

MUSICA Acquisition Workstation

Getting Started Sheets

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Legal Notice



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DR workflow

The NX Workstation can be used with a DR system.

For this situation, there is a dedicated workflow to perform exposures.

Procedure:

1. Select the thumbnail for the exposure in the Image Overview pane of the Examination window.

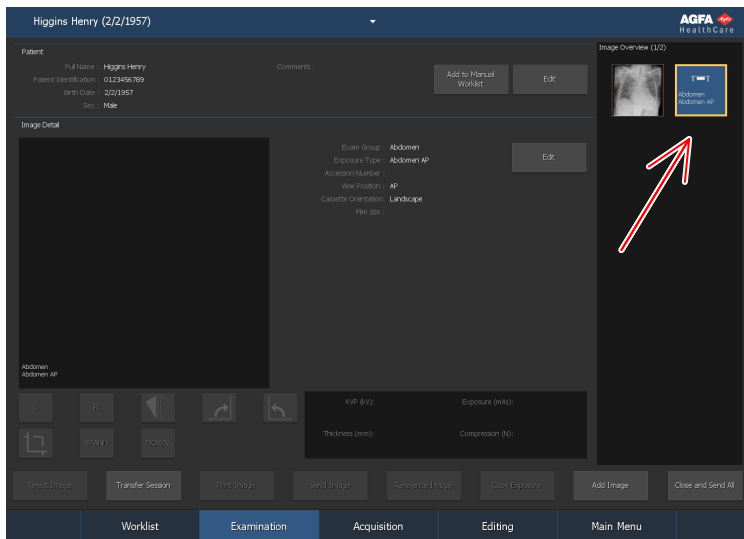


Figure 1: Examination Window with image thumbnail highlighted

The selected DR detector is activated.

The default X-Ray exposure parameters for the selected examination or exposure are sent to the modality.

Note that:

- If another thumbnail is selected before making the exposure, the newly selected DR detector is activated and the default X-Ray exposure parameters for that examination are sent to the modality, overruling the parameters sent previously.

If NX is configured in that way, the Forced Operator Identification window appears.



Figure 2: Forced Operator Identification window

2. In the Forced Operator Identification window, select a name from the list or enter your name and click OK.



Note: Operator Identification is only requested when you select the first thumbnail. If an examination is performed by several operators, you can adapt the "Operator" field in the Edit Image Detail pane (if this is configured). Refer to "Changing specific image settings".

3. Check the exposure settings.

- a) Check if the exposure settings displayed on the X-Ray System console are suitable for the exposure.
- b) If other exposure values are required than those defined in the NX exam, use the X-Ray System console to overwrite the default defined exposure settings.



Note: The default X-Ray exposure parameters can be used as a guide but the user must check and correct them if needed. The default X-Ray exposure parameters are defined in the NX Service and Configuration Tool. Refer to the Key User Manual for more information.



Note: You cannot change the X-Ray exposure parameters on the NX Software. This can only be done on the X-Ray System console.



Note: Refer to "Suggested Radiographic References and User Guides" for more information on determining default exposure parameters based on Target Exposure Index and desired image quality.

4. Position the patient and make the exposure.



CAUTION:

Do not select another thumbnail until the preview image is visible in the active thumbnail. The acquired image may be linked to the wrong exposure.



Note: The X-Ray exposure parameters before, during and after the exposure are displayed on the X-Ray System console.



Note: The X-Ray system position parameters before, during and after the exposure are displayed on the X-Ray System console or can be read from the X-Ray system controls.

After the exposure is made, the Examination window looks as follows:

