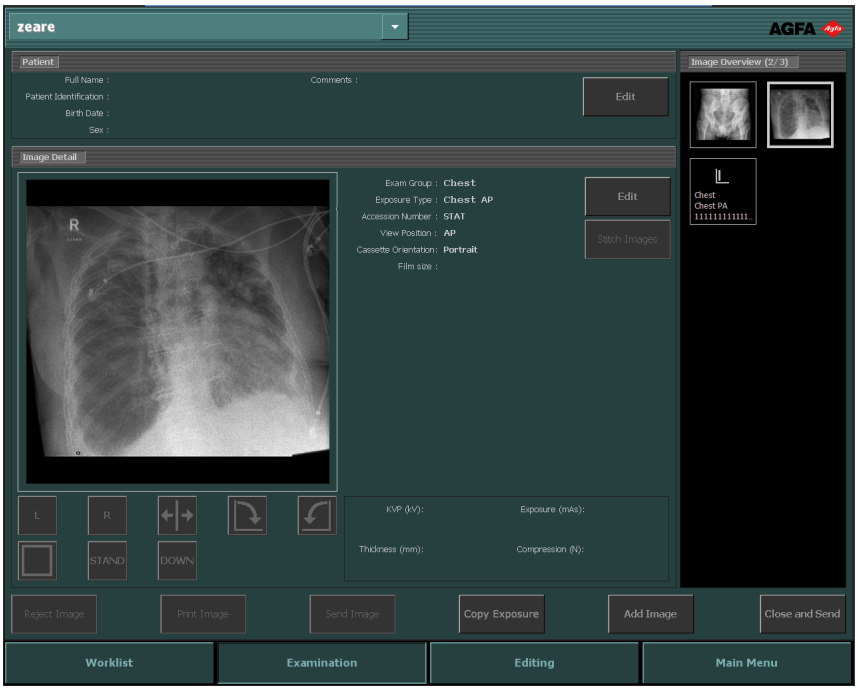
NX

User Manual



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AGFA HealthCare

Contents

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Agfa HealthCare NV, Septestraat 27, B-2640 Mortsel - Belgium

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Introduction to this manual

Topics:

Scope of this Manual

This manual contains information for the safe and effective operation of AGFA Healthcare products.

About the safety notices in this document

The following samples show how warnings, cautions, instructions and notes appear in this document. The text explains their intended use.

DANGER:
A danger safety notice indicates a hazardous situation of direct, immediate danger for a potential serious injury to a user, engineer, patient or any other person.

WARNING:
A warning safety notice indicates a hazardous situation which can lead to a potential serious injury to a user, engineer, patient or any other person.

CAUTION:
A caution safety notice indicates a hazardous situation which can lead to a potential minor injury to a user, engineer, patient or any other person.

An instruction is a direction which, if it is not followed, can cause damage to the equipment described in this manual or any other equipment or goods and can cause environmental pollution.

A prohibition is a direction which, if it is not followed, can cause damage to the equipment described in this manual or any other equipment or goods and can cause environmental pollution.

Note: *Notes provide advice and highlight unusual points. A note is not intended as an instruction.*

Disclaimer

Agfa assumes no liability for use of this document if any unauthorized changes to the content or format have been made.

Every care has been taken to ensure the accuracy of the information in this document. However, Agfa assumes no responsibility or liability for errors, inaccuracies or omissions that may appear in this document. To improve reliability, function or design Agfa reserves the right to change the product without further notice. This manual is provided without warranty of any kind, implied or expressed, including, but not limited to, the implied warranties of merchantability and fitness for a particular purpose.

