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. Double-clicking on a series or 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.
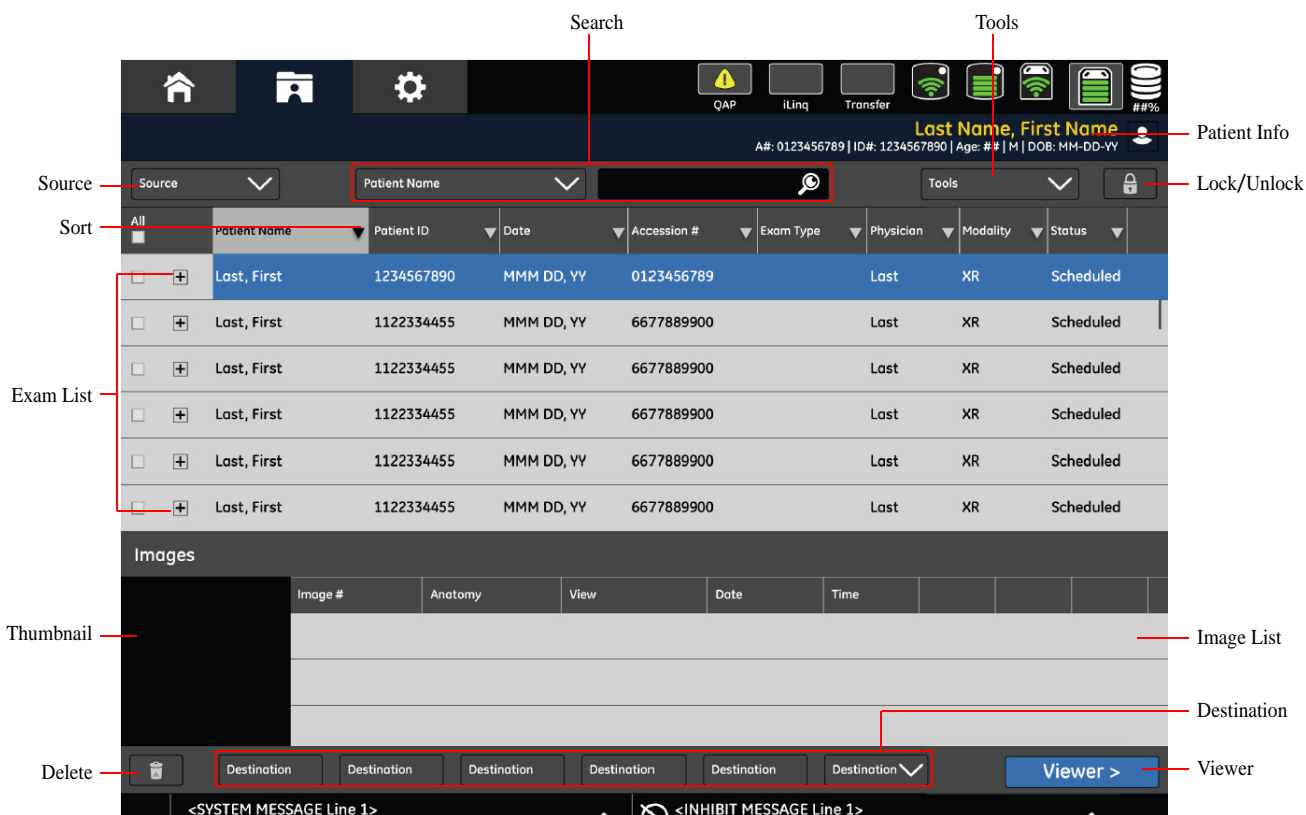
Figure 10-1 Image Management

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 Chatper 8: Worklist-Adding/Editing/Viewing Patient Information.
[Source]	Selects the source of images to view (e.g., the local workstation, or a USB drive). • 点击 [Local] 按钮显示系统中所有的检查。 • 点击 [USB] 按钮显示插入 USB 盘中所有的检查。 更多信息请参考 Selecting Image Database Source 小节。
[Sort by Column]	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 to Searching 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.
[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 Chatper 16: 设置参数 for more information about how to configure the different storage destination.

Function	Description
[Viewer]	Opens the Image Viewer screen and shows the images in the selected series. Images may be adjusted on the Image Viewer screen. Refer to Chatper 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 USB drive, network host, or the local workstation.

Figure 10-2 Image sources

- Local: Shows exams and images stored on the local workstation.
- USB：显示保存在 USB 存储盘上的检查和图像。
- 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 Chatper 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 an USB disk

Follow this process to access images stored on a USB disk.

1. 将有图像的 USB 存储器插入主机上的 USB 接口。
2. 点击 [USB]。
   - 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 procedures by column.

Figure 10-3 Search by

| Patient Name ⌄ | 🔍 |

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 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 10-4 Column with descending sort
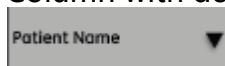
Opening Exams and Images

Follow this process to open exams and images for viewing.

1. Double-click the exam to open it (or, select the exam and press ENTER on the keyboard).

   ◆ The series for the exam expands below the exam.

2. Double-click the series to open it (or, select the series and click [+] image details).

   ◆ The image detail opens.

3. Select the image.

   ◆ A preview thumbnail appears.

4. Double-click on the image (or, select the series and click [VIEWER]).

   ◆ 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 USB 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 Chatper 16: 设置参数 - 网络连接 for information about configuring network hosts.

1. Select the exams to copy.

2. Click [DESTINATION].

   ◆ A message appears: "Images will be copied to the selected exam. Images will not automatically be removed from the source exam."

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."

   ◆ 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 LOG] 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

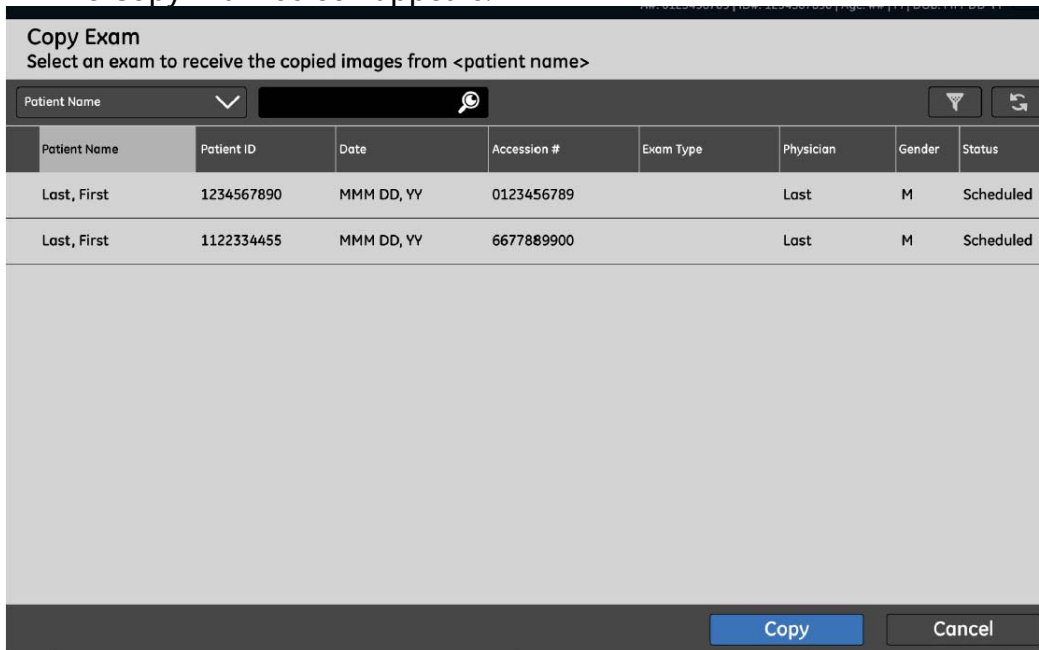
Copying Images to Another Exam

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].

    b) Enter the patient's information. Refer to Chatper 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."

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.

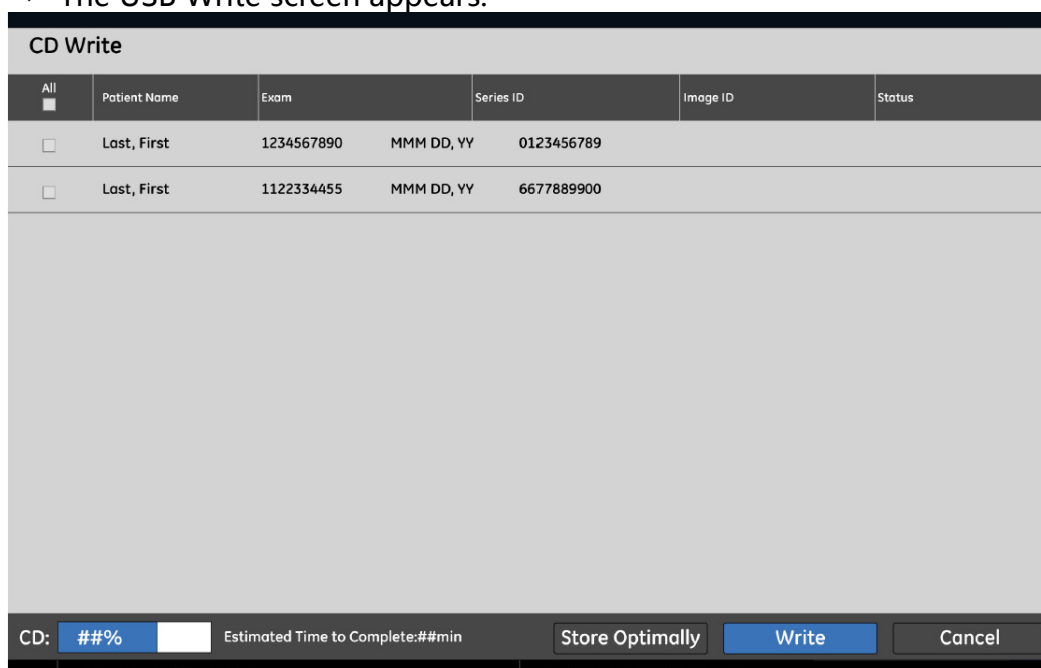   • All series and images are copied to the exam.

Copying Exams to a USB drive

Exams may be copied to a USB 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 "write" button should be ON.

Note: 您不能将检查复制到已保存有检查或其它信息的 USB 存储器上。否则，即使有足够的空间，您在写入时也会收 "USB 存储器非空白，请插入空白 USB 存储器再继续" 的错误信息。复制信息时，请总是使用空白 USB 存储器。You cannot copy exams to a CD/DVD that already has exams saved on it. You will receive a "Not enough space" error when you attempt to write to the CD, even if there is enough space. Always use a new, blank CD.

1. 将空白 USB 存储设备插入主机上的 USB 接口。

2. Select the exams to be copied.

3. Press the Destination [USB1].

   ◆ The USB Write screen appears.

All ☐	Patient Name	Exam		Series ID	Image ID	Status
☐	Last, First	1234567890	MMM DD, YY	0123456789		
☐	Last, First	1122334455	MMM DD, YY	6677889900		

CD: ##% ▭ Estimated Time to Complete:##min | Store Optimally | Write | Cancel

   ◆ [STORE OPTIMALLY] 按钮将决定复制哪一个检查可最大程度地利用磁盘空间。该按钮将自动取消选择任何不符合 USB 的检查。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 LOG] 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:在取出 USB 存储器前一定检查传输日志，如果在传输状态日志显示于传输日志界面下方前取出 USB 存储器，则此操作后，复制存储器中图片将失败，直到系统复位。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 9: Image Management-Load 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: 只能删除本地数据。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. 有关自动删除的信息，请参考 Chatper 16: 设置参数 - 图像管理小节。

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.

Chapter 11
Image Viewer

The Image Viewer screen (Figure 11-1) appears on the monitor once an exposure is taken in a live exam or when an image series is chosen from the Image Management screen for review. This screen is where images are adjusted and viewed. Topics covered include:

- Overview
- Image Selection Palette
- Image Acquisition Palette
- Image Tools Palette
  - Orientation
  - Annotation
  - Reprocess
- Dose Exposure Indicator (DEI)
  - DEI 不可用
  - 校正措施
  - 校正措施的例外
- Quality Check
- Quality Check
- Printing Images
  - 自动打印
  - 手动打印
- Sending Images
- Saving Changes to Images

Overview

The right side of the screen contains all the image selection and adjustment tools. Most of the tools are categorized into 4 "palettes" that can be expanded or collapsed to reveal or hide different functions.

The majority of the screen is devoted to image display. The images on the left side of the screen update as adjustments are made. You are able to view single or multiple images at once. When viewing multiple images, as shown in Figure 11-1, an aqua border identifies the currently selected image.

Table 11-1 describes the functions for the Image Viewer screen.

Figure 11-1 Image Viewer
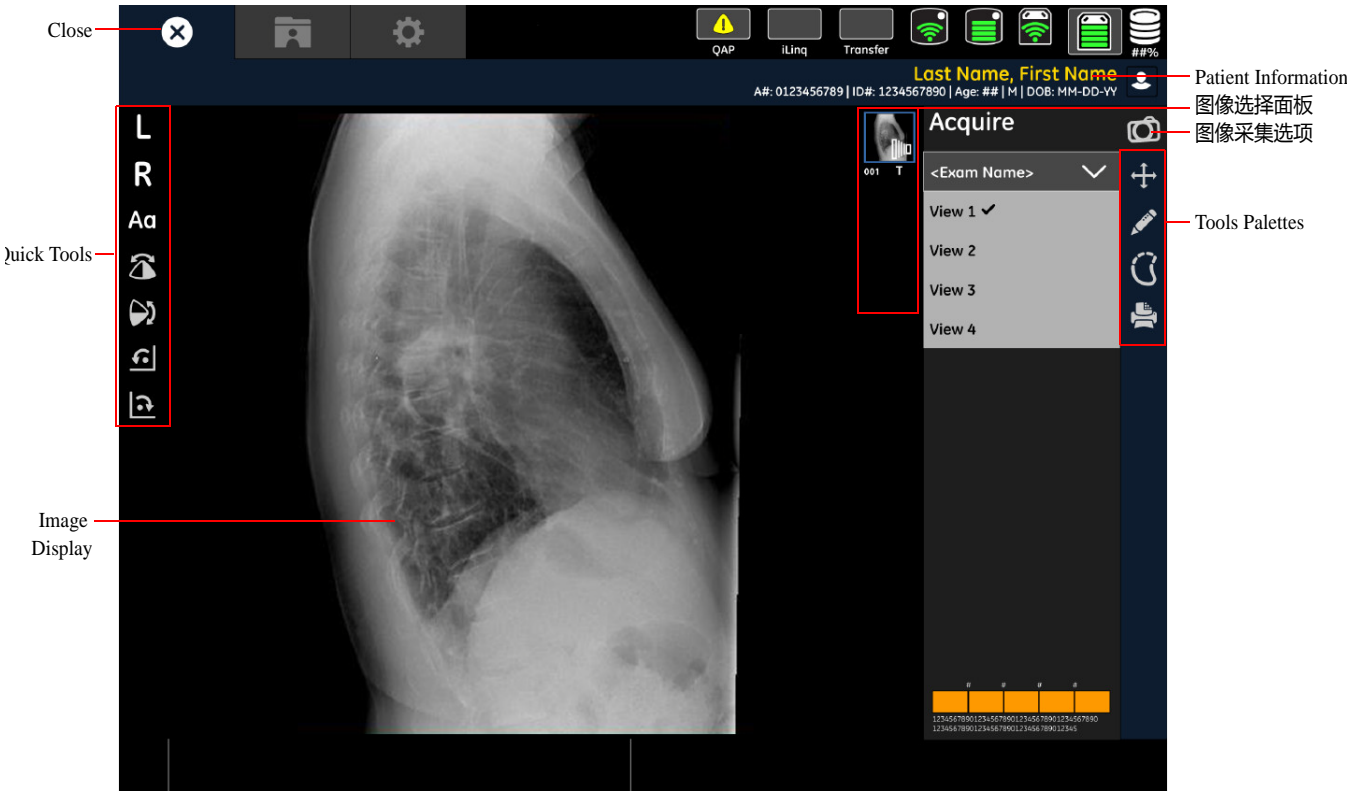
Table 11-1 Image Viewer functions

