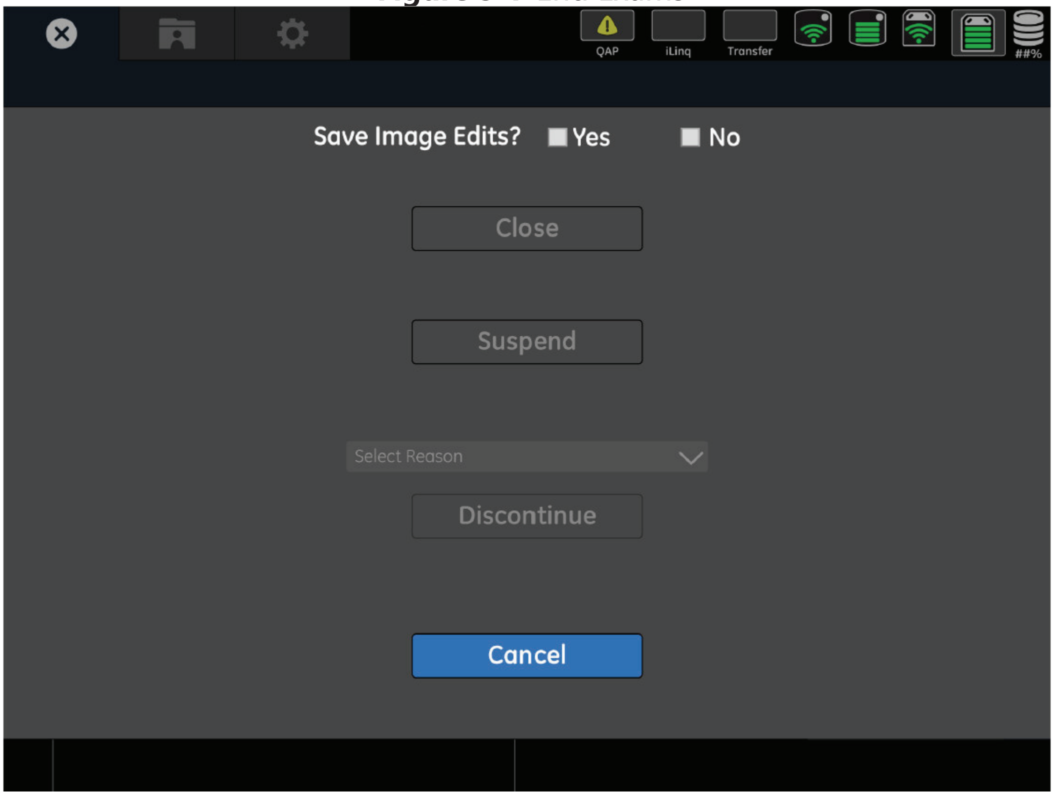
Follow this process to conduct an emergency exam.

1. Click [EMERGENCY EXAM] from the bottom left of the Worklist.
   - The Select Protocols screen appears. Refer to Selecting or Changing Protocols.
2. Select the protocols for the exam.
3. Click [Start Exam].
   - The Acquisition screen appears.
4. Select the protocol to perform from the Protocol List.
5. Acquire images.

Close Exam

There are several ways to end an exam: Suspend, Close, and Discontinue. Each method is used for a specific purpose and cover a variety of different situations.

Figure 9-7 End Exams



Suspend

Suspend is for situations when you must leave the exam but intend to resume it at a later time. Suspending an exam does not initiate auto send or auto print (if enabled). Images acquired from a suspended exam do not appear on the Image Management screen. Any acquired images are stored in a temporary database until they are committed to the permanent storage database upon closure of the exam.

Close

Close is used when the exam is complete; that is, you have acquired all images and do not intend to continue. If enabled, Close sends the images to PACS and initiates auto print and auto send. The images are committed to the permanent storage database and the exam appears on the Image Management screen.

Discontinue

Discontinue an exam when you have opened the procedure but cannot continue the exam. Any images that were acquired are marked so that they are not used by PACS.

When an exam is discontinued, you must provide the reason for discontinuing the exam. The system sends the status and reason together to the HIS/RIS.