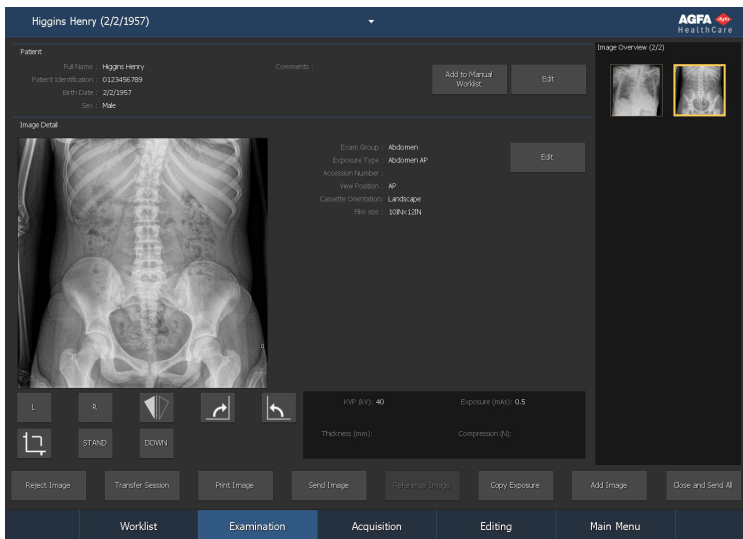


Figure 3: Examination window after making exposure on a DR Detector.

As a result:

- The image is acquired from the DR detector and displayed in the thumbnail.
 - If tube collimation is applied, the image is automatically cropped at the collimation borders.
 - The actual X-Ray exposure parameters are sent back from the modality to the NX Workstation.
 - The X-Ray exposure parameters (such as kV, mAs or DAP) are shown in the Image Detail pane of the Examination window. The list of shown parameters is to be configured.
5. The parameters are stored with the image.

Parameters can be sent with the image to the archive or printed with the image. They can also be sent out via MPPS.

DR workflow with fluoroscopy for positioning

This workflow is available only on DR systems that support dynamic imaging. Fluoroscopy can be used as a guide for positioning the patient before performing the planned exposure.

To use fluoroscopy for positioning:

1. Add a fluo group to the **Image Overview** pane.

If a fluo group has already been added based on data from the RIS, this step can be skipped.

- a) In the **Examination** window, click **Add Image**.

The **Add Image** window appears.

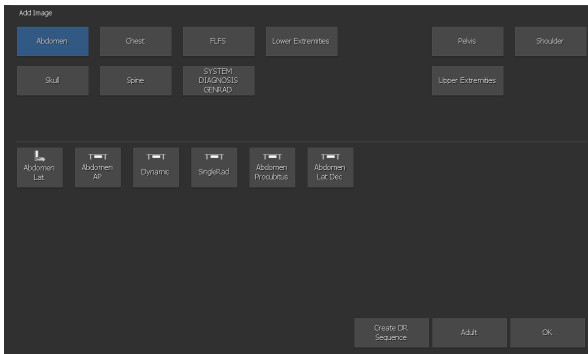


Figure 4: Add Image

- b) Specify the exam group and exam type by clicking on the buttons.
- c) Select an exam type that is configured as a fluo group and click **OK**.

The fluo group thumbnail is added to the **Image Overview** pane.

A fluo group thumbnail is indicated with an icon in the top right corner of the thumbnail.

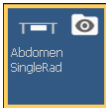


Figure 5: Thumbnail for a fluo group

2. Select the thumbnail for the fluo group in the **Image Overview** pane of the **Acquisition** window.

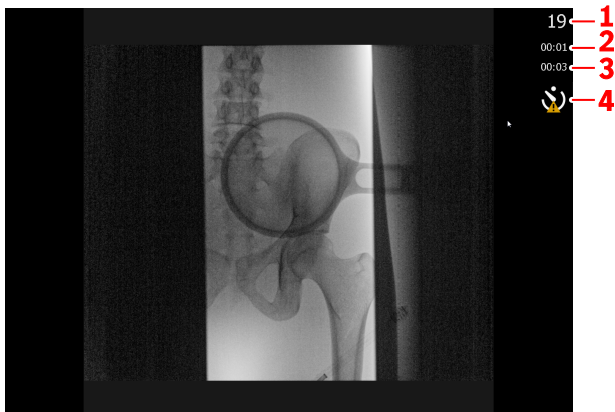
The selected DR detector is activated. The default X-ray exposure parameters and X-ray system position for the selected examination are sent to the modality.

3. Move the X-ray system to the right position.
4. Check the exposure settings.

The fluo group contains settings for fluoroscopy and for the static image.

5. Position the patient and verify the patient position using fluoroscopy.
 - a) Press and hold down the fluoroscopy pedal to view a real-time fluoroscopy image in the **Acquisition** window.

Information about the dynamic image is displayed next to the image.