Function	Description
[Patient Identification]	Identifies the patient.
[Quick Tools]	Includes common used image processing buttons. The menus vary with different selected tool palette.
[Image Display Zone]	Shows the selected image in display zone.
[Image Selection Palette]	Image Selection Palette that shows small previews of all images in the selected series and highlights the images currently shown in the viewer. Refer to Image Selection Palette for more information.
[Image Acquisition Palette]	If in an active exam, allows you to switch back to the Acquisition screen. If viewing images from a completed exam, the Acquisition screen tab is disabled. ⚠️ **Warning:** **When acquiring multiple images or if you need to retake an image, you must switch back to the Acquisition screen in order to record the exposure. Making an exposure while the Viewer screen is displayed will expose the patient to radiation, but the detector will not acquire the image.**
[Tools Palettes]	Image Tools Palettes for image editing. • Orientation, refer to Orientation. • Annotation, refer to Annotation. • Image reprocess, refer to Reprocess. • Print, refer to Printing Images.
[Close]	Closes the Image Viewer screen and prompts you to save any changes to images. Close also initiates auto print and auto push, if enabled. Refer to Saving Changes to Images for more information.

Image Selection Palette

Image Selection Palette allows you to select which exam or series of images to view and display format.

The Images panel shows previews of all images in the selected series. The panel shows up to 8 image previews at a time. If there are more than 8 images in the series, a scrollbar appears on the right to allow you to see the rest of the images.

The image that is currently selected in the Image Viewer is shown with an orange border in the Images panel.

To view an image, click an image preview.

Image Acquisition Palette

图像采集选项板允许继续进行未曝光的检查。点击未执行的检查条目后将进入曝光采集界面，更多信息请参考 Chatper 9: Image Acquisition。
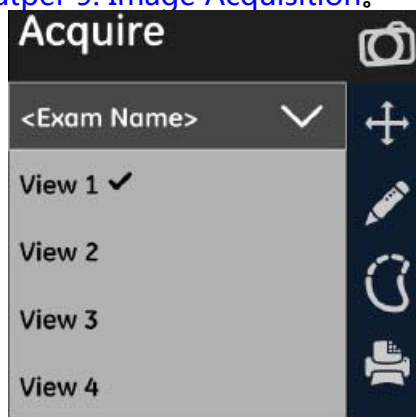
Note: 如果浏览已完成检查中的图像，则采集界面标签不可用。

Image Tools Palette

Different tools and controls are accessed through the Tool Selection list.

Image Acquisition Palette

Image Orientation Palette

Image Annotation Palette

Image Reprocess Palette

Image Print Palette
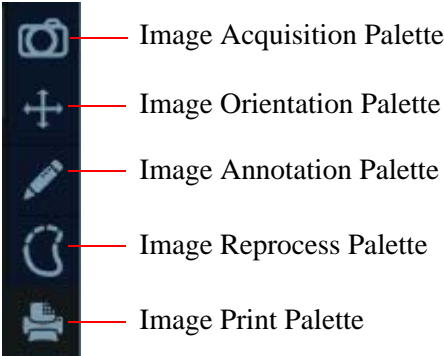
Orientation

图像显示工具（Figure 11-2）。该工具栏包含缩放、旋转和翻转等功能。

Figure 11-2 图像显示工具板

手动快门

向左旋转 — 向右旋转

垂直翻转 — 水平翻转

自由旋转

全景图像 — 放大镜

患者方位

显示区域

Table 11-2 图像显示工具板的操作说明

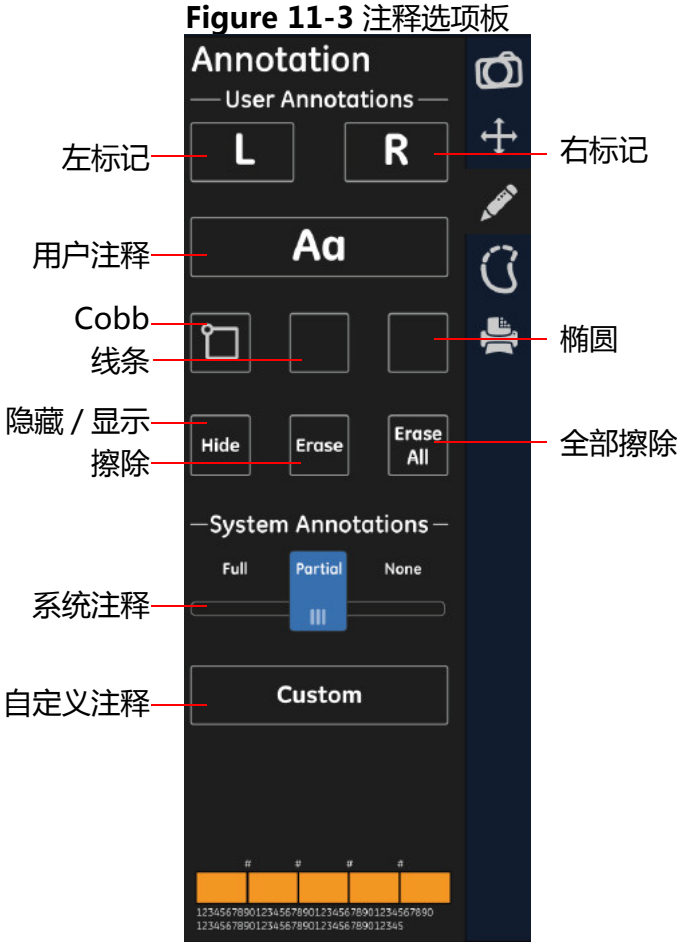| 工具	描述
[Manual Shutter]	Applies shutters manually to crop the image. In image review mode the image must be reprocessed to enable shutter icon. **Note:** This function is only available when the image is open in a live exam. 只有当图像在活动检查中处于打开状态或用于重新处理时，此项功能才可用。 Refer to 添加图像注释 for more information.
[Rotate Left]	Rotates the selected image counter-clockwise in 90 degree increments.
[Rotate Right]	Rotates the selected image clockwise in 90 degree increments.
[Vertical Flip]	Flips the selected image 180 degrees on the horizontal axis; that is, switches top for bottom.
[Horizontal Flip]	Flips the selected image 180 degrees on the vertical axis; that is, switches left for right.
[Free Rotation]	Rotates the selected image both clockwise and counter-clockwise. • Click the end buttons to rotate the image in 0.1 degree increments. • Click and drag the slider to spin the image. • Move the slider right to rotate the image clockwise. • Move the slider left to rotate the image counter-clockwise.
[全景图像]	在浏览区域内移动图像。
[图像放大镜]	放大三倍显示一小部分图像。
[患者方位]	
[1/2 Display]	Reduces the image to 50% (four pixels on the detector equals one pixel on screen).
[1:1 Display]	Shows default the image size where one pixel on the detector equals one pixel on the screen.
[Fit To Screen]	Scales the image to fit within the Image Viewer screen.
[True Size]	Shows the image in the exact size it was acquired from the detector (one centimeter on the detector equals one centimeter on screen).

Annotation

The Annotation panel (Figure 11-3) contains the tools to annotate images. Table 11-3 describes the tools and their functions.

Image annotations are divided into two categories:

- System annotation – Information that is kept by the system, such as identifying information, exposure and acquisition information, and processing information. These annotations are displayed as text at the corners of the image. You may select which annotations appear, but you cannot control where the annotations are placed.

- User annotation – Lines, ellipses, Cobb angle, user annotation (notes), and RL markers added by the operator to measure or bring attention to a section of the image. You draw or place these annotations on the image as appropriate.

Figure 11-3 注释选项板

左标记 — L · R — 右标记

用户注释 — Aa

Cobb — 椭圆
线条

隐藏／显示 — Hide · Erase · Erase All — 全部擦除
擦除

系统注释 — Full · Partial · None
自定义注释 — Custom

Table 11-3 Annotation Palette

Tools	Description
User Annotations	
[L/R]	Select the Right or Left marker. Tap the R marker or the L marker then tap on the image where it is to be placed. Note: Only one RL marker is inserted per image. 在图像上放置一个右或左标记，以作参考。 **Note:** 只有当图像在活动检查中处于打开状态或用于重新处理时，L/R 标记器才可用。 更多信息请参考添加图像注释小节。
[Aa]	Places a text box on the image that you may add notes into. **Note:** Annotations shall be placed within the image field of view.
[Cobb]	Places a Cobb angle (two lines) on the image that you may re-size, move, or angle. Cobb angle specifications are shown in the User Measurements annotation at the bottom right corner of the viewer.
[Line]	Places a line on the image that you may re-size, move, or angle. Line specif ications are shown in the User Measurements annotation at the bottom right corner of the viewer.
[Ellipse]	Places an ellipse (circle or oval) on the image that you may re-size, move, or re-shape. Ellipse specifications are shown in the User Measurements annotation at the bottom right corner of the viewer.
[Hide/Show]	Temporarily removes image annotations from the image. Click [SHOW] to see the annotations.
[Erase]	Deletes the selected image annotation. Deleted annotations cannot be recovered.
[Erase All]	Deletes all image annotations. Deleted annotations cannot be recovered.
System Annotations	

Tools	Description
[Full]	Places all available system annotation on the image. • Patient information – (top left corner) exam date and patient identification • Study information – (top left corner) exam identification • Series information – (top left corner) series identification • Image information – (top left corner) image identification • Acquisition information – (top right corner) dose and DAP • Hospital information – (top right corner) the name of the facility where the image was acquired • X-ray parameters – (top right corner) the mA, kVp, ms, and mAs of the exposure • Anatomy information – (bottom left corner) the protocol used to acquire the image • Processing information – (bottom left corner) the look used to process the image • User measurements – (bottom right corner) size and angle measurements for line, ellipse, and Cobb annotations • Display parameters – (bottom right corner) the size of the image and the zoom
[partial]	Displays ONLY the facility name, dose information and technical factors.
[None]	Removes all system annotations from the image. System annotations can be re-applied by clicking [FULL], [PARTIAL], or [CUSTOM].
[Custom]	Brings up a screen that allows you to choose which system annotations appear. More information, please refer to 自定义系统注释 .

自定义系统注释

按照下列步骤自定义显示在图像上的系统注释。

1. 点击 [自定义] 按钮 -> 弹出用户选择界面

2. 选择（检查）您欲显示的注释。

3. 如需要，调整字体大小。
    - 可用的字体有：
        - -3（最小号）
        - -2
        - -1
        - N（正常）
        - +1
        - +2
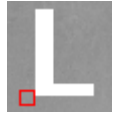   - +3（最大号）

4. 点击 [OK]（确定）。
    - 取消按钮用于关闭该界面并且不改变的选择。
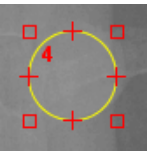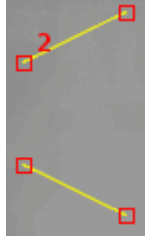
添加图像注释

Note:　所有图像注释显示在同一个位置（图像中间）并且具有相同的形状，大小和 / 或角度。可能在相互堆积相同种类的多个注释。

按照下列步骤添加图像注释。

1. 如需要，选择要注释的图像。

2. 点击注释按钮，插入注释。

3. 如 Table 11-4 所示，移动、重新调整大小或者改变注释的角度。

Table 11-4 图像注释说明

注释	说明
线条 	选择线条。 • 移动：点击并拖动中间的线条。 • 改变角度：点击并拖动线条末端其中的一个直角柄。 • 调整大小：点击并拖动线条末端其中的一个直角柄。
椭圆形 	选择椭圆形。 • 移动：沿边缘，点击并拖动椭圆（不是沿直角柄或十字柄）。 • 改变形状或改变大小：点击并拖动直角柄。 • 旋转：点击并拖动十字柄。
Cobb 	选择 Cobb。 • 移动：点击并拖动线的中间。 • 改变角度：点击并拖动线条末端的一个直角柄。 • 调整大小：点击并拖动线条末端的一个直角柄。
用户注释 	从图像工具栏中选择用户注释。 点击 [文本注释] 界面中的自定义文本区。 输入您的评注。 点击确定。 • 移动：点击和拖动用文本框左上角的红色方框。 • 编辑：双击用户注释。确保所作的改变已出现在 " 文本注释 " 界面上。
RL 标记器 	选择 RL 标记器。 • 移动：选择标记器并且拖到所需区域。 • R 和 L 之间进行切换：点击 [RL] 按钮。 **Note:** 一幅图像只能插入一个标记器。
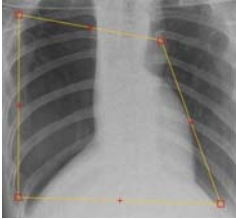
注释	说明
手动快门	选择手动快门 点击并拖动红色柄的角到所需形状大小。 点击手动快门应用。 再次点击手动快门移除。

Figure 11-4 图像注释示例
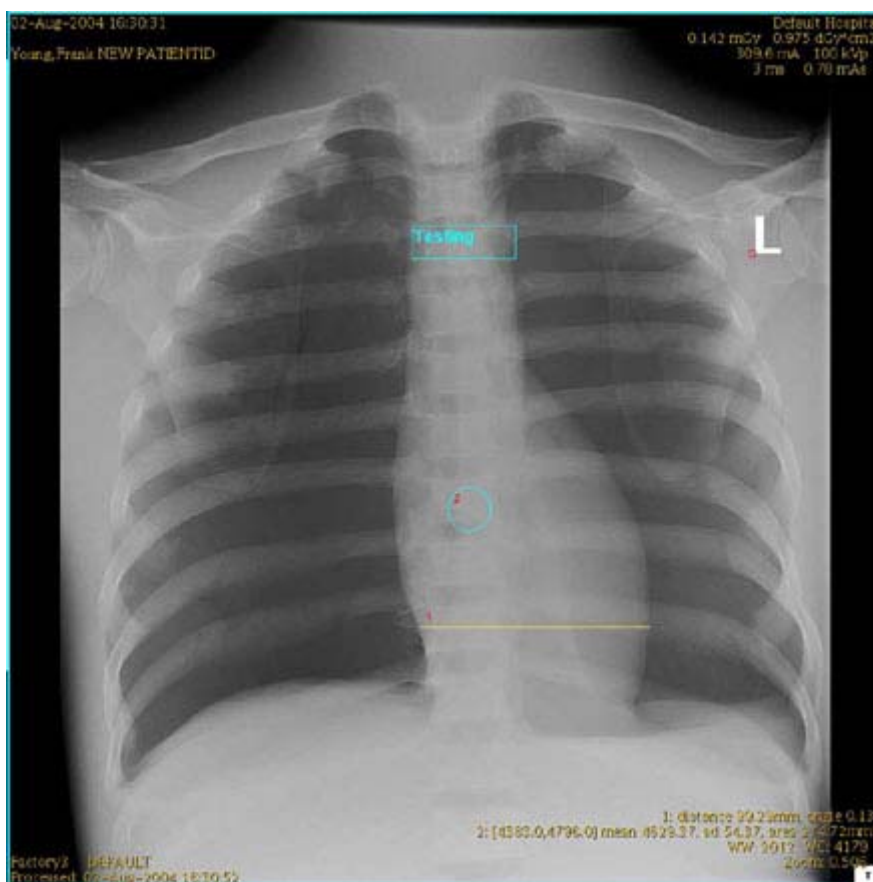
黄色＝已选注释

浅绿色＝未选注释

删除图像注释

按照如下步骤删除图像注释。

Note: 不可以恢复已经删除的注释。

1. 选择注释。

2. 点击擦除或者全部擦除。

   ◆ 如果点击了全部擦除，则会显示一条消息：" 您确实要删除所选图像的所有注释
     吗？"

3. 点击是。

   ◆ 将会删除所有注释。

Reprocess

Image re-processing allows you to extract more information from an already acquired image by changing the processing settings instead of taking additional exposures.