The available reasons are:

- Doctor cancelled procedure
- Equipment failure
- Incorrect procedure ordered
- Patient allergic to media/contrast
- Patient died
- Patient refused to continue procedure
- Patient taken for treatment or surgery
- Patient did not arrive
- Patient pregnant
- Change of procedure for correct charging
- Duplicate order
- Nursing unit cancel
- Incorrect side ordered
- Discontinue for unspecified reason
- Incorrect worklist selection

Note: The reason for discontinuing an exam cannot be seen on the Worklist or Patient Information. The information is added to the DICOM header.

Use this procedure to discontinue an exam.

1. Click [Close] from the bottom of the Acquisition screen.
2. Select the option that best describes why the exam is being discontinued.
   - Choose "Discontinue for unspecified reason" if no other options describe the current situation.
3. Click [Stop].
   - The message closes and the Worklist screen opens.
   - The status of the procedure changes to "Discontinued" on the worklist.
   - If multiple procedures were selected, the discontinued status applies to all procedures that were open when the exam was discontinued.
   - Click [CANCEL] to close the message and return to the Acquisition screen.

Chapter 10
Image Management

The Image Management screen (Figure 10-1) shows all the images stored in the selected database source. This screen is used to manage images, copy images to exams, transfer images to network hosts, or save images on USB storage device.

Topics covered include:

Overview

The majority of the Image Management screen is devoted to the exam list. Images are organized by exam. Each exam is a row. If multiple exams were acquired in the same session, each exam has its own row on the list. The exam expands to show the series.

Within each exam are "series" of images. A series is a collection of one or more images acquired in a session. Each protocol is a series. A new series is created when a completed exam is appended and every time an image is re-processed (in review mode).

There are two types of image series: raw and processed. Raw images are the exact images that were acquired. Processed images are the raw images with specific processing and image adjustments (such as brightness and contrast) applied. It is possible to create several processed images from one raw image.

Individual images reside within the series. Clicking the [+] button opens the image details section of the worklist. In the Image Details section, each row is an image. Selecting a row makes a small preview image, or "thumbnail," appear. The image may be opened for viewing or adjustment or deleted.

Selecting multiple exams on the Image Management screen is different than on the Worklist.

- The Image Management screen allows you to select exams that do not have the same Patient ID or Patient Name.
- To select a contiguous group of exams: Hold down the SHIFT key on the keyboard. Click and drag with the mouse to select the exams.
- To select non-contiguous exams: Hold down the CTRL key on the keyboard. Click on individual exams to select.

Figure 10-1 Image Management

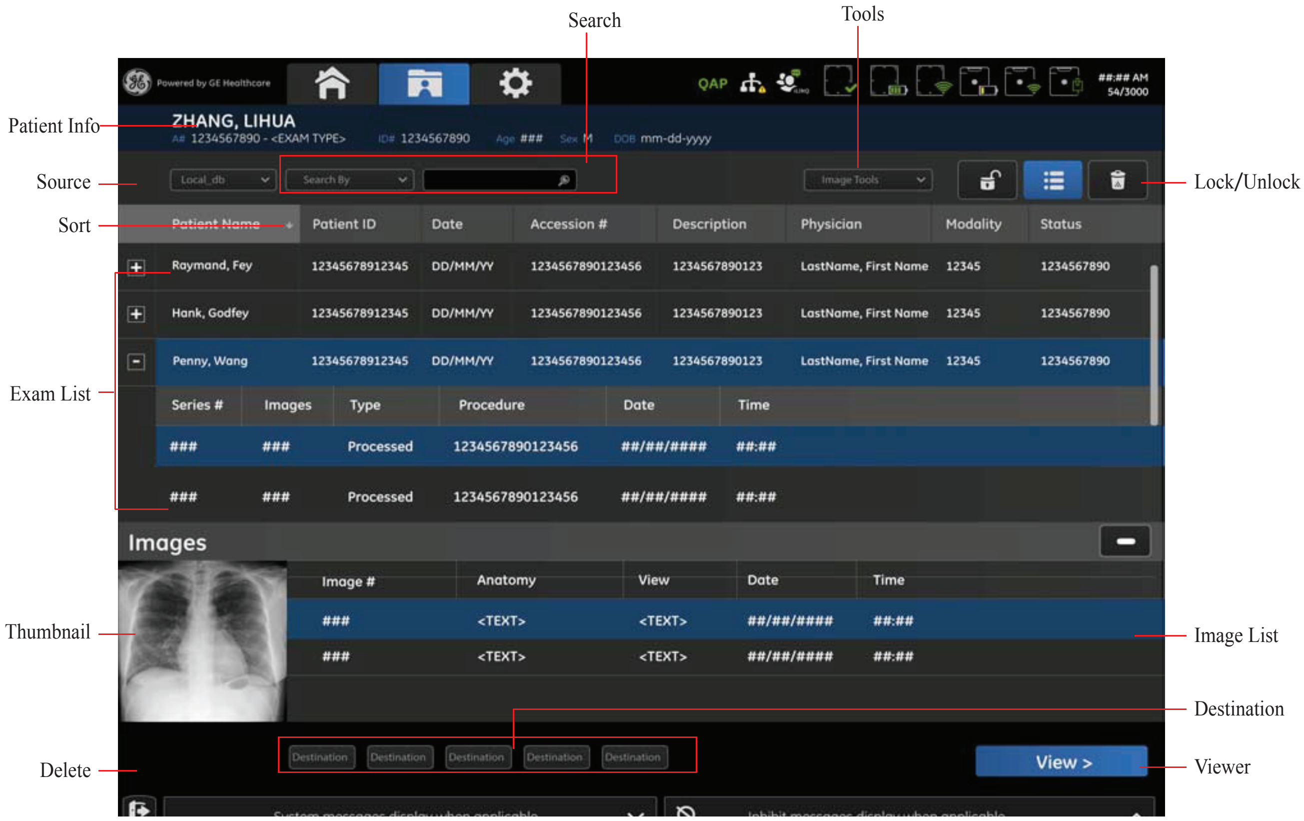
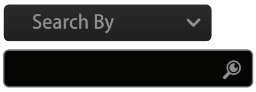
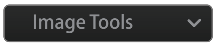
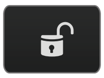
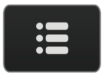
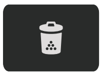