1. Current frame number
2. Duration up till now of the current fluoroscopy exposure
3. Total duration up till now of all fluoroscopy exposures in this examination
4. Warning sign for delay on real-time imaging

Figure 6: Information about a dynamic image

A warning sign is displayed if the real-time imaging is delayed more than 200 msec on average during the last 2 seconds or if not all frames can be displayed.

- b) Release the fluoroscopy pedal to stop the fluoroscopy exposure.

The fluo sequence is stored and displayed as a fluo sequence thumbnail in the lower half of the **Image Overview** pane. The last image of the sequence is visible in the thumbnail.

A fluo sequence thumbnail is indicated with a transparent **Play** icon in the center.



Figure 7: Thumbnail of a fluo sequence

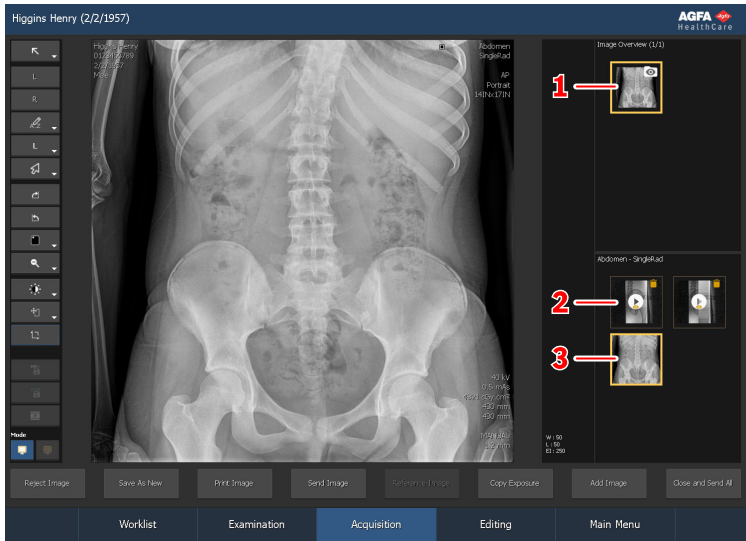
If required, multiple fluo sequences can be made.

6. Make the exposure.

Use the exposure button or the radiography pedal to make the planned exposure.

The image is acquired from the DR detector and displayed in a new thumbnail in the lower half of the Image Overview pane.

After the exposure is made, the Acquisition window looks as follows:



1. Fluo group thumbnail
2. Fluo sequence thumbnail
3. Image thumbnail

Figure 8: Result of the exposure

After making the exposure, no more fluo sequences or static images can be added to the fluo group.

7. Perform quality control.
8. If all images in the examination are OK, click **Close and Send All**.

If configured, the image is sent to the printer and/or PACS archive. The exam is placed in the **Closed Exams** pane.

Fluo sequences are not stored and not sent to a PACS archive. This is indicated by the yellow icon in the top right corner of the fluo sequence thumbnail. To store and archive a selected fluo sequence, click the **Store Sequence** button before clicking **Close and Send All**.

DR workflow for dynamic images

This workflow is available only on DR systems that support dynamic imaging.

To acquire a set of fluo sequences, rapid sequences and static images for diagnosis:

1. Add a dynamic group to the **Image Overview** pane.

If a dynamic group has already been added based on data from the RIS, this step can be skipped.

- a) In the **Examination** window, click **Add Image**.

The **Add Image** window appears.

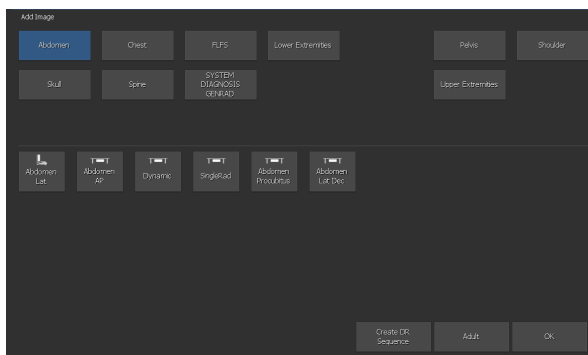


Figure 9: Add Image

- b) Specify the exam group and exam type by clicking on the buttons.
- c) Select an exam type that is configured as a dynamic group and click **OK**.

The dynamic group thumbnail is added to the **Image Overview** pane.