Note: *In the United States, Federal law restricts this device to sale by or on the order of a physician.*

Introduction to NX

Topics:

Intended Use

Topics:

NX Modality Workstation

- Agfa's NX workstation is indicated for use in general projection radiographic applications for the display of diagnostic quality radiographic images of human anatomy for adult, pediatric and neonatal examinations captured from DR and CR systems. The NX system in combination with the DR detectors and CR digitizers may be used wherever conventional screen-film systems, CR or DR systems may be used.
- The NX workstation is also indicated for use in mammography applications in combination with specific cleared CR mammography digitizers. The NX workstation is not indicated for use for mammography in combination with non-cleared CR digitizers or DR detectors.
- NX Modality Workstation is a CR/DR workstation for image acquisition, identification, image processing and image transmission of digitized images received from an Agfa digitizer or Agfa validated DR Panel.
- The primary use of the NX Modality workstation is quality monitoring. With the additional diagnostic monitor, images are displayed with diagnostic quality. There is however no extensive toolset for softcopy reading available.
- NX Modality Workstation is intended for linking patient and study data to CR/DR images and for preparing these images for diagnostic use and sending them to a printer, an archive or a diagnostic station or burning them on CD/DVD.
- Study- and patient data are retrieved from a RIS or entered manually. Study- and patient data can be edited.
- Identification is done using well defined identification procedures.
- NX Modality Workstation provides XRG connectivity for setting and getting of XRG parameters.
- NX Modality Workstation provides tools to improve image quality of the medical images and to predefine image processing settings.
- NX Modality Workstation is not intended to be used as an archive.
- NX Modality Workstation can be used in Radiotherapy as well, although no special Radiotherapy tools, features or functionalities are provided.
- NX Modality Workstation can be used in mixed environments which include CR/DR General Radiology and CR Mammography environments.

Note: *All functionality is available depending on regional or country-releases and compliance to local regulations.*

NX Central Monitoring System

- NX Central Monitoring System is a CR/DR workstation for image processing and image transmission of digitized images created on NX Modality Workstations.
- The primary use of the NX Central Monitoring System is quality monitoring. With the additional diagnostic monitor, images are displayed with diagnostic quality. There is however no extensive toolset for softcopy reading available.
- NX Central Monitoring System is intended for preparing images for diagnostic use and sending them to a printer, an archive or a diagnostic station or burning them on CD/DVD.
- NX Central Monitoring System can be used to view and improve the images acquired and processed by NX Modality Workstations
- NX Central Monitoring System can be used to monitor CR/DR imaging from a central location.
- Study- and patient data can be edited.
- NX Central Monitoring System provides tools to improve image quality of the medical images and to predefine image processing settings.
- NX Central Monitoring System is not intended to be used as an archive.

NX Office Viewer

- NX Office Viewer is a software application for viewing digitized images acquired and processed by an NX Modality Workstation. The application can be installed on any PC complying with the minimum requirements.
- Display image quality depends on the connected monitor. With the additional diagnostic monitor images are displayed with diagnostic quality, however no extensive toolset for softcopy reading is foreseen.
- With NX Office Viewer you can change the presentation of images but these changes cannot be saved.
- NX Office Viewer can be used to print images on an office type printer in non-diagnostic quality.
- NX Office Viewer can be used to export images to hard disk in non-diagnostic quality.
- NX Office Viewer is not intended to be used as an archive.

Note: *All functionality is available depending on regional/country releases and/or compliance to local regulations.*

Intended User

This manual is written for trained users of Agfa products and trained diagnostic X–Ray clinical personnel.

Users are considered as the persons who actually handle the equipment as well as the persons having authority over the equipment.

Before attempting to work with this equipment, the user must read, understand, note and strictly observe all warnings, cautions and safety markings on the equipment.

Before attempting to work with this equipment, the user must thoroughly read and fully understand this manual and any release notes delivered with the software media pack, paying particular attention to all warnings, cautions and notes.

Configuration

An NX workstation can be part of two types of configurations:

- An NX workstation can act as a stand-alone workstation for in-room identification of examinations and quality control of examinations. In this situation, an ID Tablet and/or an in-room Fast ID Digitizer are connected to the NX workstation. The NX configuration can include one or more DR detectors, connected to the NX workstation.
- An NX Workstation can also be part of a Central Monitoring System configuration. In that case, the in-room configuration is extended in such way that a number of in-room NX workstations are connected to one or more Central Monitoring Systems.