Table 10-1 IImage Management functions

Function	Description
[Patient Information] 	Shows the Patient Information screen for the selected procedure. **Note:** Patient Information cannot be edited once an exam has started. More information, please refer to Chapter 8: Worklist-Adding/Editing/Viewing Patient Information.
[Source] Local_db	Selects the source of images to view (e.g., the local workstation, or a CD/DVD drive). More information, please refer to Selecting Image Database Source.
[Sort by Column] Patient Name	For information about how to sort the column, please refer to Sorting by Column.

Function	Description
[Search By] 	Searches for procedures by the selected the column name in the drop-down list and the search criteria entered into the text box. Refer toSearching List.
[Image Tools] 	Performs various functions on selected exams. Available options are: • Copy Exam: Allows all exam images for a patient to be copied to another patient, to another location, or to USB drive. More information, refer to Copying Exams and Images. • De-identify: Makes the patient anonymous (removes all identifying information, including Name, ID, and accession number). Refer to Making Patient Anonymous (De-Identify). • SMPTE: Allows services personnel to access the SMPTE pattern for system calibration. • CBT: If available, launches Computer Based Training for the system. If Computer Based Training is not available, the option is disabled. • PACS Test Images: Loads a set of calibration images that are used to test the quality of images sent to PACS or printers. • TG18 Samples: Loads a set of test images that are used to calibrate the display monitor. **Note:** It is not expected that you will need to access the SMPTE pattern or test images during the course of a normal day. Test images are typically used to calibrate the system or to determine the cause of quality problems.
[Lock/Unlock] 	Locks the selected exams from deletion. If a locked exam is selected, the button name changes to [UNLOCK]. [UNLOCK] removes the lock from the selected exams.
[Multi-Select] 	Selecting the "Multi Select" button shall allow the selection of: - Multiple exams - Multiple series within the same exams - Multiple series across multiple exams - Combination of exams and series - Multiple image selections within the same series

Function	Description
[Exam, Series, and Image List]	Lists the images saved in the local database categorized by exams and series. The following information is displayed: - Exams: The exams saved in the local database. - Series detail: The series for the selected exam. - Image list: The images for the selected series. - Image preview: A representative thumbnail of the selected image.
[Delete] 	Deletes the selected exams or images from the local database.
[Destination]	Selects where images are to be copied or saved. Refer to Chapter 16: Set Preferences for more information about how to configure the different storage destination.
[View >]	Opens the Image Viewer screen and shows the images in the selected series. Images may be adjusted on the Image Viewer screen. Refer to Chapter 11: Image Viewer for more information. If Multiple Patient Print function is not activated, this icon will be unavailable when you select multiple patient images.