A dynamic group thumbnail is indicated with an icon in the top right corner of the thumbnail.

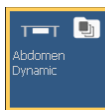


Figure 10: Thumbnail for a dynamic group

2. Select the thumbnail for the dynamic group in the **Image Overview** pane of the **Acquisition** window.

The selected DR detector is activated. The default X-ray exposure parameters and X-ray system position for the selected examination are sent to the modality.

3. Move the X-ray system to the right position.

4. Check the exposure settings.

The dynamic group contains settings for fluoroscopy, for rapid sequence and for a static image.

5. Position the patient.

6. Acquire a set of fluo sequences, rapid sequences and static images.

Information about the dynamic image is displayed next to the image.



1. Current frame number
2. Duration up till now of the current fluoroscopy or rapid sequence exposure
3. Total duration up till now of all fluoroscopy exposures in this examination
4. Warning sign for delay on real-time imaging

Figure 11: Information about a dynamic image

A warning sign is displayed if the real-time imaging is delayed more than 200 msec on average during the last 2 seconds or if not all frames can be displayed.

- Press and hold down the fluoroscopy pedal to view a real-time fluoroscopy image in the **Acquisition** window.

Release the fluoroscopy pedal to stop the fluoroscopy exposure.

The fluo sequence is stored and displayed as a fluo sequence thumbnail in the lower half of the **Image Overview** pane. The last image of the sequence is visible in the thumbnail

A fluo sequence thumbnail is indicated with a transparent **Play** icon in the center.



Figure 12: Thumbnail of a fluo sequence

If required, multiple fluo sequences can be made.

- Press and hold down the exposure button or the radiography pedal to make a rapid sequence exposure.

The rapid sequence mode must be selected in the **software console**.

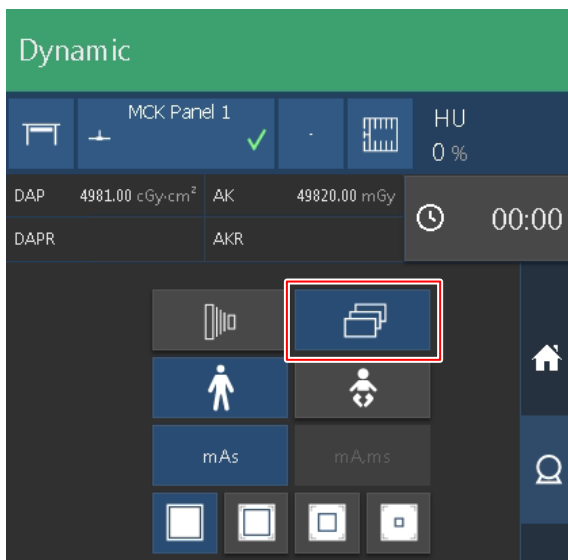


Figure 13: Rapid sequence mode

Release the exposure button or the radiography pedal to stop the fluoroscopy exposure.

The rapid sequence is stored and displayed as a rapid sequence thumbnail in the lower half of the **Image Overview** pane. The last image of the sequence is visible in the thumbnail.

A rapid sequence thumbnail is indicated with a white **Play** icon in the center.



Figure 14: Thumbnail of a rapid sequence

If required, multiple rapid sequences can be made.

- Press and hold down the exposure button or the radiography pedal to make an exposure to acquire a static image.

The static image mode must be selected in the **software console**.

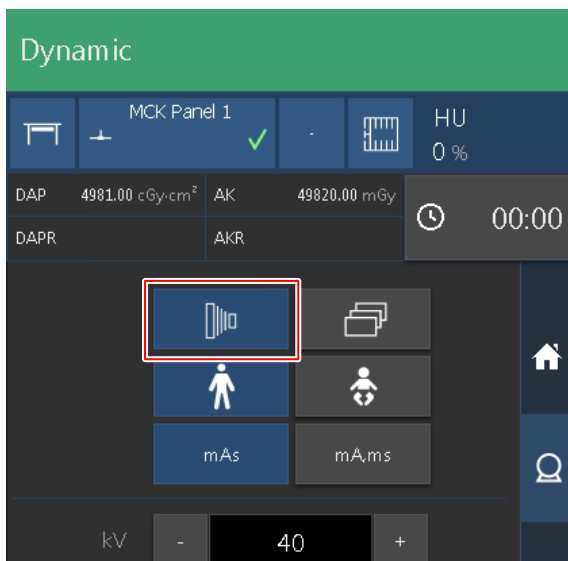


Figure 15: Static image mode

The image is stored and displayed as a thumbnail in the lower half of the **Image Overview** pane.