It is possible to view the images on the NX workstations from any other PC using the NX Office Viewer software.

Operation Controls

NX is designed to perform sequential tasks in three different environments (the Worklist, Examination and Editing environment), following the hospital workflow of identifying examinations, performing examinations and performing additional editing tasks:

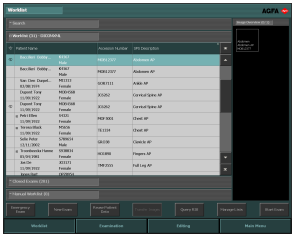


Figure 1: Worklist environment

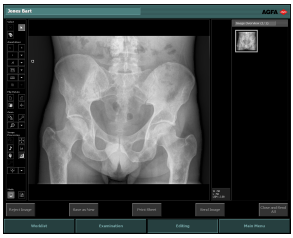
The user can:

- Control the identification workflow in the radiology department.
- Identify examinations using RIS-based worklists.
- Perform multiple exams at the same time.
- Perform emergency exams, without selecting RIS data for identification.

Figure 2: Examination environment

The user can:

- Define examinations you want to perform (select exposures for an examination, edit patient data).
- Judge if the images are taken correctly.
- Take steps to prepare the images for diagnosis.
- Control the flow of examinations to other external components (such as an archive).



The user can use an extensive range of image processing functions, including annotations and applying manual collimation.

Figure 3: Editing environment

Other features:

- NX offers the possibility to re-process images which have been associated with wrong study parameters during identification. This feature eliminates the need to retake exposures.
- NX offers automatic processing functions including automatic image processing (Agfa MUSICA(2) processing), automatic window/level adjustment and automatic collimation border detection.

System Documentation

The NX documentation consists of the following manuals:

- NX User manual (this manual) (document 4420).
- NX Key User manual (document 4421).
- NX Central Monitoring System user manual (document 4426).
- NX Getting Started Folder (document 4417).
- NX Getting Started Sheets (document 4424).
- NX Problem Solving Sheets (document 4425).
- CR Mammography System User manual (document 2344).
- FLFS Option for NX User manual (document 4408).
- NX Office Viewer Installation Manual (document 4429).
- Getting Started with NX Office Viewer (document 4430).
- NX Online Help Documentation.

The documentation is delivered on a DVD together with the NX software and is accessible on the system in an online help system.

The documentation shall be kept with the system for easy reference. Technical documentation is available in the product service documentation that is available from your local support organization.

Opening the NX help system

1. Go to the **Main Menu** window.
2. Click the **Help** action button.

   The NX help Welcome screen appears:

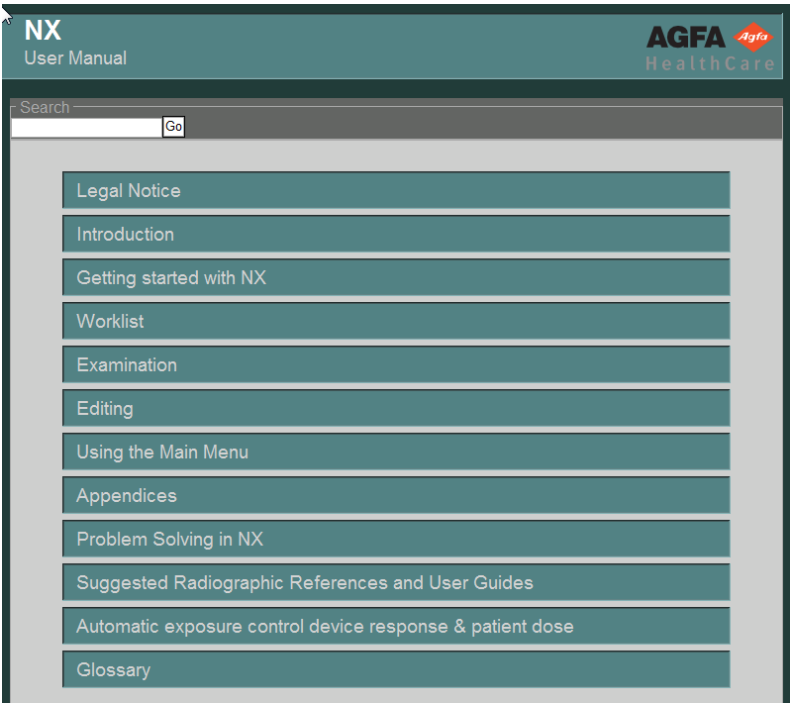


Figure 4: NX Online help Welcome screen

Options and Accessories

Optional licenses can hide or show certain functionality, depending on if they are enabled or not.

NX has a base license (of which the main goal is to identify cassettes and view the images) with several additional product licenses, adding functionality like advanced annotation tools or advanced quality assurance tools.

Training

The user must have received adequate training on the safe and effective use of the software before attempting to work with it. Training requirements may vary from country to country. The user must make sure that training is received in accordance with local laws or regulations that have the force of law. Your local Agfa representative can provide further information on training.

The user must note the following information in the previous section of this manual:

- Intended Use.
- Intended User.
- Safety Directions.

Product Complaints

Any health care professional (for example a customer or a user) who has any complaints or has experienced any dissatisfaction with the quality, durability, reliability, safety, effectiveness, or performance of this product must notify Agfa.

If the device malfunctions and may have caused or contributed to a serious injury of a patient, Agfa must be notified immediately by telephone, fax or written correspondence to the following address:

Agfa Service Support - local support addresses and phone numbers are listed on www.agfa.com Agfa - Septestraat 27, 2640 Mortsel, Belgium Agfa - Fax +32 3 444 7094

Compatibility

NX must only be used in combination with other equipment, components or software that have been expressly recognized by Agfa as compatible.

Any change or addition to the equipment can only be done after prior formal approval of Agfa HealthCare. Changes or additions to the equipment must only be carried out by persons authorized to do so by Agfa. Such changes must comply with the best engineering practice and all applicable laws and regulations that have the force of law within the jurisdiction of the customer.

Any changes or additions to the equipment without the approval of Agfa falls under the sole responsibility of the customer and Agfa cannot guarantee proper functionality of the third party software or the Agfa software after installation. The customer shall hold harmless and indemnify Agfa for and against any loss, liability, costs, claims and expenses asserted against Agfa or incurred by Agfa arising out of or in connection with this addition.

Any upgrade of Agfa software may impact the behaviour of third party software.

Compliance

NX has been designed in accordance with the MEDDEV Guidelines relating to the application of Medical Devices and has been tested as part of the conformity assessment procedures required by 93/42/EEC MDD (European Council Directive 93/42/EEC on Medical Devices).

This Agfa product has been designed in accordance with the IEC 60601-1, Ed. 3: Medical electrical equipment - Part 1: General requirements for basic safety and essential performance

Both the workstation console and the ID Tablet comply with the following safety standards:

- UL 1950, Third Edition.
- CAN/CSA 22.2 No. 950-95, Third Edition (cUL).
- EN60950 (TÜV).
- TÜV.

The equipment bears the CE mark and fully complies with the CE Directive 89/336/EEC and with the federal code of the United States, bearing on:

- Emission and immunity according to EN 60601-1-2, for emissions the equipment complies with EN 55011 class A (CISPR 11). This is a Class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.
- Emissions according to 47 CFR part 15 subpart B, Class A. This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the Instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.
- Radio-parameters according to ETS 300330.

Performance

NX is designed to meet the following performance requirement:

- The maximum storage capacity of an NX workstation is 16 800 18x24cm images or 30 000 images using extended storage. Depending on cassette sizes and the digitizer type, this can be less. The number of images stored can be limited by local configuration. Increasing the number of images stored will increase searching time for images.
- The maximum throughput of an NX system is 180 images/hour. Depending on Digitizer type and image size this can be less.