Re-processing can be performed on any image that has a corresponding raw data set. Images can be reprocessed both in live exams and in review mode.

When in an active exam, re-processing will create a new "PROCESSED" series. When in review mode, re-processing will create a new image in the series.

Note: When closing an exam or closing patient in review mode, the you must select to save changes to images, or the re-processed images will not remain in the series. More information, please refer to Saving Changes to Images.

The initial image processing is determined by the default that is configured for the protocol. More information, please refer to 设置参数 - 图像管理 .

Figure 11-5 Image Re-Processing palette

Table 11-5 Reprocess Palette

Tool	Description
快捷工具栏	
[预览工具]	显示处理后的图像，实时查看处理结果。
[比较工具]	
[Apply Button]	Applies the changes and re-processes the image. **Note:** When in an active exam, re-processing will create a new "PROCESSED" series. When in review mode, re-processing will create a new image in the series.
[保存按钮]	保存对图像所做的处理结果。
Image Reprocess	
[Brightness]	Lightens or darkens the selected image. • Move the slider right for a lighter image. • Move the slider left for a darker image.
[Contrast]	Adjusts the differences between dark and light on the selected image. • Move the slider right for more contrast (towards pure black and white). • Move the slider left for less contrast (towards uniform gray).
[Invert]	Reverses light and dark areas of the selected image.
More Functions	
[Windowing]	Applies windowing to the selected image. Available options are: • Normal – image as acquired • Hard – adjusts the image towards black and white • Soft – adjusts the image towards gray
[Anatomy]	Changes the anatomical region.
[View]	Changes the view.
[Image Type]	Changes the image type. Available options are: • Standard
[Patient Size]	Changes the patient size.

Tool	Description
[Look]	Changes the processing look. Looks are the way an image is processed to be viewed by a radiologist for interpretation. Looks are pre-defined combinations of brightness, contrast, edge enhancement, and tissue equalization. Factory Look descriptions: • Factory Look 1 – similar to analog film, low edge, no TE • Factory Look 2 – low CR look, low edge, moderate tissue contrast • Factory Look 3 – moderate CR look, low edge, TE • Factory Look 4 – highly digital look, high edge, high TE • Custom looks – The system allows the user to build up to 5 custom looks in any combination of parameters. 更多关于创建自定义外观的信息，请参考第 13 章：设置参数 - 图像处理。

Dose Exposure Indicator (DEI)

剂量曝光指数（DEI）为用户提供了一个可视的指示器，用以显示探测器接收到的给定图像的曝光数量。DEI 用作使用户可以在发生重摄时改变采集参数获得正确曝光图像的工具。DEI 估计到达探测器的剂量并将其与解剖的预期剂量作比较，从而说明图像是否曝光不足或过度曝光。

在胶片暗盒内，曝光直接与结果图像相关；曝光不足或者过度曝光的胶片太亮或者太暗。使用 DR 探测器，动态范围探测运算法补偿曝光误差，以创建亮度和对比度均可以接受的图像。因为在实际曝光和图像质量之间没有显著的关系，所以 DEI 识别并跟踪曝光不足和过度曝光。

DEI 的可接受范围随解剖结构而变化。例如，一次胸腔 PA 曝光可以使 DEI 为 0.6，而一次手掌曝光可以使 DEI 为 1.0。通过参数设置界面可以为每个解剖视图调整 DEI 的上限和下限。

Figure 11-6 DEI 的可视范围显示
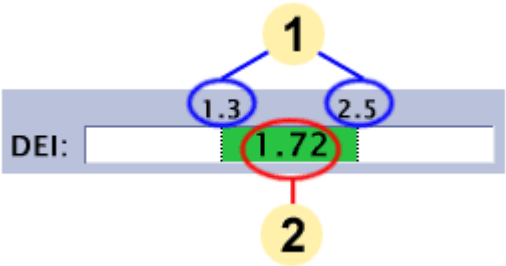
1. 可接受的 DEI 范围（上限或者下限）
2. 当前所选图像的 DEI

Figure 11-7 数字 DEI 显示示例

Figure 11-8 可视范围的 DEI 显示示例
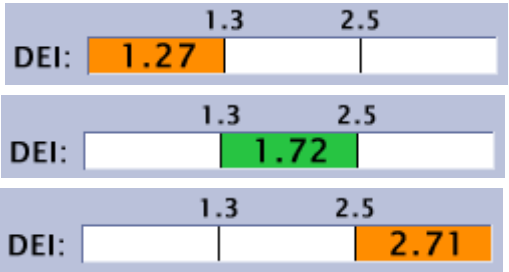
低 DEI= 图像曝光不足

可接受的 DEI= 图像正确曝光

高 DEI= 图像过度曝光

本系统为采集的每幅图像提供了 3 个估计值：

- 未补偿探测器曝光（UDExp）：在患者解剖后，用假定 80kV 并且不含反分散光栅的技术估计的探测器曝光（μGy）。此信息被保存在 DICOM 标题里。
- 补偿的探测器曝光（CDExp）：在患者解剖后，用实际的 kV 和反分散光栅估计的探测器曝光（μGy）。此信息被保存在 DICOM 标题里。

- 探测器曝光指数 （DEI）：探测器曝光的相对测量，作为对特定解剖视图的预期曝光的对比。这是浏览器显示屏上的可视指示器。

DEI 补偿系统的速度设置。例如：如果获取一个速度设置为 400 的物体的曝光，并且结果 DEI 为 1.72，那么在将速度设置为 200 后，相同物体的曝光（假定完全一样的技术和定位）得出的 DEI 为 1.72。

Note: 较高的 DEI 表示对探测器较高的曝光。当曝光增加时，不应该与减少的系统 "速度" 混淆。

默认的 DEI 下限和上限被提供用作初步指南。这些指南不应该作为重摄 / 再曝光的严格条件。DEI 读数是帮助技术专家决定图像是否需要再次采集的参考指南，指示器可以帮助用户决定适当的技术调整从而为探测器提供充足的曝光。

为了便于您使用，具体的限制和重摄规则应由适当的人员最终确定。

DEI 不可用

以下情况下 DEI 将显示 "N/A" （不可用）。

- "图像管理" 界面打开了完整的检查。
- 重新处理的图像。

校正措施

如果 DEI 指示器不在可接受的范围之内而且图像质量很差，请按照下列步骤去做：

- 低 DEI - 增加 mAs 和 kV 值。
- 高 DEI - 减少 mAs 和 kV 值。

如果 DEI 指示器在可接收的范围之内而且图像质量依旧很差，则可能需要通过外观自定义来调整图像。更多信息，请参考 Reprocess 和第 13 章：设置参数 - 图像处理。

Note: 如果系统继续显示低或高 DEI，请联系售后服务工程师。如果错误反复出现，则表明系统需要校准或维修。

校正措施的例外

下列条件可以完成正确曝光的图像，但可能仍导致的 DEI。这种情况应被视为特例，而且不可以应用标准重摄和技术调整规则。

- 视野内的外部患者护罩 （即铅围裙）能够导致出乎意料的低 DEI 和 （UDExp/CDExp）。通过浏览图像，很容易确定存在护罩。
- 系统 FOV 的错误决定会导致出乎意料的低 DEI 和 （UDExp/CDExp）。通过浏览图像，很容易确定在最终图像中存在重要的准直区域。用 Manual Shutter （手动快门）功能纠正 FOV 不能纠正 DEI 值。

Note: 用户必须为解剖图像选择适当的 FOV，始终进行适当的准直。

Quality Check

如果激活自动标签（更多信息，请参考第 13 章：设置参数 - 图像管理），质量检查显示图像质量可以接受并可以自动打印和自动传输图像（如果被激活）。

质量检查指示器是一个显示在图像右下角落白框里的 "T"（Figure 11-9）。质量检查指示器默认为开启。删除指示器表示在结束该数检查后，关闭图像时，该图像不能自动打印或自动传输，只能保存在本地数据库里。

Note: 质量检查指示器只在当前检查中可用。

要删除质量检查指示器，双击白框，"T" 消失。

要恢复质量检查指示器，双击白框，"T" 重新显示。

Figure 11-9 质量检查指示器

Printing Images

Figure 11-10 打印图像选项板

副本数 — #Copies
打印机 — Printer
方向 — Orientation
打印模式 — Print Mode
放大率 — Mag
格式 — Format
介质大小 — Media Size
介质类型 — Media Type
目的地 — Destination
放大类型 — Mag Type
注释 — Annotations
打印 — Print   Print All — 打印所有

添加表单
删除表单
删除所有表单
打印总结

Table 11-6 打印图像选项板描述

Function	Description
[# of Copies]	Defines how many copies to print.
[Printer]	Lists all available printers configured for your system.
[Orientation]	Selects vertical or horizontal orientation of the image on film or paper. Available options are: • Landscape • Portrait
[Print Mode]	Selects what size to print the image. Available options are: • True Size • Fit to Film • Reduced Size
[Magnification]	Only available if Reduced Size is selected for the Print Mode. 只有在 [打印模式] 中选择了 [缩小的尺寸] 时才可用。图像将按所输入的百分比值缩小。可接受的缩小范围是 40% 至 90%。如果将 [实际尺寸] 或 [胶片尺寸] 选择为 [打印模式]，此文本框将被禁用。

Function	Description
[Format]	Selects the print format. Available options are: • Standard • 35 mm • 40 mm
[Media Size]	Shows the available sizes that are configured for the selected printer.
[Media Type]	Selects the type of media to print on. Available options are: • Paper • Clear film • Blue film
[Destination]	Shows configured printers on the system.
[Magnification Type]	Selects the magnification type. Available options are: • Cubic • None
[Annotation]	Selects the amount of annotation to print on the image. Available options are: • Full • Partial • Custom • None More information, please refer to Annotation.
[Print]	Print the selected image.
[Print All]	Print all images.
快捷按钮	
[添加表单]	在图像区域添加一个空白表单。
[删除表单]	删除当前显示的表单。
[删除所有表单]	删除所有可用的表单。
[打印总结]	将显示区域调整为 4*4 的表格，然后显示所有可用表单的缩略图。

从系统打印图像有两种方法：手动打印和自动打印。

自动打印

可以配置系统使其在检查结束后执行自动打印。从应用程序界面获取参数选择。更多关于配置自动打印的信息，请参考 Chatper 16: 设置参数 - 图像管理小节。

手动打印

使用胶片管理器和手动打印按要求打印图像。

* 胶片管理器允许配置和打印系列中的多幅图像。

* 手动打印允许配置和打印当前所选的图像。

手动打印按钮工具底部附近，鼠标控件下方，如 Figure 11-11 所示。

Figure 11-11 手动打印按钮 - 胶片管理器和手动打印

打印多幅图像

按照下列步骤打印多幅图像。

1. 点击胶片管理器。

   ◆ 显示胶片编辑器界面（ Figure 11-12 ）。

Figure 11-12 胶片编辑器界面 - 添加图像前和添加图像后

2. 选择您想要在一个页面显示的图像数量。

   ◆ 如果系列中的图像数量超过了一个页面中可以显示的图像数量，使用 Sheet ［◀］和 ［▶］按钮为每个页面配置打印选项。

3. 用鼠标在图像选项板（ Figure 11-13 ）上点击并拖动图像缩略图，从而打开 Film Composer （胶片编辑器）界面。

Figure 11-13 图像选项板

4. 使用按钮确定和调整打印设置。

• 点击预览，查看图像如何在页面上定位。

• 点击清除页面，删除当前显示的页面上的图像。

• 点击全部清除，删除所有页面上的图像。

• 点击打印薄片，打印当前显示的页面。

• 点击打印全部，打印所有的页面。

5. 打印设置，确定或调整打印机配置。（更多信息，请参考 Figure 11-14 和 Table 。）

6. 完成后点击关）。

打印当前图像

按照下列步骤打印单幅图像。

1. 从图像工具选择板上选择图像。

2. 点击手动打印。

   ◆ 显示打印图像界面。

3. 如 Table 所示，调整设置。

4. 点击预览，确定图像位置正确。

   ◆ 如果图像位置错误（如 Figure 11-14 所示），点击取消返回打印图像界面并且调整设置。

   ◆ 如果可以接受图像位置，点击打印，打印此图像。

Figure 11-14 错误设置的打印预览示例

5. 点击打），打印此图像。

　◆ 取消关闭打印图像界面，不打印并返回图像浏览器界面。

Figure 11-15 打印图像界面

Sending Images

如果激活了自动发送，在检查关闭时所采集的图像会自动发送到预先指定的位置。更多关于配置自动发送的信息，请参考 Chatper 16: 设置参数。

Saving Changes to Images

当关闭图像浏览器界面或结束检查时，您可以选择保存或者放弃对图像所做的改变。

1. 如果是在活动检查中，点击采集界面上的关闭按钮。

2. 如果是在浏览模式中，点击图像浏览器界面上的关闭按钮。

   ◆ 显示一条消息：＂您是否要保存对图像的修改？＂

3. 点击 [是]。

   ◆ 取消关闭界面并返回图像浏览器界面。

   ◆ [否] 关闭图像浏览器界面，而不保存改变。

Note: 添加注释时不会产生新的图片。

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Chapter 12

Digital Detector Application

The digital detector of this system can be shift between the Digital Wall Stand and Integrated Table (Radiographic Stretcher Table / Patient Stretcher). This section is intended to outline the digital detector's shift application.