Figure 16: Thumbnail of a static image

If required, multiple static images can be made.

7. Perform quality control.
8. If all images in the examination are OK, click **Close and Send All**.

If configured, the static images and rapic sequences are sent to the printer and/or PACS archive. The exam is placed in the **Closed Exams** pane.

Fluo sequences are not stored and not sent to a PACS archive. This is indicated by the yellow icon in the top right corner of the fluo sequence thumbnail. To store and archive a selected fluo sequence, click the **Store Sequence** button before clicking **Close and Send All**.

Automated DR full screen sequence

A predefined sequence of DR exposures can be performed without having to return to the NX Workstation for each new exposure. During the automated workflow, the acquired images and the DR detector status are displayed full screen.

To start an automated DR full screen sequence:

1. In the **Examination** window, click **Add Image**.

The **Add Image** window appears.

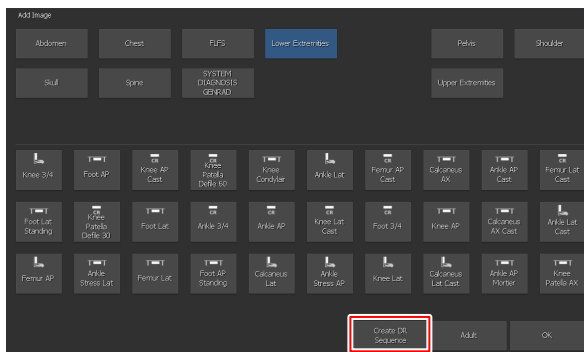


Figure 17: Create DR Sequence button

2. In the **Add Image** window, click the **Create DR Sequence** button.



Note: A predefined automated DR full screen sequence can be set up using the NX Service and Configuration Tool. Refer to the Key user manual for more information.

3. Add the exposures in the required order.

Images in a sequence are indicated with a small triangular mark in the lower left hand corner of the thumbnail. If an examination contains more than one sequence, the mark is alternating white and black to distinguish the sequences.



4. Select the thumbnail for the first exposure in the Image Overview pane and follow the normal DR workflow.

If configured, a positioning guidance image and guidance text for making the exposure is displayed.

After acquiring each image, the image is displayed in full screen mode and the next thumbnail is selected automatically. The color of the DR detector symbol indicates the status of the DR detector.

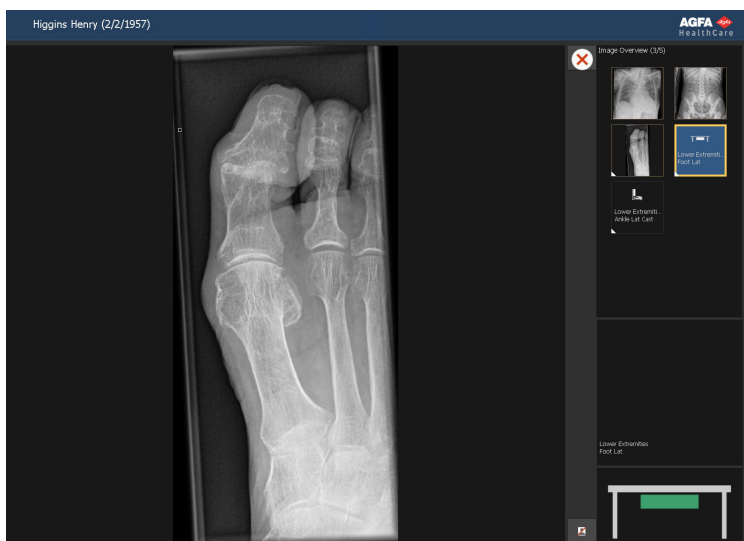


Figure 18: Examination window in full screen mode

5. After acquiring the last image, click the close button to leave full screen mode.


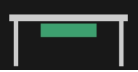



Figure 19: Close button

Topics:

- *DR detector status*
- *Rejecting an image during an automated DR full screen sequence*

DR detector status

Image	Description
	<p>Grey: The image is planned and the DR detector is in sleep mode.</p> <p>On a thumbnail that is not selected, the status indication is always grey.</p>
	<p>Green: The DR detector is ready to acquire the exposure on the selected acquisition system.</p> <p>Green flashing: The exposure has been performed and the acquisition is ongoing.</p>
	<p>Red: The DR detector is out of order.</p> <p>Red flashing: The selected acquisition system is starting up.</p>

Rejecting an image during an automated DR full screen sequence

The acquired image is displayed in full screen mode.