Selecting Image Database Source

The Source buttons allow you to load and work with images from different locations, such as a CD/DVD drive, network host, or the local workstation.

Figure 10-2 Image sources

- Local_DB: Shows exams and images stored on the local workstation.
- CD/DVD : Shows exams and images stored on the CD/DVD.
- Host : Shows exams and images stored on a network host.

Loading Images from a Network Host

Follow this process to access images stored on a network host.

1. Select the network host from the drop-down list, if necessary.
   - The filter screen appears. Refer to Chapter 8: Worklist for more information.
2. Complete the Filter screen as appropriate.
3. Click [OK].
   - A message appears: "Retrieving requested information."
   - The Image Management screen list updates with exams from the selected source.

Loading Images from a CD/DVD

Follow this process to access images stored on a disk.

1. Place the CD/DVD with images into the CD drive.
2. Click [CD]。
   - The exam list updates to show the images stored on the USB disk.
3. Select the exams.
4. Copy the exams to the Local database. Refer to Copying Exams and Images for more information.
5. Open the exams from the Local database.

Note: If the exams are being viewed on a computer that has the DICOM viewer installed, images may be viewed directly from the USB disk.

Searching List

The Search By feature finds exams by column.

Figure 10-3 Search by

1. Click the button on the Search By drop-down list to select the column you want to search.
   - If the column you want is already selected, begin at step 3.
2. Select the column. For example, Patient ID.
   - The list automatically sorts the selected column.
3. Type the search criteria into the text box. For example, you are looking for patients whose names begin with “J” , so you would type “J” into the text box.

Note: The text box is not case sensitive.

4. Continue typing the search criteria.
   - The list automatically selects the first exam that matches what you have typed into the text box. This is called an incremental search.
   - If no procedures match what you have typed, the list de-selects all procedures and places the closest match at the top of the list.

Sorting by Column

Sorting allows you to organize the procedures by the column of your choice.

1. Click on the column heading you want to sort, or choose the column in the Search By drop-down list. For example, you want to see all the procedures that have a status of "Suspended", so you click on the "Scheduled Status" column heading.
   - An arrow appears in the column heading to indicate which column is currently being sorted.
2. Click the column heading again to switch between ascending and descending order.
   - An up-pointing arrow indicates that the column is sorted in ascending order. That is, sorted in alphabetical order or numerical order from smallest to largest.
   - A down-pointing arrow indicates that the column is sorted in descending order. That is, sorted in reverse alphabetical order or numerical order from largest to smallest.

Figure 10-4 Column with descending sort

Opening Exams and Images

Follow this process to open exams and images for viewing.

1. Click [+] button next to exam to open it (or, select the exam and press ENTER on the keyboard).
   - The series for the exam expands below the exam.
2. Select the series and click [+] to expand image details.
   - The image detail opens.
3. Select the image.
   - A preview thumbnail appears.
4. Select the series and click [VIEW].
   - The selected series opens on the Image Viewer screen with the selected image displayed.

Copying Exams and Images

Exams (including all series and images) may be copied to a network host or to a CD/DVD drive. The images from an exam may be copied to another exam.