Topics covered include:

- Wall Stand Mode
- Integrated Table Mode
- Integrated Table Top (Stretcher Table Top) Mode
- Digital Cassette Mode
- Steps for cassette installation

Wall Stand Mode

Pull out the wall stand detector tray -> Insert the digital detector into the wall stand.
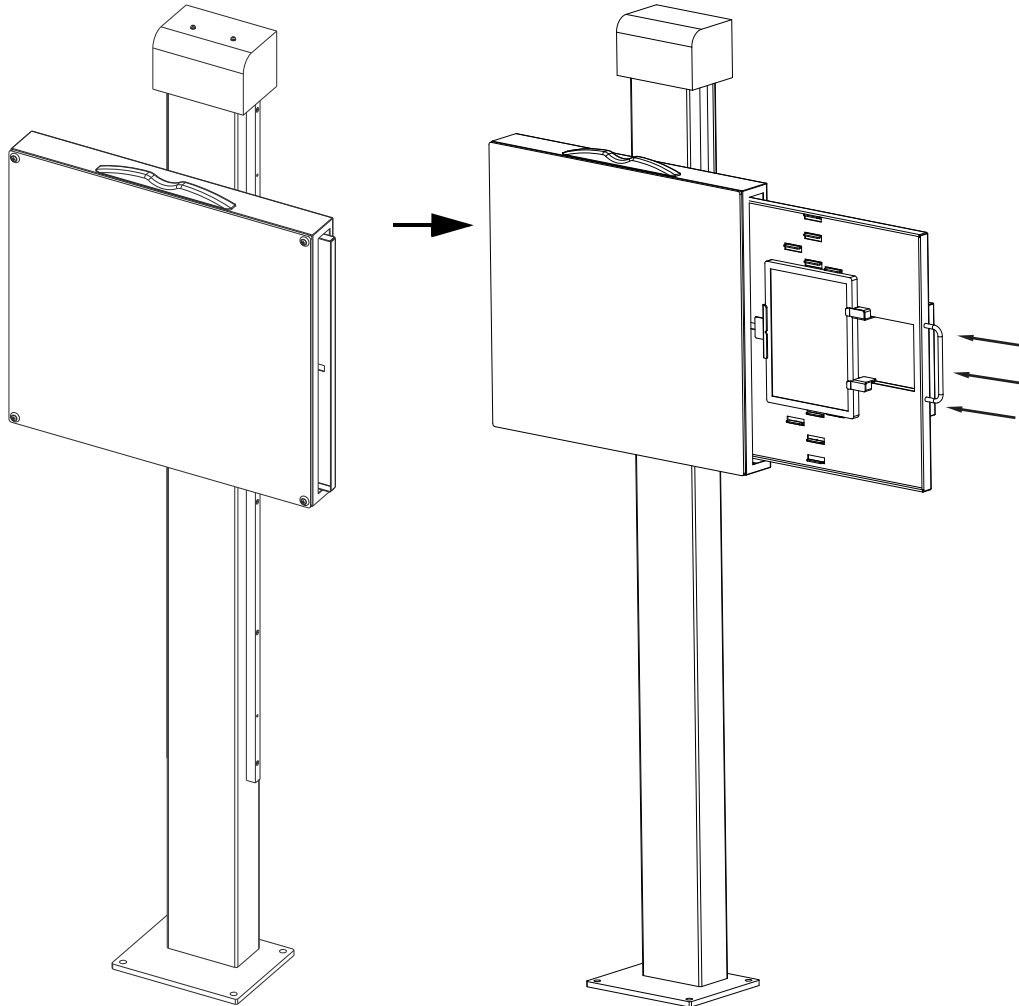
- ◆ 将无线影像探测器放入片屉的步骤请参考 Steps for cassette installation。

Integrated Table Mode

Pull out the table detector tray -> Insert the digital detector into the integrated table.
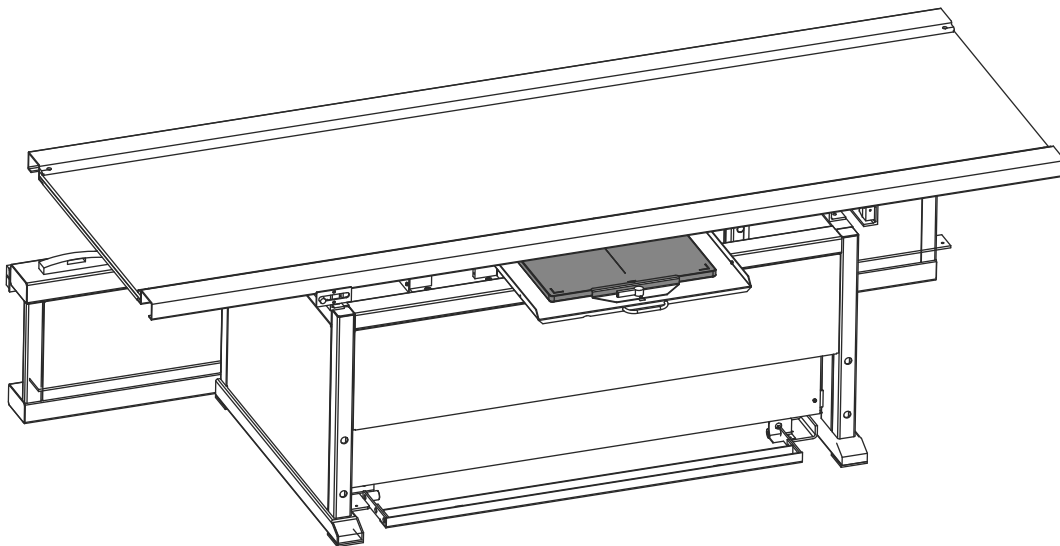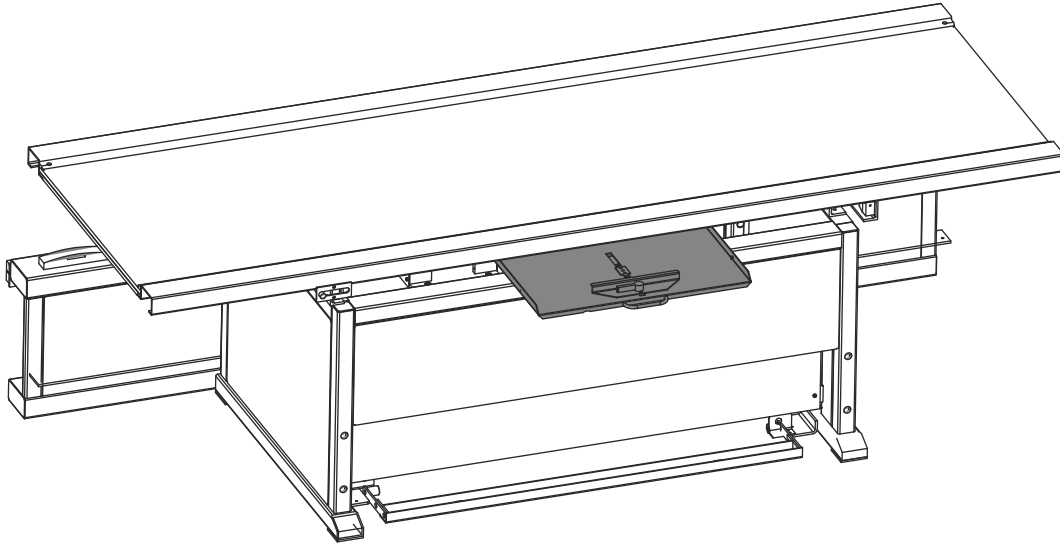
◆ 将无线影像探测器放入片屉的步骤请参考 Steps for cassette installation。

Integrated Table Top (Stretcher Table Top) Mode

Put the digital detector to the appropriate location on the table top.

Detector
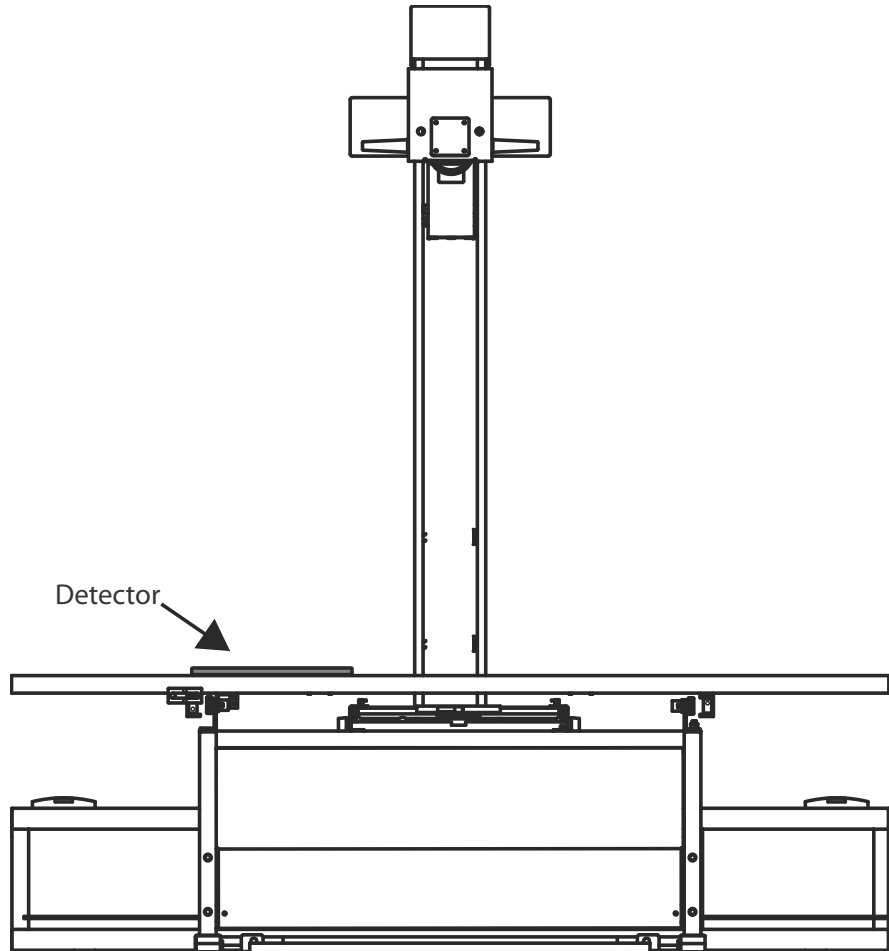
Digital Cassette Mode

Steps for cassette installation
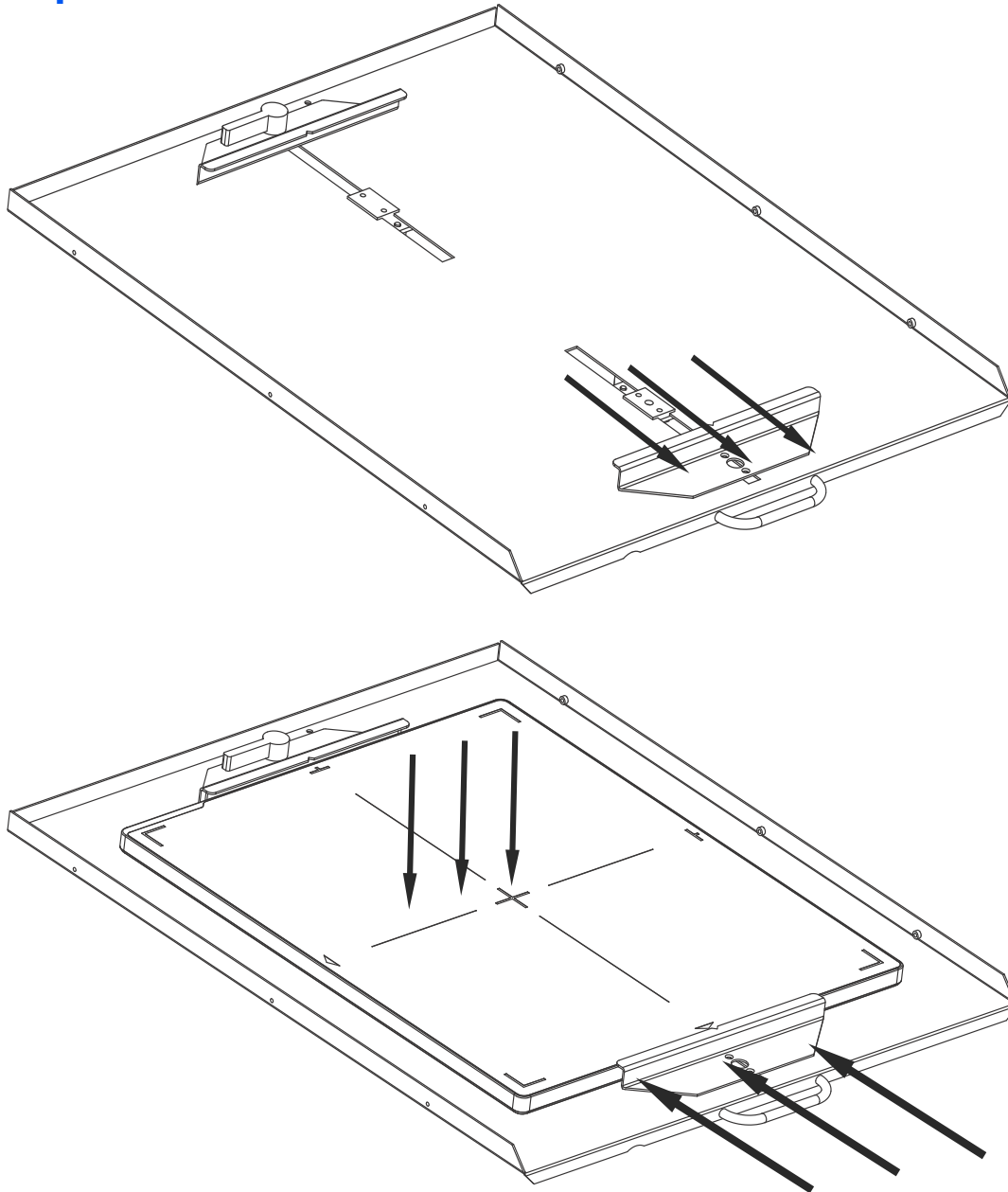
1. 分开夹具。

2. 放入影像探测器。

3. 使用夹具将影像探测器进行固定。

Chapter 13

Sharing System Components

本章概述了 XR116 系统组件在不同应用模式下的共享使用。

主要包含以下内容：

- 在固定式应用间共享影像探测器
- 在固定式应用间共享影像探测器和工作站
- 在固定式和移动式应用间共享影像探测器
- 在固定式和移动式应用间共享 XR116 组件（影像探测器＋工作站＋便携式显示器）
- 在移动式系统间共享影像探测器
- 在移动式系统间共享 XR116 套件（影像探测器＋工作站＋便携式显示器）