To reject this image:

1. Click the reject button.



Figure 20: Reject button

The **Reject Reason** dialog box opens.

2. Select a reason to reject the image.

The acquired image is rejected and a new thumbnail is added to the sequence.
The new thumbnail is selected for repeating the exposure.

CR workflow

Topics:

- *Identifying the cassettes*
- *Digitizing the images*

Identifying the cassettes

NX can be configured in such a way that different workflows are followed when identifying cassettes. You can configure NX to use one of these workflows in the NX Service and Configuration Tool.

- Identify a cassette using the ID Tablet. In short, the workflow goes as follows: selecting the thumbnail, inserting the cassette in the tablet and then clicking **ID**.
- Identify automatically using the ID Tablet ('Auto ID'). In short, the workflow goes as follows: selecting the thumbnail and inserting the cassette in the tablet. The ID label will automatically be added to the image and the thumbnail. Refer to the Key user manual, Device Configuration, section ID Tablets.
- Identify in the Digitizer ('Fast ID'). In short, the workflow goes as follows: selecting the thumbnail, inserting the cassette in the Digitizer and then clicking **ID**. Refer to the Key user manual, Device Configuration, section Digitizers.

Procedure:

1. Insert a cassette in the ID Tablet.
2. In the **Examination** window, select the right thumbnail in the Image Overview.

In the example below, there is only one thumbnail which is automatically selected. If there are more than one thumbnails, the selected one is not necessarily the one that will be performed first; you can select another thumbnail.

3. Click **ID** or press **F2**.

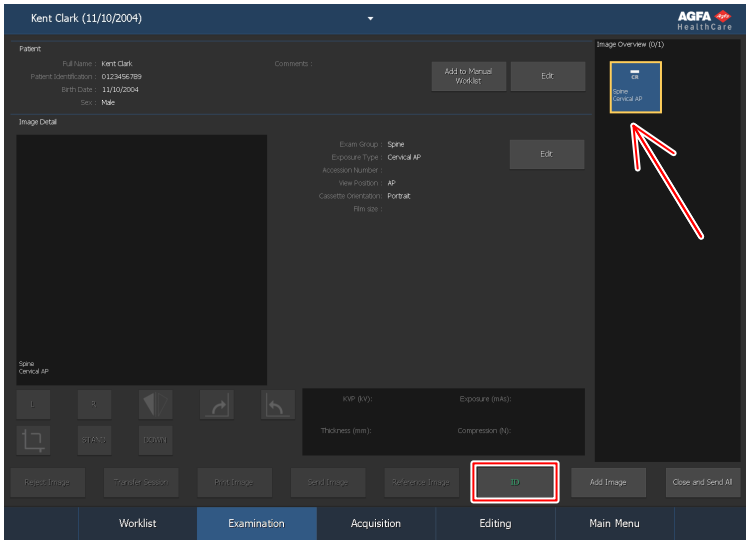


Figure 21: Examination window with thumbnail selected and ID button highlighted (cassette workflow).

If NX is configured in that way, the Forced Operator Identification window appears.



Figure 22: Forced Operator Identification window

4. In the Forced Operator Identification window, select a name from the list or enter your name and click **OK**.



Note: Operator Identification is only requested when you identify the first thumbnail. If an examination is performed by several operators, you can adapt the “Operator” field in the Edit Image Detail pane (if this is configured). Refer to “Changing specific image settings”.

5. The thumbnail is labelled with the code ‘ID’. The patient data is written to the cassette.

Depending on the configuration, the next exposure thumbnail to be identified is now selected.



Note: The identification of the cassette can be performed before or after the X-Ray exposure. Refer to “Identifying a cassette” for alternative identification procedures.



Note: You can also identify cassettes in the Add image window.