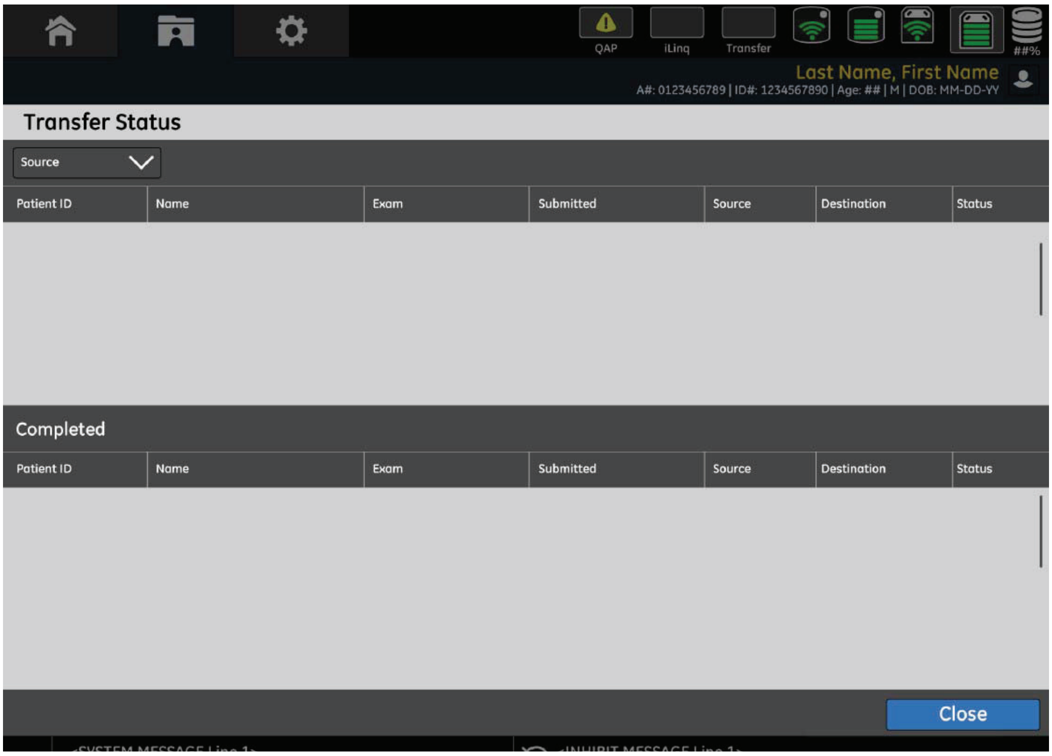
Note: Copying exams does not remove the exam from its original location.

Copying Exams to a Network Host

Exams may be copied to a configured network location. Refer to Chapter 16: Set Preferences - Network Connections for information about configuring network hosts.

1. Select the exams to be copied.
2. Click [DESTINATION].
   - A message appears: "Images will be copied to (host name). Select OK to confirm."
3. Click [OK].
   - If there is a problem and the exams cannot be copied to the selected network host, a message appears: "The network destination is not responding. If the problem persists contact your network administrator."
   - If the number of submitted jobs exceeds the max allowed number, a message shall appear: "Job Queue is Full. Delete failed jobs from the Transfer log."
   - Click [OK] to close the message. Try copying the exams at a later time.
   - To see the status of the exams being copied, click [TRANSFER] button at the top of the Image Management screen.
   - The Transfer Log screen appears.
   - Click [CLOSE] to close the screen and return to the Image Management screen.