在固定式应用间共享影像探测器

XR116 系统中的影像探测器可以在不同的固定式应用间共享使用，如下图所示。
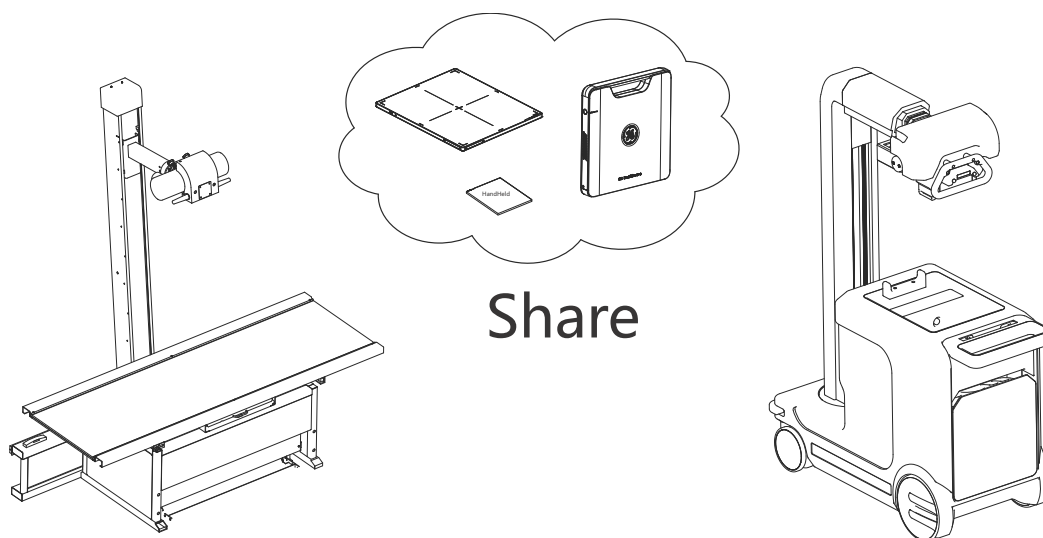
Figure 13-1 在固定式系统间共享影像探测器
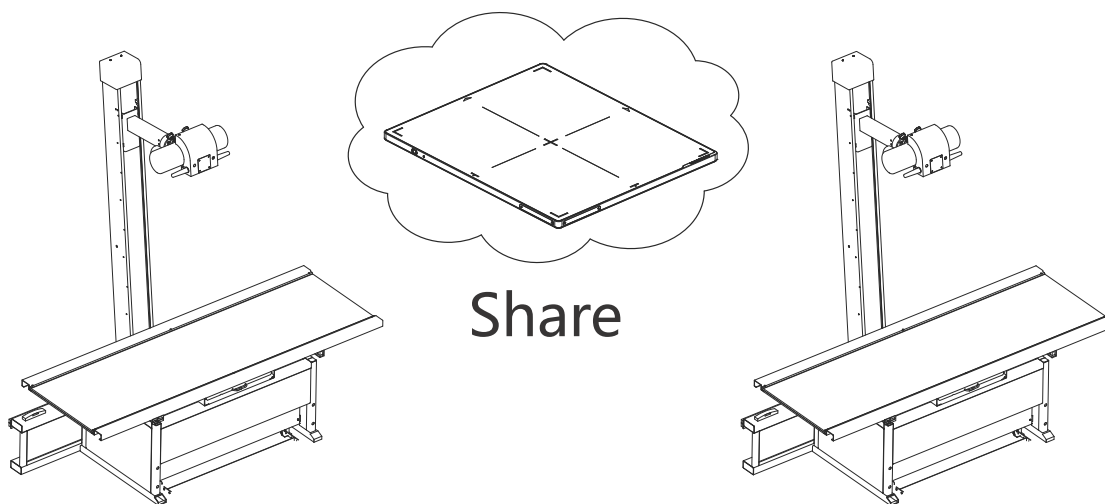
共享影像探测器：

1. 在原固定式系统上，将影像探测器从首选探测器切换为备用探测器。有关如何切换影像探测器的信息，请参考 ...。

2. 在目标固定式系统上，注册共享的影像探测器。有关如何注册影像探测器的信息，请参考 ...。

3. 在目标固定式系统上，选择共享影像探测器为首选探测器。

Note: 固定式系统间只能共享影像探测器，不能共享使用 XR116 系统的其它套件。

在固定式应用间共享影像探测器和工作站

XR116 系统中的影像探测器和影像工作站也可以在不同的固定式应用间共享使用，如下图所示。

Figure 13-2 在固定式系统间共享影像探测器和影像工作站
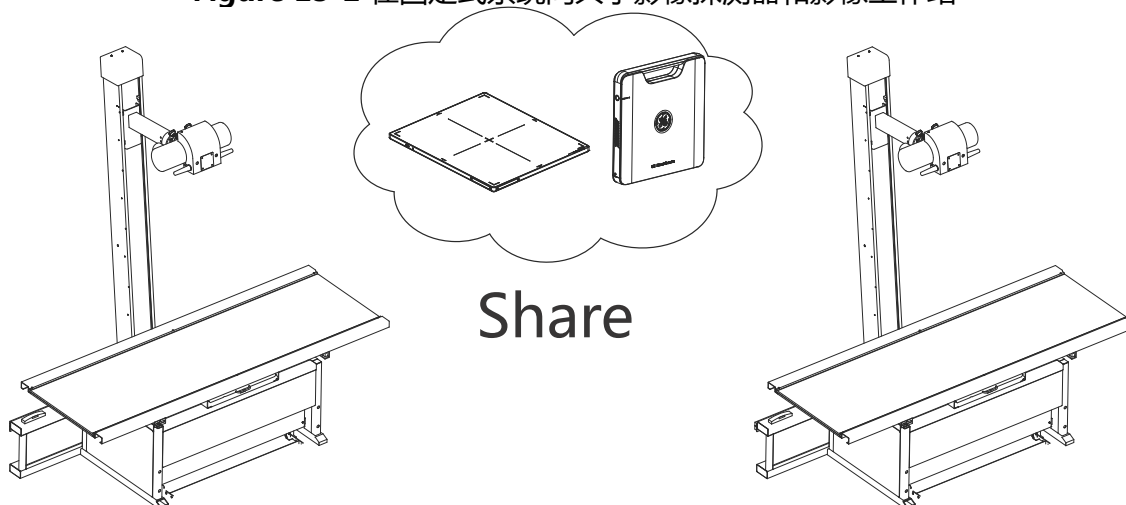
共享影像探测器和影像工作站：

1. 将 XR116 组件（影像探测器 + 工作站）从原固定式系统移动到目标固定式系统。

Note: 工作站从原固定式系统中的扩展坞中拔出后，原固定式系统中的无线接入点将被关闭。

Note: 工作站插入目标固定式系统的扩展坞插槽后，目标固定式系统的无线接入点将自动启动，影像探测器和工作站的无线连接将随后在目标固定式系统中自动连接。

在固定式和移动式应用间共享影像探测器

XR116 系统中的无线影像探测器可以在固定式和移动式应用间共享使用，如下图所示。

Figure 13-3
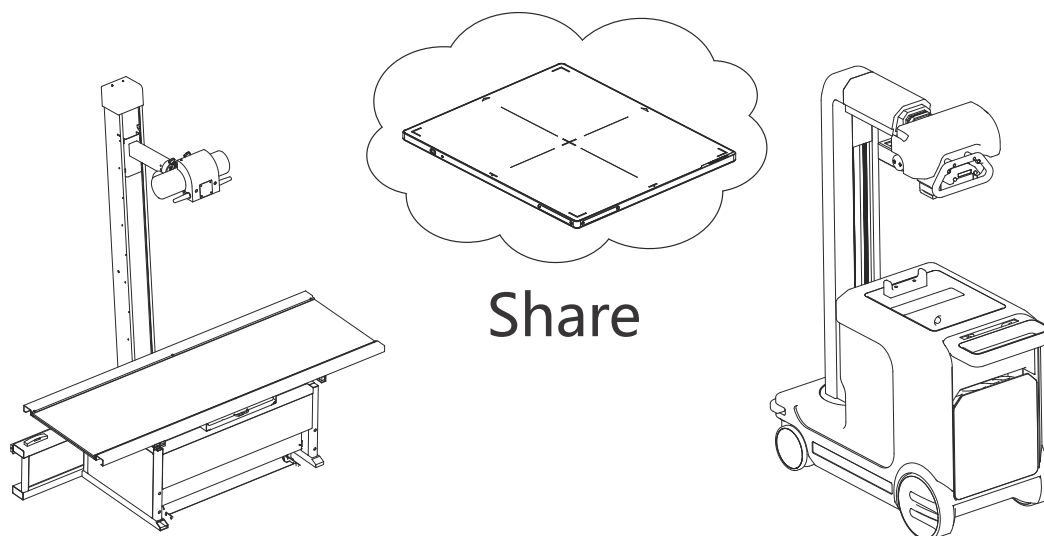
共享无线影像探测器：

1. 在原固定式系统上，将影像探测器从首选探测器切换为备用探测器。有关如何切换影像探测器的信息，请参考 ...。

2. 在目标移动式系统上，注册共享的影像探测器。有关如何注册影像探测器的信息，请参考 ...。

3. 在目标移动式系统上，选择共享影像探测器为首选探测器。

在固定式和移动式应用间共享 XR116 组件
（影像探测器 + 工作站 + 便携式显示器）

XR116 组件（影像探测器 + 工作站 + 便携式显示器）也可以在固定式和移动式应用间共享使用，如下图所示。

Figure 13-4 共享 XR116 组件

共享无线影像探测器：

1. 将 XR116 组件（影像探测器 + 工作站 + 便携式显示器）从原固定式系统移动到目标移动式系统。

Note: 工作站从原固定式系统中的扩展坞中拔出后，固定式系统中的无线接入点将被关闭。

Note: 工作站从扩展坞拔出后将自动切换为移动式应用。

Note: 便携式显示器和工作站必须绑定使用，不能单独在系统间进行共享。

在移动式系统间共享影像探测器

XR116 系统中的无线影像探测器在移动式应用间也可以共享使用，如下图所示。
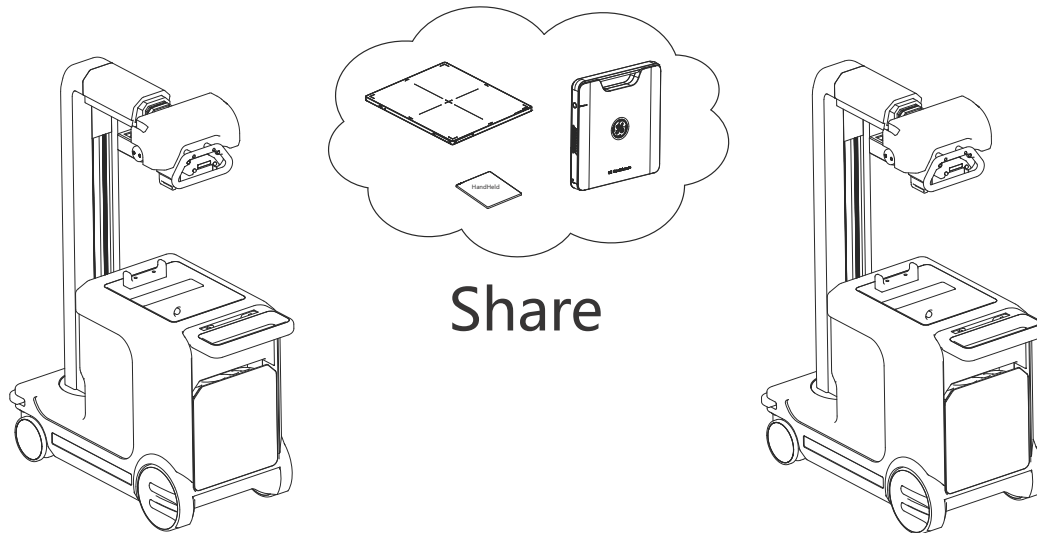
Figure 13-5 移动式应用共享影像探测器
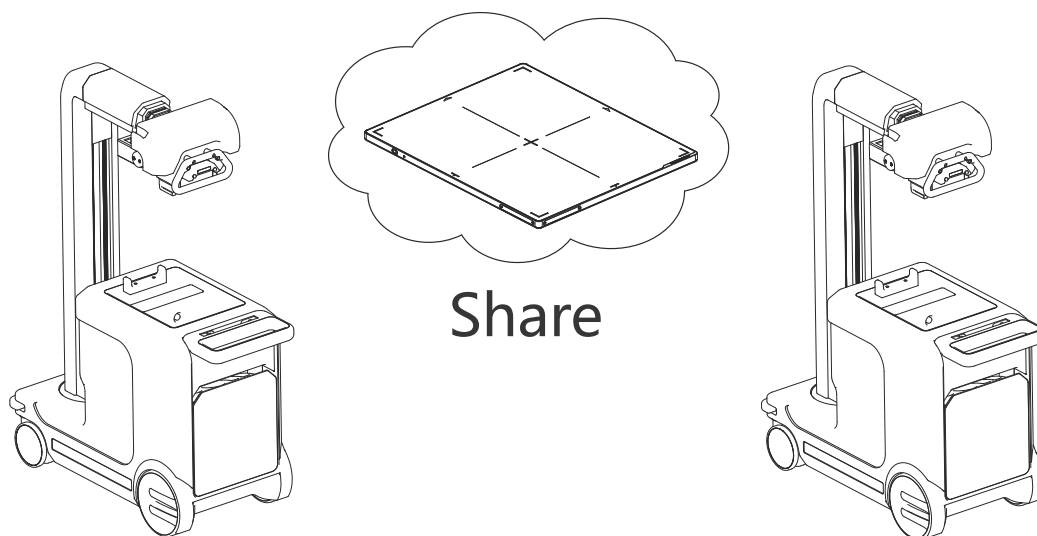
共享无线影像探测器：

1. 在原移动式系统上，将影像探测器从首选探测器切换为备用探测器。有关如何切换影像探测器的信息，请参考 ...。

2. 在目标移动式系统上，注册共享的影像探测器。有关如何注册影像探测器的信息，请参考 ...。

3. 在目标移动式系统上，选择共享影像探测器为首选探测器。

在移动式系统间共享 XR116 套件
（影像探测器 + 工作站 + 便携式显示器）

XR116 组件（影像探测器 + 工作站 + 便携式显示器）还可以在移动式应用间共享使用，如下图所示。

Figure 13-6 XR116 组件共享

共享无线影像探测器：

1. 将整套 XR116 系统直接从原移动式系统移动到目标移动式系统。

Note: 便携式显示器和工作站必须绑定使用，不能单独在系统间进行共享。

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第 14 章

质量保证程序

本章介绍了 GE 便携式 DR 探测器的质量保证程序。为了确保该探测器的性能持续稳定，必须建立定期检查计划。

质量保证程序包括一系列检查，应当每周对系统进行这些检查，以对图像质量进行量化检查，此程序中的许多背景作业都已经自动化了，并且要求按规定的顺序进行图像采集。

本章的主要内容包括：

- 何时执行 QAP
  - 正常 QAP
- QAP 准备
- 进行正常 QAP （ Normal QAP ）
  - 正常 QAP 未通过 （ Failed Normal QAP ）
- 检查结果历史记录 （ Result History ）