Digitizing the images

Procedure:

1. Insert the cassette in the Digitizer.
2. The image will appear in the **Image Overview** pane of the **Examination** window.

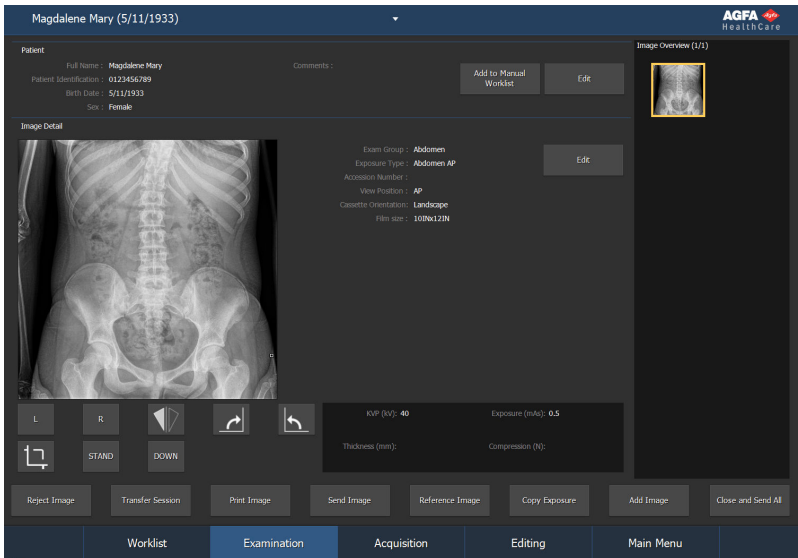


Figure 23: Image appears in Examination window

CR workflow with X-Ray generator control

The NX Workstation can be connected to the X-Ray System Generator to exchange X-Ray exposure settings. This functionality is license-dependent. For this situation, there is a dedicated workflow: identification of the cassettes is performed each time after making the exposure. The other aspects of using the Examination window remain the same as described elsewhere in this chapter.

This workflow also applies when performing a CR exposure on an NX Workstation that is part of a DR system.

Procedure:

1. Select the thumbnail for the exposure in the Image Overview pane of the Examination window.

The default X-Ray exposure parameters for the selected examination or exposure are sent to the modality.

Note that:

- If another thumbnail is selected before making the exposure, the default X-Ray exposure parameters for that examination are sent to the modality, overruling the parameters sent previously.

2. Check the exposure settings.

- a) Check if the exposure settings displayed on the X-Ray System console are suitable for the exposure.
- b) If other exposure values are required than those defined in the NX exam, use the X-Ray System console to overwrite the default defined exposure settings.



Note: The default X-Ray exposure parameters can be used as a guide but the user must check and correct them if needed. The default X-Ray exposure parameters are defined in the NX Service and Configuration Tool. Refer to the Key User Manual for more information.



Note: You cannot change the X-Ray exposure parameters on the NX Software. This can only be done on the X-Ray System console.



Note: Refer to "Suggested Radiographic References and User Guides" for more information on determining default exposure parameters based on Target Exposure Index and desired image quality.

3. Insert the cassette in the modality, position the patient and make the exposure.

As a result:

- The actual X-Ray exposure parameters are sent back from the modality to the NX Workstation.
 - The X-Ray exposure parameters (such as kV, mAs or DAP) are shown in the Image Detail pane of the Examination window (1). The list of shown parameters is to be configured.
 - A green OK mark appears on all thumbnails for which the exposures are made and for which exposure settings are sent back to the NX Workstation (2).
4. Insert the cassette in the digitizer or in the ID Tablet and click ID in the Examination window.



CAUTION:

Do not select another thumbnail until the preview image is visible in the active thumbnail. The acquired image may be linked to the wrong exposure.



Note: The X-Ray exposure parameters before, during and after the exposure are displayed on the X-Ray System console.



Note: The X-Ray system position parameters before, during and after the exposure are displayed on the X-Ray System console or can be read from the X-Ray system controls.

5. The parameters are stored with the image.

Parameters can be sent with the image to the archive or printed with the image. They can also be sent out via MPPS.



Note: You cannot change the default parameters on the NX Workstation. This can only be done on the console. Also, after the exposure is made, parameters cannot be changed on the NX Workstation. They can only be consulted in the Examination window.