Figure 10-5 Transfer Status



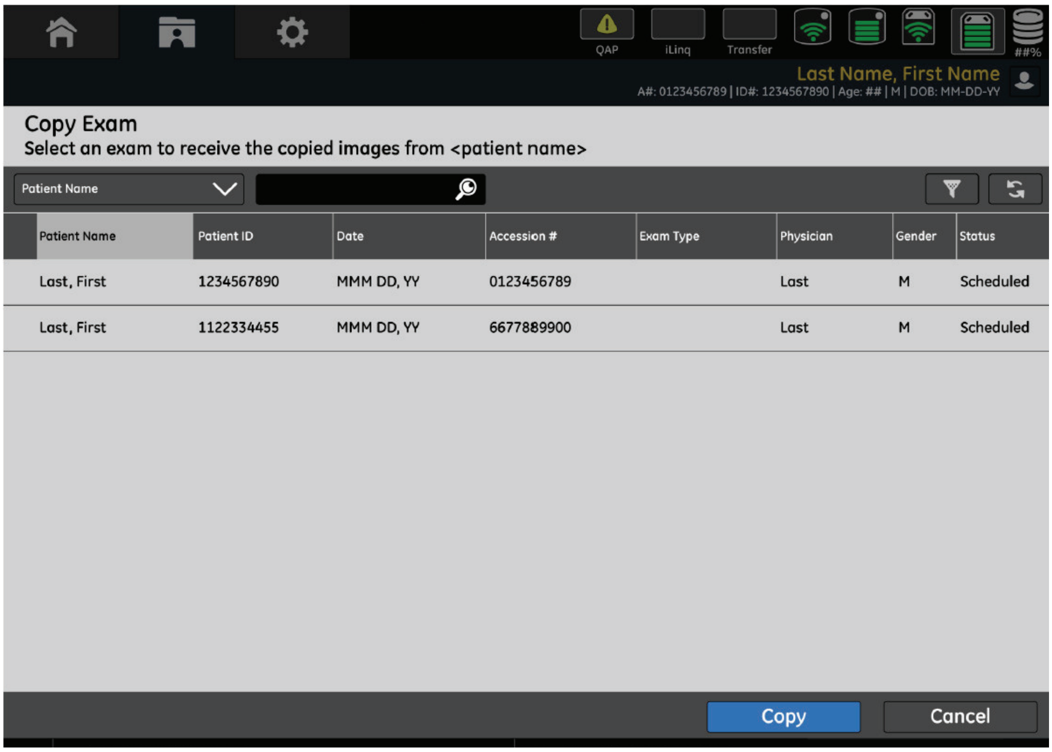
Copying Images to Another Exam

This process is used to copy images from one exam to another. Copying images is used to consolidate the images from multiple exams for a single patient or to reconcile patients to exams. For example, images taken for an emergency exam can be assigned to the patient's real name once the patient's information is known or if images were acquired for the wrong Worklist entry.

Note: You can only copy the images from one exam at a time.

1. If you are assigning an emergency exam to a patient, you may need to add the patient to the Worklist first.
   a) On the Worklist screen, click [ADD PATIENT] button.
   b) Enter the patient's information. Refer to Chapter 8: Worklist - Adding/Editing/Viewing Patient Information.
   c) Click [SAVE].
2. On the Image Management screen, select the exam to be copied.

3. Switch the [IMAGE TOOLS] button to “COPY EXAM” , if necessary.
    - The Copy Exam screen appears.



    - The Copy Exam screen shows all available exams for the current location and all Worklist entries with the status of “Scheduled” .
4. Search or Filter the exam list to locate the destination exam.
5. Select the exam where you want the images copied to.
6. Click [OK].
    - A message appears: “Images will be copied to the selected exam. ”
    - Images will not automatically be removed from the source exam.
    - The destination exam will be marked as "Completed".
7. Click [OK].
    - The message closes.
    - A message appears: “Retrieving information. Please wait.”
    - [CANCEL] stops the copy process, closes the message, and returns you to the Image Management screen.
    - All series and images are copied to the exam.

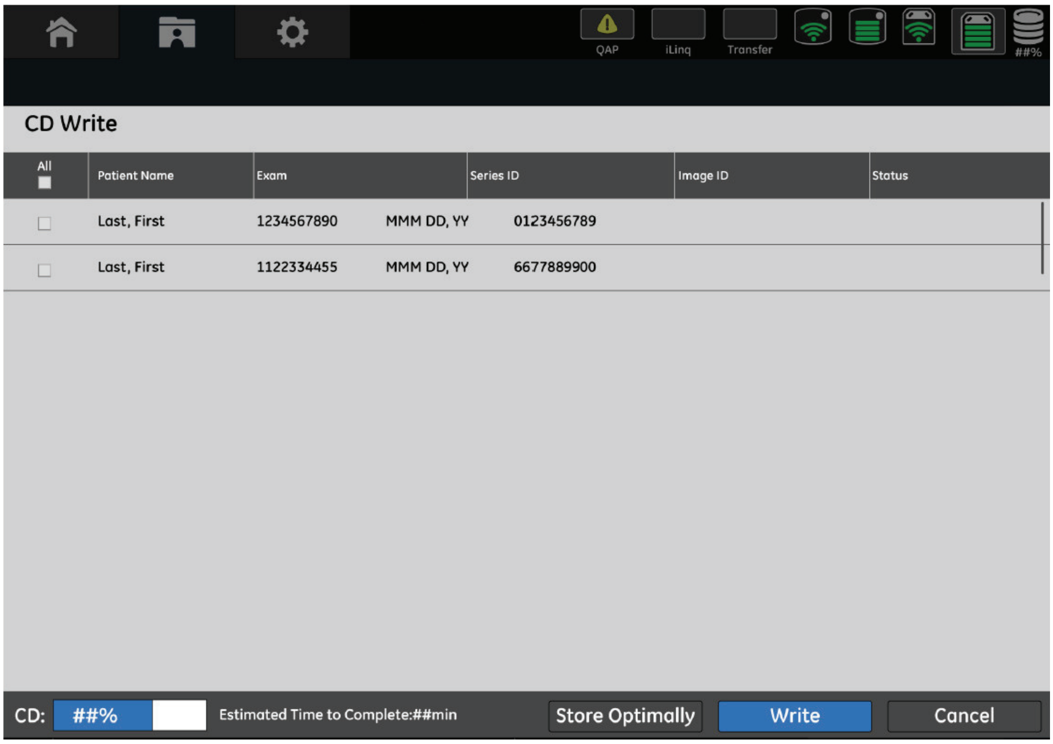
Copying Exams to a USB stick/CD/DVD drive

Exams may be copied to an USB stick or CD/DVD drive for archiving purposes, to send to a location that is not within the network, or to send with a patient’ s medical records.