正常 QAP 是指需要对平面体模进行曝光的全面 QAP 检查。其结果（通过或未通过检查）记录于检查结果历史记录摘要中以供维修人员查阅。正常 QAP 检查约需 15 分钟即可完成。

正常 QAP 检查包括所有对探测器进行的检查，此外，还包括其它因素的检查。表 14-1 比较了两种检查的检查因素。

表 14-1 质量保证程序的检查因素

正常 QAP	
• 电子噪声	• 边缘检查
• 相关噪声	• 同质性直方图 （ Homogeneity Histogram ）
• ARC 数字测试	• 亮度不均匀性
• ARC 模拟测试	• 坏像素
• 垂直杆校准	

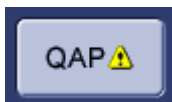# 何时执行 QAP

本节介绍所推荐 QAP 的时间以及任何其它需要进行 QAP 的情况。

正常 QAP

正常 QAP 应：

- 按计划每周进行。
- 在 QAP 按钮上显示警报图标时进行。（如图 14-1）
- 在发现有图像质量降低时进行。

注意： 在确定正常 QAP 测试时间时，应计划用 15-20 分钟时间进行该测试 . 测试时，系统至少需停机（无曝光）10 分钟，其它测试约需 5 分钟完成。

图 14-1 带有警报图标的 QAP 按钮

QAP 准备

开始 QAP 之前，一定要注意以下几点：

- 关闭或暂停任何开着的检查。
- 关闭任何正在查看的检查。
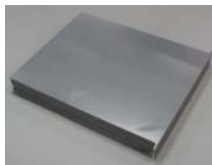- 清除探测器和光束通路上的所有物体（只在正常 QAP 时）

点击 QAP 按钮，开始 QAP 程序。QAP 按钮位于工作列表或采集界面底部。

注意： 如果有打开的检查或正在查看的检查，不可进行 QAP。

进行正常 QAP （ Normal QAP）

正常 QAP 要进行一些用平面体模进行曝光的测试。GE 便携式 DR 探测器 QAP 箱（GE Portable DR Detector QAP kit）内有一个平面体模（如下图），其大小与限束器适应。

有些曝光技术推荐用于体模曝光。 系统自动设定曝光条件，但在曝光前需确认曝光设置。

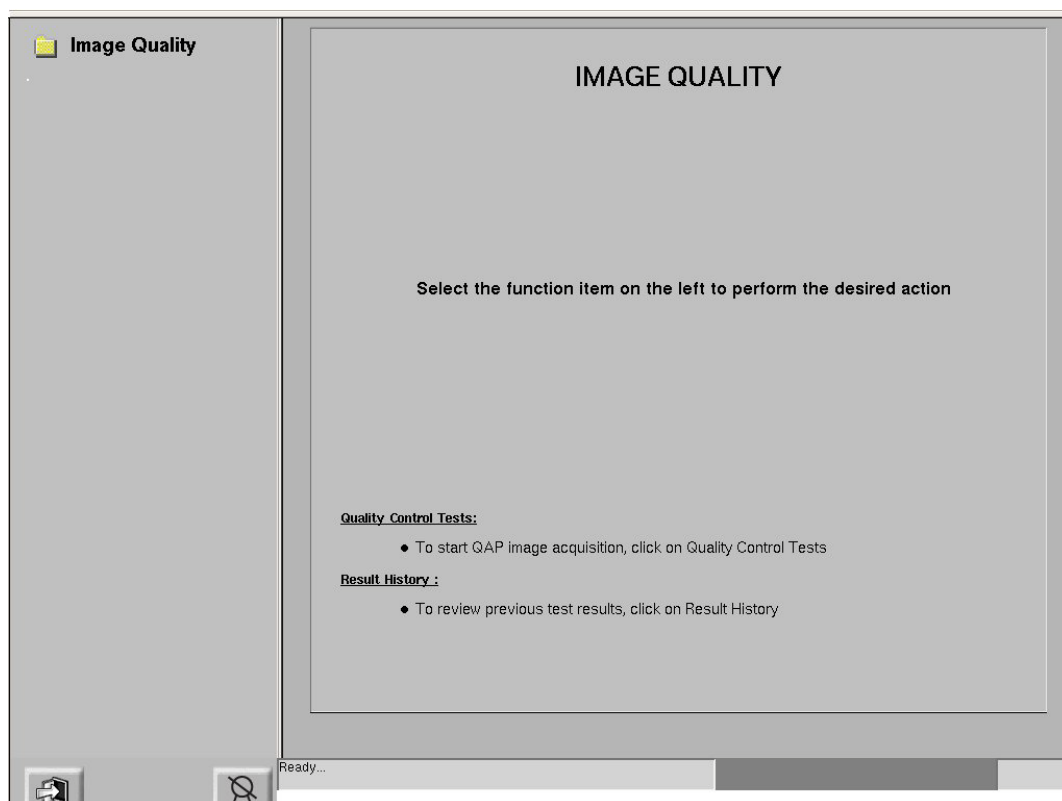**图 14-2** 平面体模

⚠

小心： **应用体模完成 QAP 后，请在系统复位或关机前将其移除。**

按照该程序进行正常 QAP 测试。

1. 按下位于工作列表或采集界面底部的 [QAP] 按钮。

    ◆ 显示图像质量界面。
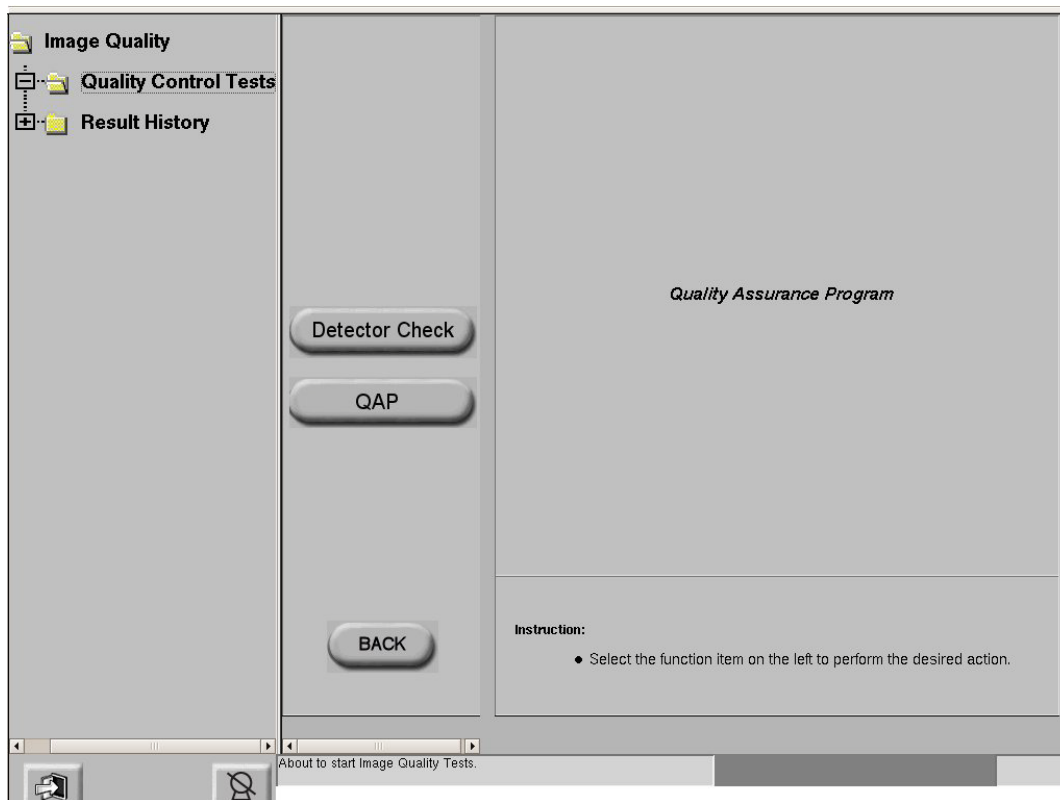
图 14-3 图像质量界面

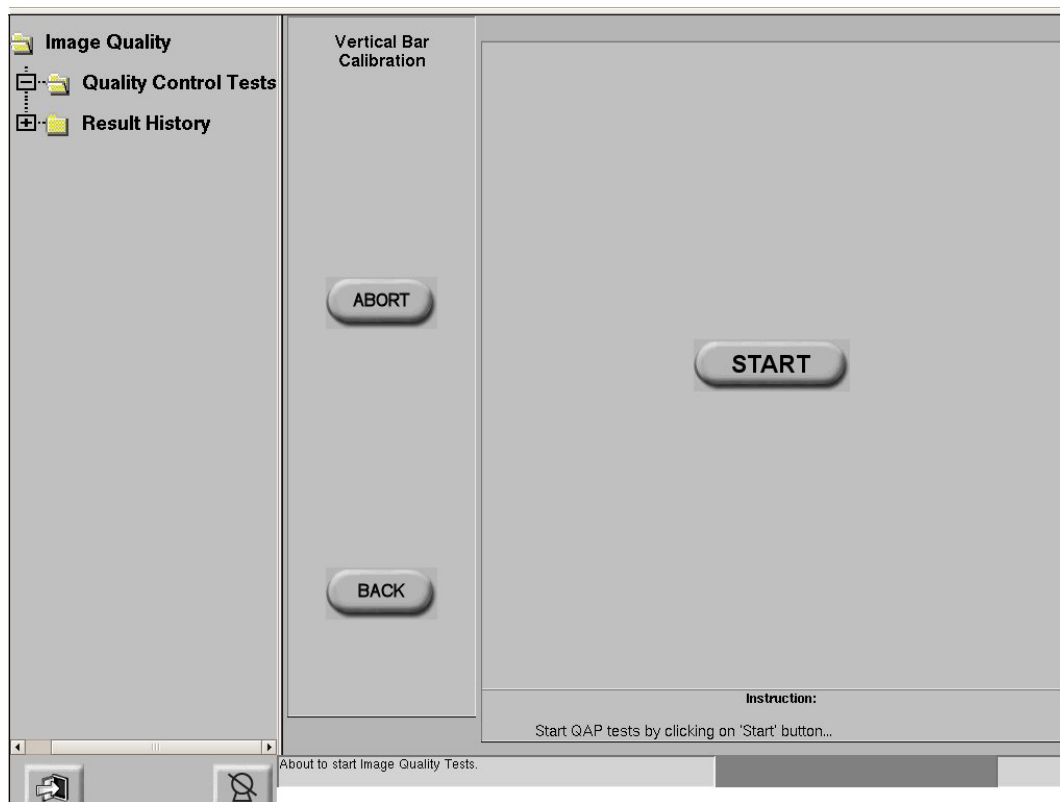2. 从界面的左侧选择图像质量（如图 14-4）。

图 14-4 从界面的左侧选择

3. 从界面的左侧选择 质量控制测试。

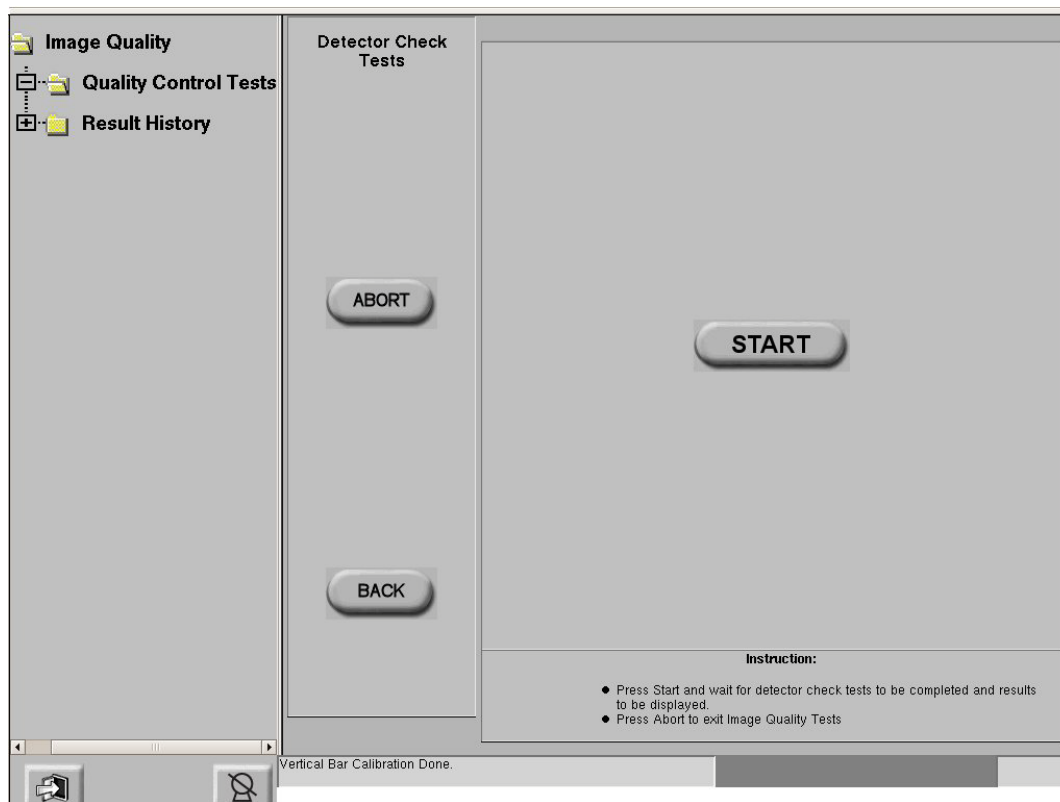**图 14-5** 质量控制测试界面

4. 按下 [QAP] 开始 QAP 测试。垂直杆校准界面出现。

图 14-6 垂直杆校准界面。

5. 按下 [START] 按钮开始垂直杆校准测试。

注意： 正常 QAP 要求在开始测试的垂直杆校准之前，系统应进入空闲状态（in an idle state ）（无曝光）至少 10 分钟。系统将会在 Q-QAP 和垂直杆校准界面上显示一个定时器图标（ timer icon ）。该定时器从 10 分钟开始到及时直到 0 为止。这段时间里，显示 [INHIBIT] 按钮，[START] 按钮失活。
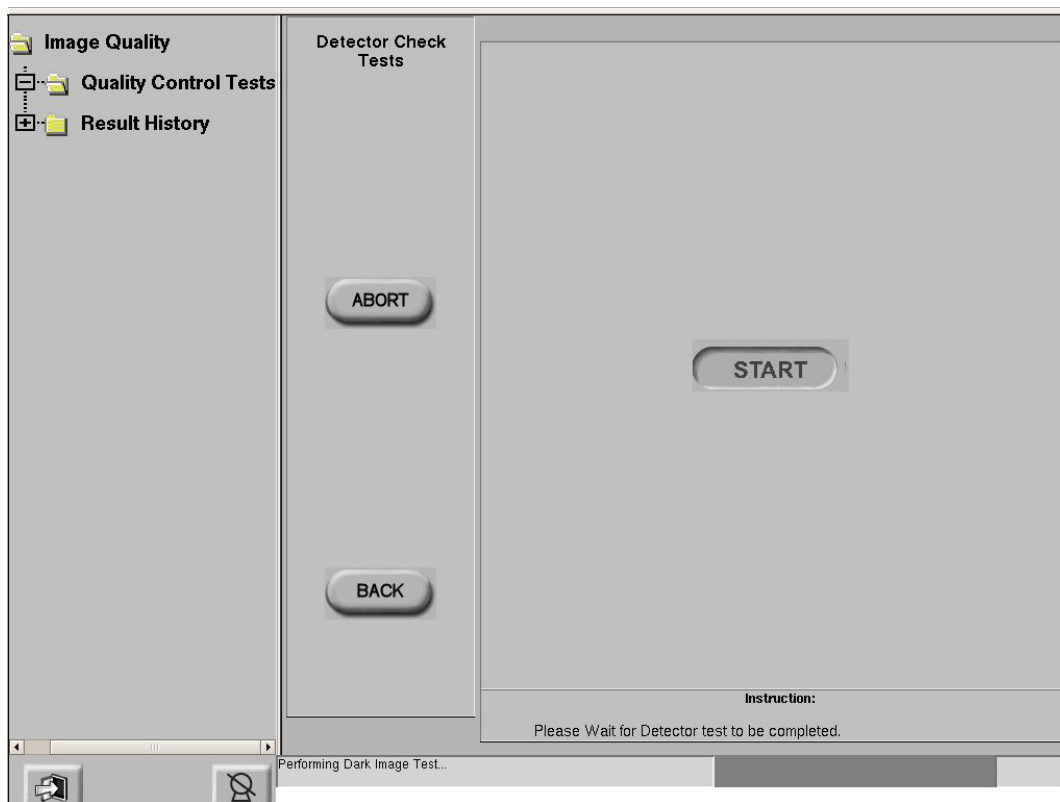
6. 等待测试完成。