Making multiple exposures on a single cassette

If an image thumbnail is configured for multiple exposures on a single cassette, another set of thumbnails is shown in the image detail pane. Now

you have to select one of these thumbnails to send the proper default X-Ray exposure parameters to the modality for each exposure.

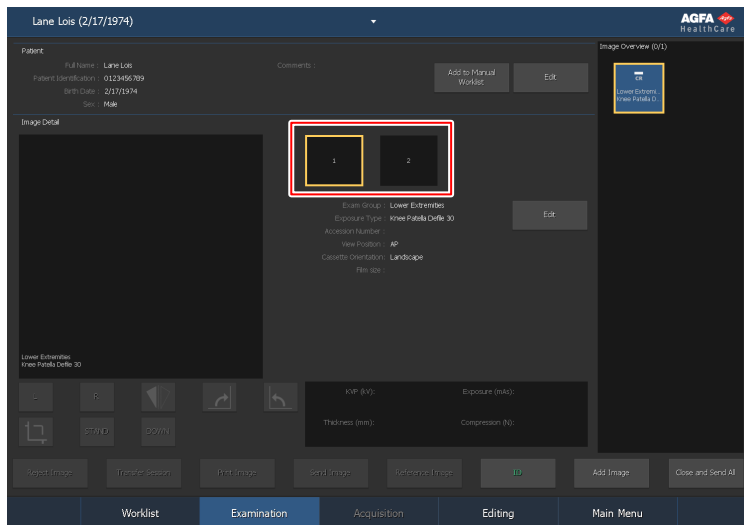


Figure 24: Multiple Exposures on same cassette shown in Examination window.



CAUTION:

Incomplete exposure parameters (kV, mAs) are transmitted to Archive for multiple sub-exposures on one cassette. Only the exposure parameters for one sub-exposure are transmitted. Don't use multiple sub-exposures when the exposure parameters are interpreted by the Archive.

Mammography CR workflow with a connection to the X-Ray generator

The NX Workstation can be connected to the Mammography X-Ray System Generator to exchange X-Ray exposure settings. This functionality is license-dependent.

For this situation, there's a dedicated workflow to identify cassettes: ID one by one workflow is the workflow custom to users that use an ID camera connected to the modality in a film/screen environment.

Procedure:

1. Insert the cassette into the modality, position the patient and make the exposure.
2. Remove the cassette from the table and insert the next cassette.
3. Select the correct thumbnail in the exam overview pane
4. Insert the cassette in the Tablet and click ID in the Examination window. This will link the received exposure settings to the image.
5. Insert the cassette in the Digitizer.
6. Reposition the patient.
7. Make the next exposure.
8. Repeat from 2 until all exposures are made.

Estimated Radiographic Magnification Factor (ERMF)

Mammography images are calibrated based on the Estimated Radiographic Magnification Factor. The calibration factor is received together with the X-Ray generator parameters.

Modifying the Estimated Radiographic Magnification Factor is only possible if the Source Image Distance (SID) is received together with the X-Ray generator parameters.

Mammography CR workflow with manual entry of X-Ray exposure parameters

The NX workstation can be used to enter X-Ray exposure data manually in a mammography workflow.

This functionality is license-dependent. It cannot be used in combination to the X-Ray Device exchanging exposure settings.

The key user has to configure NX so that the X-Ray parameter fields are visible in the NX Image Detail pane.



Note: X-Ray parameters can be updated before the image is archived, printed, sent or rejected.

Procedure:

1. Insert the cassette into the table and position the patient.
2. Make the exposure.
3. Remove the cassette from the table and insert the next cassette.
4. Select the correct thumbnail in the exam overview pane.
5. In the Image Detail pane, enter the X-Ray parameters.
6. Insert the cassette in the Tablet and click ID in the Examination window. This will link the entered exposure settings to the image.
7. Insert the cassette in the Digitizer.
8. Reposition the patient.
9. Make the next exposure.
10. Repeat from 3 until all exposures are made.

Estimated Radiographic Magnification Factor (ERMF)

To apply a calibration based on the Estimated Radiographic Magnification Factor

1. Enter the Source Image Distance (SID) in the X-Ray generator parameters.
2. Enter the distance between the plane in which measurements are to be made and the detector.