Note: The disk used for copying images must be recordable. That is, the CD/DVD should be labeled “CD-R” (recordable) or “CD-RW” (re-writable). The DVD should be labeled “DVD-R” (recordable). The write-lock of USB stick should be open.

Note: You cannot copy exams to an USB stick or CD/DVD that already has exams saved on it. You will receive a “There is not enough room on the selected media.” error when you attempt to write to the media, even if there is enough space. Always use a new, blank storage media.

1. Insert a blank disk
2. Select the exams to be copied.
3. Press the Destination [CD1].
   - The CD Write screen appears.



   - [STORE OPTIMALLY] automatically checks if the selected images will fit on the CD. It will automatically un-check any items that cannot fit on the CD.
   - [WRITE] begins the copying process.
   - [CANCEL] closes the screen and returns you to the Image Management screen.

4. Confirm the exams to be copied. Un-check any exams that you do not want saved to the disk.
5. Click [WRITE].
    - The disk begins copying. The light on the front of the computer flashes yellow as the data is being written.
    - To see the status of the exams being copied, click [TRANSFER] button at the bottom of the Image Management screen.
    - The Transfer Log screen appears.
    - Press [CLOSE] to close the screen and return to the Image Management screen.

CAUTION: After the system finishes the disk, open the exams on the disk to ensure that the disk has the data written to it. Refer to Chapter 10: Image Management - Loading Images from a CD/DVD for more information.

6. Remove the disk.
7. Label the disk and store in a safe place.

Deleting Exams, Series, or Images

Exams, series, and images may be deleted from the selected database source from the Image Management screen.

Follow this process to delete exams, series, and images.

1. Select the Source, if necessary.

Note: Items cannot be deleted from a CD.

2. Unlock exams, if necessary.
    - Refer to Locking Exams from Deletion for more information.
3. Select the items to delete.
    - The items may be exams, series with an exam, or images within a series. Multiple items may be selected and deleted at once.
4. Click [DELETE].
    - A message appears: "Are you sure that you would like to delete the selected items?"
5. Click [OK].
    - The message closes.
    - The items are deleted from the Image Management screen.
    - Clicking [CANCEL] closes the message and the items remain on the Image Management screen.

Locking Exams from Deletion

The Image Management screen allows you to prevent, or "lock", exams from being deleted. The exam can only be deleted if the lock is removed, or "unlocked." The lock prevents exams from being deleted by other operators and from Auto Delete.

Locked exams can be copied, transferred, and viewed.

Only exams can be locked. Individual series or images cannot be locked.

Follow this process to lock and unlock exams.

1. Select the exams to lock.
2. Click [LOCK].
   - The lock icon appears in the status column of all selected exams.
   - The Lock button changes to Unlock.

Unlocking Exams

Follow this process to unlock exams so that they may be deleted.

1. Select the locked exams.
   - The Unlock button becomes active.
2. Click [UNLOCK].
   - The lock icon is removed from the status column of the selected exams.
   - The exams may now be deleted.

Making Patient Anonymous (De-Identify)

There may be times when you want the name of a patient to be kept confidential to maintain patient privacy. You can do this using the De-Identify feature. This feature allows you to create an anonymous set of images.

The patient examinations are copied and used to create a new patient, with the name "Anonymities patient" and a unique, randomly created Patient ID as shown in Figure 10-7.

Note: Once an anonymous exam is created, there is no way to recover the patient's identifying information.

De-Identify is a feature available from the Image Tools button (Figure 10-6).

Figure 10-6 Image Tools button

Figure 10-7 Anonymities patient

Use this process to make exam images anonymous:

1. Select the patients to make anonymous.
2. Switch the Image Tools button to [DE-IDENTIFY], if necessary.
   - A message appears: "The selected exams will be copied without patient identification. The originals will not be deleted."
3. Click [OK].
   - The Image Management screen updates with copied, anonymous exams.

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