   ◆ 显示探测器检查测试界面。
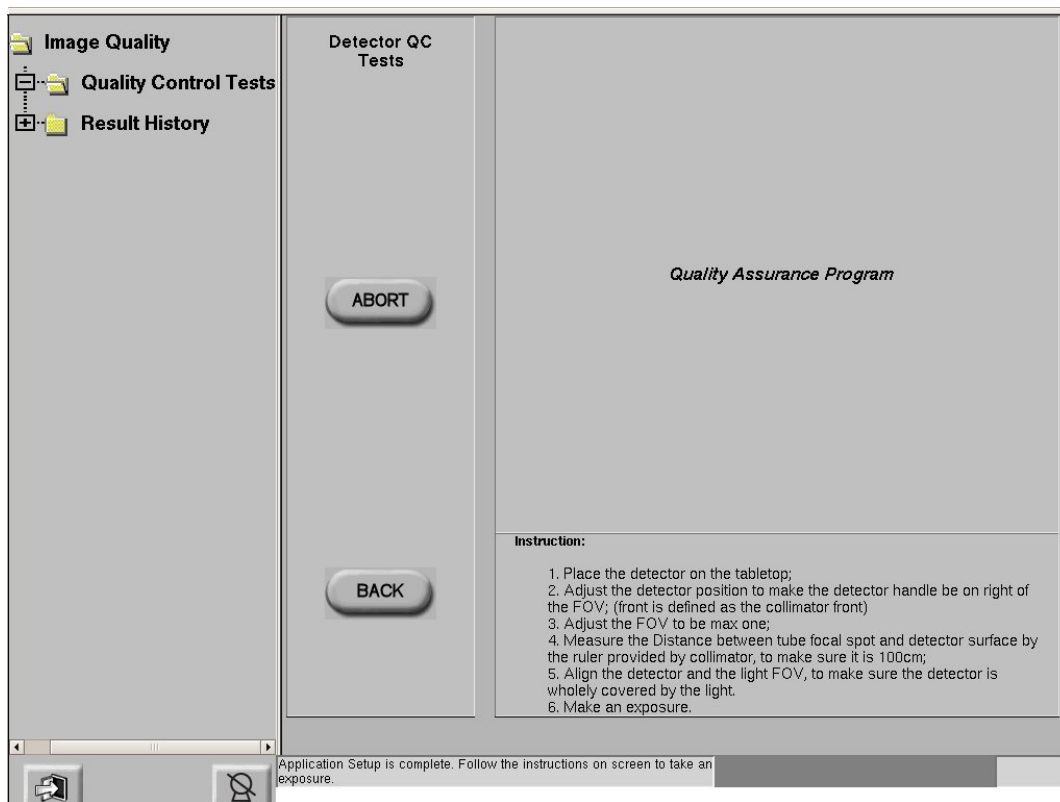
图 **14-7** 探测器检查测试界面

7. 按下 [START] 开始暗片测试。

图 **14-8** 开始暗片测试

8. 应用设置完成后，按照界面上的说明完成本部分测试：

图 **14-9** 显示质量控制（QC Tests）界面

a) 将探测器放置床面板上；

b) 调节探测器位置，使探测器手柄位于光野右侧；

c) 将光野打开至最大；

d) 用限束器的直尺测量球管焦点与探测器表面距离，确定为 100 厘米；

e) 将探测器置于光野正下方，确定其被光野完全覆盖；

f) 曝光。

9. 曝光完成后，显示质量控制（QC Checks）完成界面。

图 14-10 显示质量控制（QC Tests）完成界面
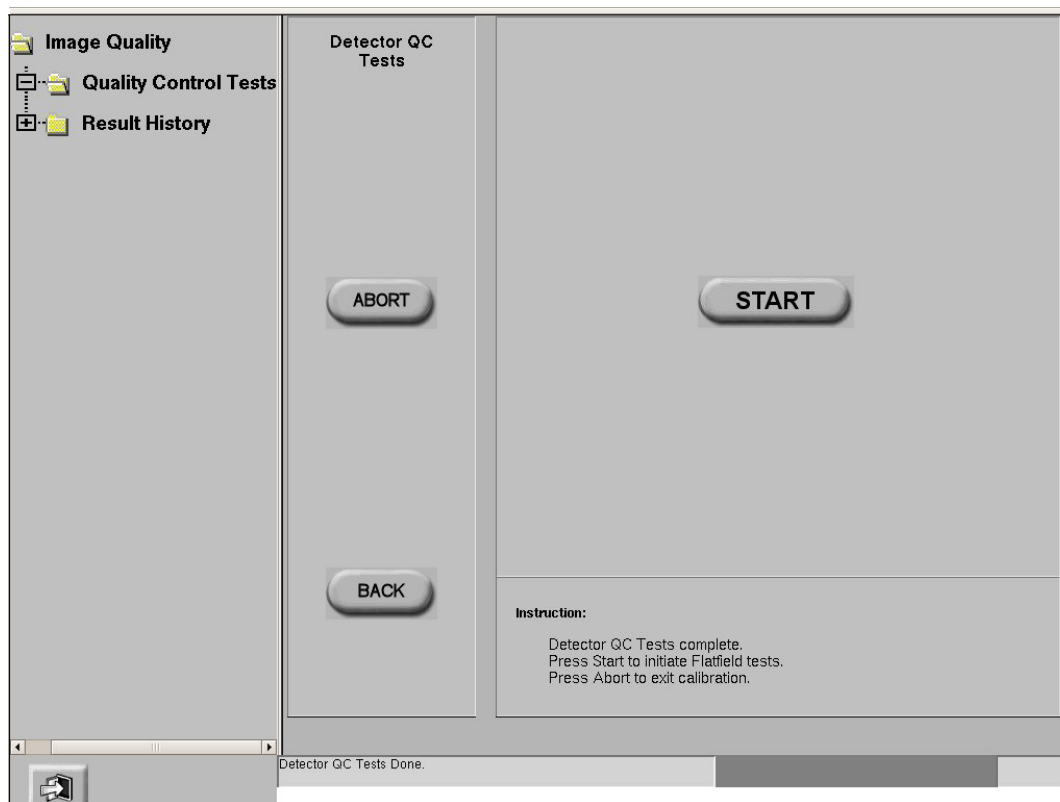
10. 按下 [START] 按钮开始平面测试（Flat-field tests）。

图 **14-11** 显示平面测试 （ Flat-field tests ）界面。
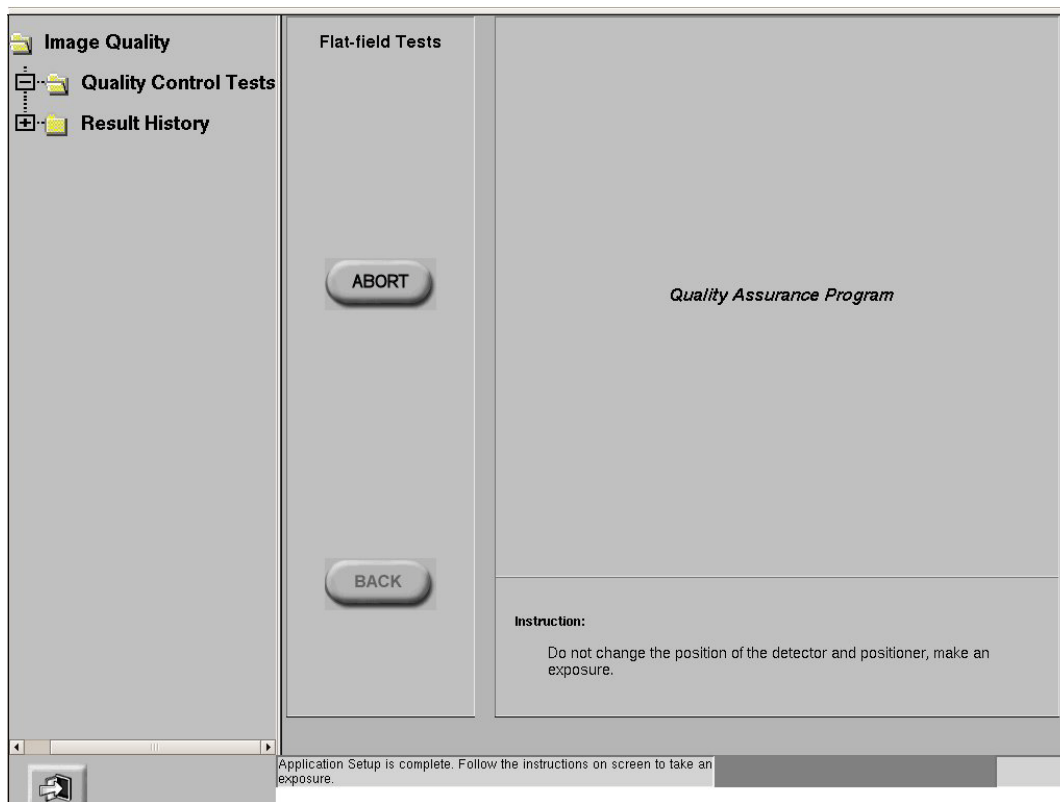
11. 按照界面上的说明完成本部分测试：不要改变探测器与子系统的位置，并进行曝光。

图 14-12 平面采集图像 （Flat-field acquired image）

图 **14-13** 显示第二个平面测试（Flat-field Tests）界面。

12. 按照界面显示指导完成测试。

图 14-14 平面采集图像

13. 点击平面采集图像的任意位置回到 QAP 界面。

  ◆ 测试完成后，自动显示 Normal-QAP Results（正常 QAP 结果）界面。

图 14-15 QAP Results（QAP 结果）界面
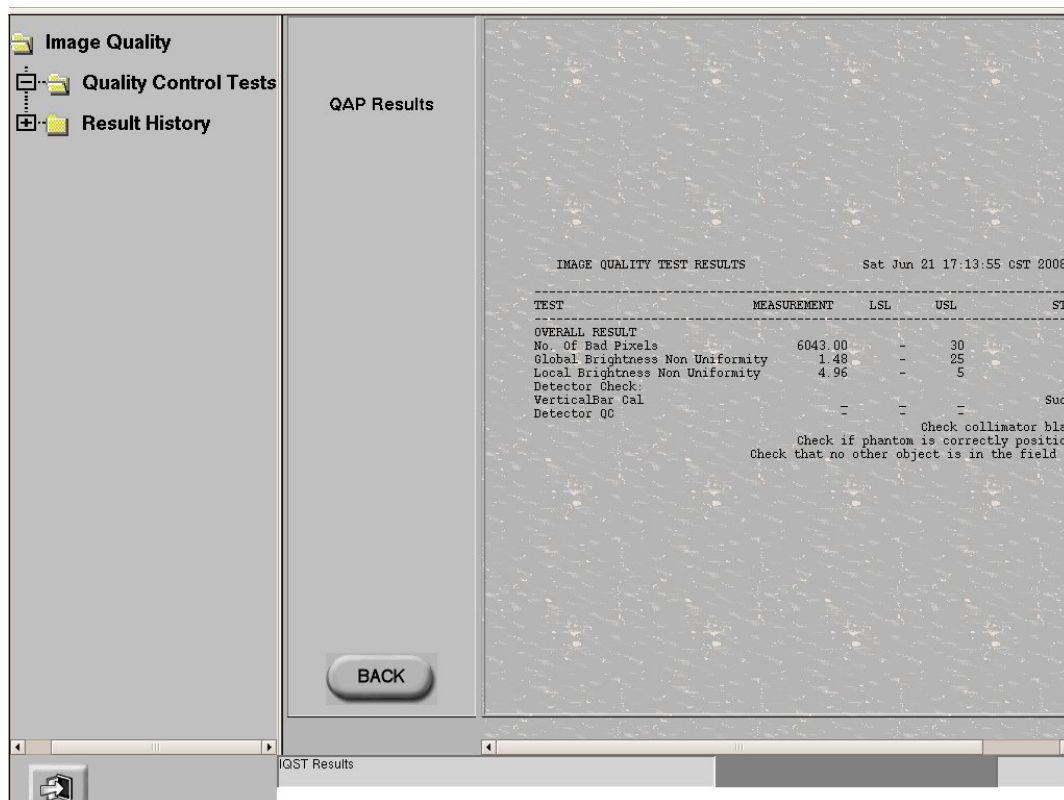
14. 查看每项测试的状态 （Status）（最右的一栏）。

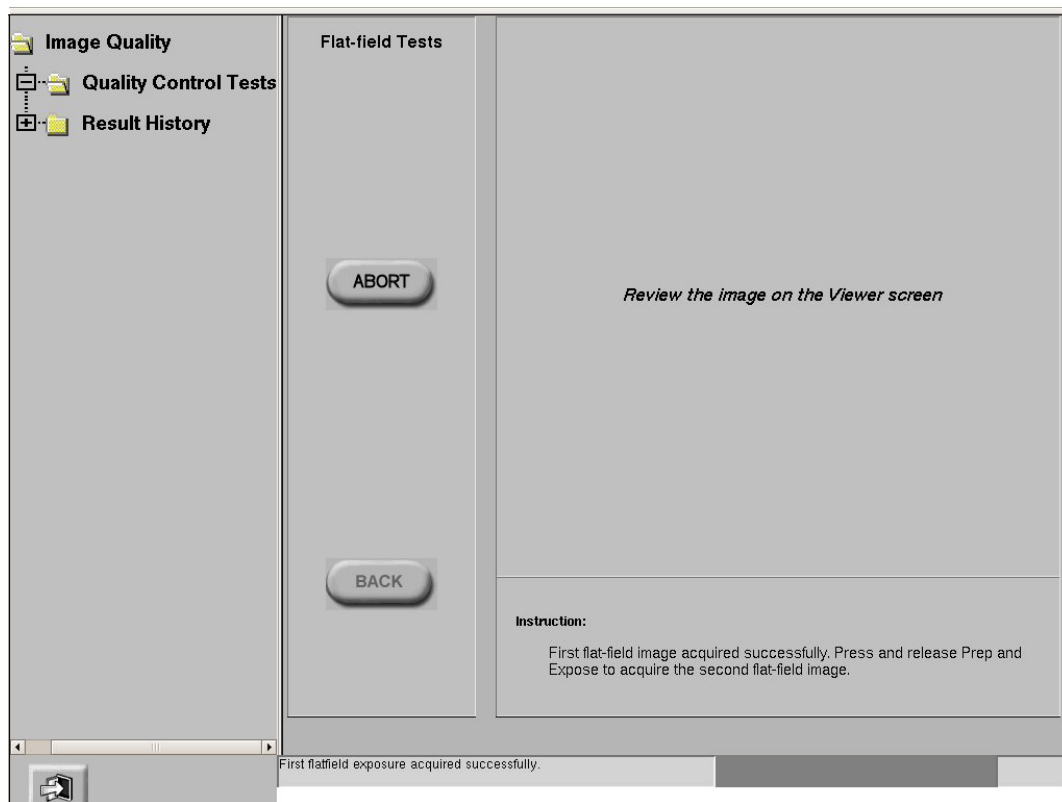 ◆ 如果所有的测试全部通过：QAP 完成。点击退出按钮返回到工作列表界面，然后继续。

  ◆ 如果有的测试未通过：参照正常 QAP 未通过（ Failed Normal QAP ）一节了解更多信息。

正常 QAP 未通过 （Failed Normal QAP）

在正常 QAP 未通过的情况下，重复正常 QAP 程序已确认测试未通过。本节确定了一些需要检查的常见问题。

- 如果边缘检查 （Border check）和 / 或同质性直方图 （Homogeneity Histogram ）测试未通过，检查探测器和球管的对中 （alignment），然后重复测试。（对中不当可能会引起亮度非均匀性 （brightness non-uniformity ）和劣质像素 (bad pixels))

- 检查限束器叶片 （collimator blade）的位置，确保其完全打开，即：限束器叶片不在视野 （field of view）范围。

如果确认单项测试未通过，请联系售后服务（call to schedule service）。虽然系统可以运行，但需要检查，也可能需要校准。

如果确认多项测试未通过，可能会影响图像质量；停止使用该系统，请求立即维修。

图 14-16 QAP 结果未通过


```
IMAGE QUALITY TEST RESULTS          Fri Aug 13 14:36:19 CDT 2004
-----------------------------------------------------------------
TEST                            MEASUREMENT   LSL    USL    STATUS
OVERALL RESULT                                               FAIL
No. Of Bad Pixels                   0.00       -     30     PASS
Global Brightness Non Uniformity   24.35       -     10     FAIL
Local Brightness Non Uniformity     1.47       -      5     PASS
SNR Non Uniformity                 30.65       -     60     PASS
Spatial MTF at 0.5 lp/mm           86.67      70      -     PASS
Spatial MTF at 1.0 lp/mm           69.91      53      -     PASS
Spatial MTF at 1.5 lp/mm           54.24      35      -     PASS
Spatial MTF at 2.0 lp/mm           39.25      23      -     PASS
Spatial MTF at 2.5 lp/mm           27.91      17      -     PASS
Contrast/Noise Ratio 1             10.71       3      -     PASS
Resolution Non Uniformity          30.24       -     60     PASS
```
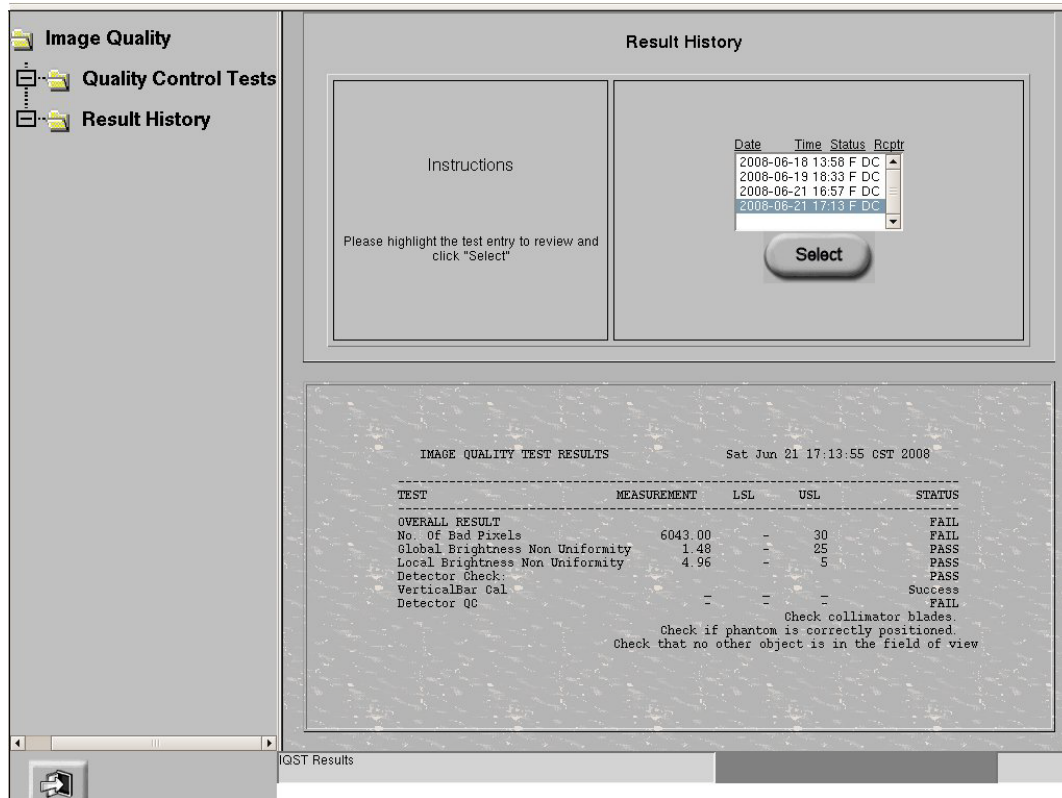
检查结果历史记录（Result History）

正常 QAP 完成后，系统生成一页测试摘要（ test summary page）。测试结果摘要表包括内容有描述性名称（descriptive names）测定值，测试规格 (LSL 和 / 或 USL) 以及通过 / 未通过状态。

最少包含有 25 项正常 QAP 测试结果。

按照以下程序查看以前正常 QAP 测试的结果。

1. 按下位于窗口左侧的 [RESULT HISTORY]（检查结果历史记录）按钮。

   ◆ 显示 Result History （检查结果历史记录）界面。

2. 在列表上按下一个测试条目（test entry）选择该项。

3. 按下 [SELECT]（选择）。

   ◆ 显示测试详细内容。

图 14-17 QAP Result History （检查结果历史记录）界面

Chapter 15

Maintenance

It is the owners responsibility to provide regular periodic maintenance and service. Only this type of maintenance program can identify potential problems.

Topics covered include:

- Periodic Maintenance
- Qualified Service
- Cleaning and Disinfecting
- Recycling

Periodic Maintenance

Periodic maintenance is required for continued SAFE operation. Periodic maintenance should be performed as specified in the maintenance schedule of the service manual by qualified personnel. Descriptions and scheduled frequency of the required periodic maintenance are provided in the Service manual (# *******) supplied with the equipment. Inspection intervals are based on average daily use of one eight hour shift.

These periodic maintenance procedures will be performed by GE service if contracted to do so. Generally, most of the parts need maintenances once a year; general cleaning and painting as required; More frequent inspection is appropriate where equipment use is above average.

⚠️

CAUTION: **Failure to perform the periodic inspection and maintenance could allow deteriorating conditions to develop without being detected. This deterioration could result in equipment failures, which could cause serious injury or equipment damage.**

⚠️ **CAUTION:在执行维护之前，取下电源插座的电源插头。**

Qualified Service

Safe equipment performance requires the use of service personnel specially trained on medical X-ray apparatus. General Electric Medical Systems and its associates, maintain a world-wide organization of stations from which to furnish periodic and/or emergency service on a contract basis. A GE representative will be glad to discuss this plan. General Electric Medical Systems X-ray equipment contains operating safeguards designed to provide maximum safety. Before calling for service, be certain proper operating procedures are being used.

Cleaning and Disinfecting

This equipment should be cleaned frequently, particularly if corroding chemicals are present. Use a cloth moistened in warm soapy water (use mild soap) to clean the trim and nameplate of the Operator's Controls. Wipe with a cloth moistened in clean water. Do not use cleaners or solvents of any kind as they may dull the finish or blur the lettering. Polish with a pure liquid or paste wax. Other surfaces of the equipment can be cleaned using a clean cloth moistened slightly with a good mild cleaner and polish acceptable for use on enameled metal surfaces. Before each use, equipment surfaces that contact the patient should be cleaned with an EPA registered, low-level disinfection or sanitizing agent.

The following chemicals and products have been tested and approved by GE for cleaning the GE Image Workstation:

• 酒精、中性洗涤剂、普通盐水、漂白剂

有关影像探测器的清洁与消毒，请参考无线影像探测器章节中的 Cleaning 小节。

有关便携式显示器的清洁与消毒，请参考便携式显示器的操作手册。

⚠️

CAUTION:In the event of equipment contacting broken skin or being used with infected or immune compromised patients, the equipment should be cleaned using EPA cleared and EPA registered high-level disinfecting agents.

Note: Be sure to follow the label instructions and pre-cautions for use, storage, and disposal of all disinfecting agents.

Recycling

Packing Materials

The materials used to pack our equipment are recyclable. They must be collected and processed in accordance with the regulations in force for the country where the machines or accessories are unpacked.

Machines or Accessories at end-of-life

The elimination of machines and accessories must be in accordance with national regulations for waste processing. All materials and components that could pose a risk to the environment must be removed from the machines at end-of-life and accessories (examples: dry and wet cell batteries, etc.).

Please consult your local GEHC representative before discarding these products.

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第 16 章

设置参数

参数允许特级用户定义系统以便使用。也允许您预先定义 X 射线程序参数，以便检索保存在内存中的任意一个程序。这样，您可以获取专为该类程序所编的技术因素。本章说明可供您利用的参数，及如何激活或改变参数以便您使用。

本章说明如何为系统上的各种功能设置参数。您可以激活几个自动联网和打印功能，自定义系统默认注释、图像方向和图像处理参数进行自定义。您还可以将常用操作员姓名、医师姓名保存在系统中，以备日后使用。

本部分向您介绍了成功创建和编辑预置程序从而自定义系统所需的概念。

参数被设置于应用程序界面（图 16-1）上，通过点击工作列表中的 [应用程序] 可以访问该界面。
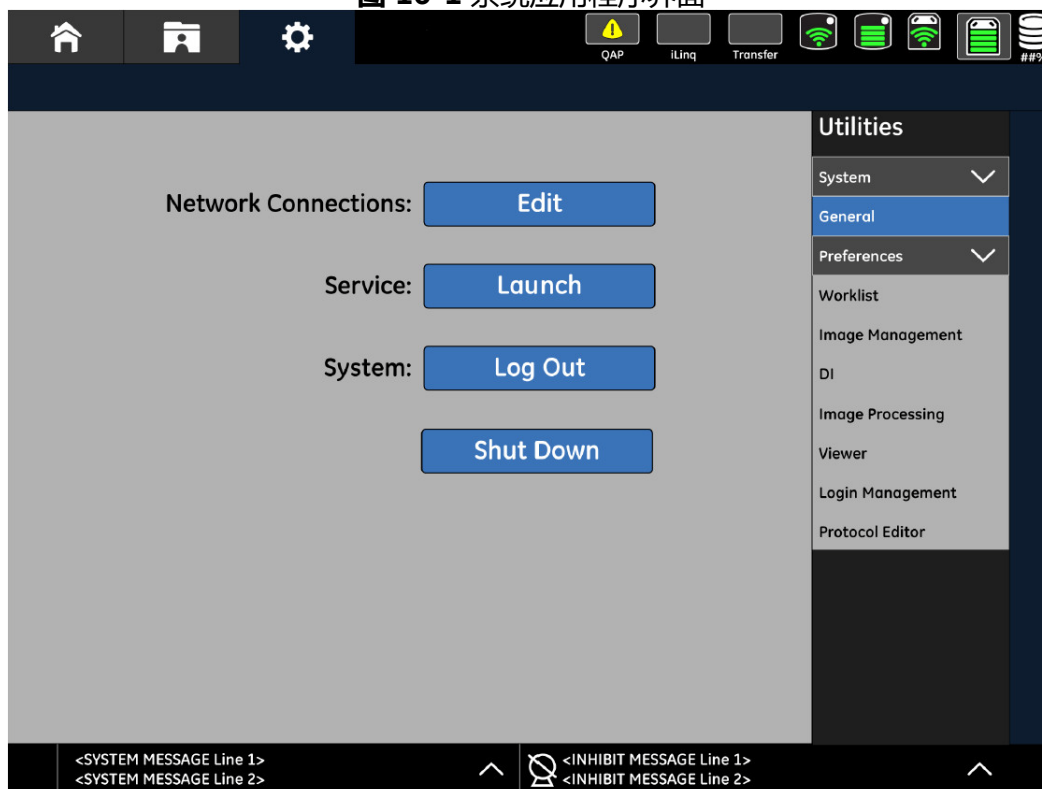
内容包括：

- 系统
  - 网络连接
  - 打印机
- 工作列表
  - 默认查询
  - 预设姓名
- 图像管理
  - 拷贝检查
  - 自动标记（质量检查）
  - 自动打印
  - 自动发送（自动发送）
  - 自动删除
- 图像浏览器
  - 预设注释

- DEI（探测器曝光指示器）
- 更改 DEI 显示
- 更改上限和下限
- 激活或失活技术模式
- 导出 DEI 日志
- 图像处理
  - 创建自定义风格
  - 为检查更改预设风格
  - 组织平衡概述
- 协议
  - 将协议数据库备份到 CD 上
  - 从 CD 上恢复协议数据库
  - 编辑协议数据库
  - 协议编辑器复制功能

系统

本部分为您设置网络连接和打印机连接系统参数提供指导。在这个界面上，您还可以使用维护、退出、关机功能。更多关于退出和关闭的信息，请参考第 5 章：常规信息。

图 16-1 系统应用程序界面

网络连接

通过应用程序系统 - 系统界面，可以配置网络连接与打印机连接。该界面允许合格的维修人员定义医学数字成像通讯（DICOM）发送目的地。

在该界面上，可添加、删除或编辑网络连接。

按以下步骤访问网络连接界面：

1. 在工作列表界面上点击 [应用程序] 按钮。

   ◆ 显示系统 - 系统界面。

2. 点击 [网络连接] 按钮。

   ◆ 显示网络连接界面（图 16-2）。