Connectivity

The NX workstation requires a TCP/IP network to exchange information with a number of other devices. The recommended minimum network performance is 100 Mbit for wired ethernet and IEEE 802.11 g for wireless network. NX is provided with a mechanism to prevent data loss on network failure.

CAUTION:
A wireless network operating on variable speed or having interruptions will cause delays on the NX workstation.

Note: *NX Central Monitoring System and NX Office Viewer do not support wireless network.*

NX communicates with other devices in the hospital network using one of the following protocols:

NX is Service Class User of these DICOM SOP Classes:

SOP Class
Verification SOP Class
Storage Commitment Push Model SOP Class
Modality Performed Procedure Step Sop Class
Computed Radiography Image Storage
Digital X-Ray Image Storage – For Presentation
Digital X-Ray Image Storage – For Processing
Digital mammography X-Ray Image Storage - For Presentation
Digital mammography X-Ray Image Storage - For Processing
Grayscale Softcopy Presentation State Storage SOP Class
Modality Worklist Information Model – FIND
Basic Grayscale Print Management Meta SOP Class • Basic Film Session SOP Class • Basic Film Box SOP Class • Basic Grayscale Image Box SOP Class

SOP Class
• X-Ray Radiation Dose SR
Printer SOP Class
Optional print SOP classes: • Print Job SOP Class • Presentation LUT SOP Class

IHE:

Integration Profiles Implemented	**Actors Implemented**	**Options Implemented**
Scheduled Workflow	Acquisition Modality	• Broad Worklist Query • PPS Exception Management • Billing and Material Management
Patient Info Reconciliation	Acquisition Modality	none
Consistent Presentation of Images	Acquisition Modality	none
	Print Composer	none
Basic Security Integration	Acquisition Modality	none
	Secure Node	none
ATNA	Acquisition Modality	none
	Secure Node	
Portable Data for Imaging	Portable Media Creator	none
Mammo Integration Profile	Acquisition Modality	• partial view option • web-viewable content option
Radiation Exposure Monitoring (REM)	Acquisition Modality	none

Integration Profiles Implemented	Actors Implemented	Options Implemented
Dose Structured Reporting Profile	Acquisition Modality	none

Installation

Topics:

Installation responsibilities

NX installation and configuration is performed by Agfa. A limited number of configuration tasks can also be performed by the customer after an Agfa training course has been provided. Contact your local support organization for more information.

Installation and configuration is described in the NX Service Documentation, which is available to the support personnel of Agfa.

Installation of the NX Office Viewer software is performed by the user. Installation instructions are available in NX Office Viewer Installation Manual (doc 4429).

Patient environment

The NX Workstation complies with the UL 60950 / EN 60950 standard for Information Technology. This means that, although it is absolutely safe, patients may not come into direct contact with the equipment. Therefore, the workstation must be placed outside a radius of 1.5 m (EN) or 1.83 m (UL/CSA) around the patient (according to the local valid regulation).

Licensing dongle

The availability of the NX software depends on the license dongle to be connected to the PC. Agfa advizes not to remove the dongle, even if the NX software is not being used, because this will consume the “license grace period”. The grace period is a limited period of time during which you can continue working if the dongle is accidentally removed or lost.

To remove the dongle without consuming this license grace period, open the License Manager tool (Start > Agfa > Service > License Manager) and disable the option “Enable grace functionality”. This may be useful if NX is installed on a laptop, used for other purposes. To use NX, the dongle must be plugged in. If the dongle gets broken or lost, the licenses will be immediately blocked and you must open the License Manager tool and click “Enable grace functionality” to continue working for a limited period of time, during which the dongle can be replaced.

Messages

Under certain conditions NX will show a dialog box in the middle of the screen containing a message. This message will tell that either a problem has occurred or that a requested action cannot be performed.

The user must read these messages carefully. They will provide information on what to do from then on. This will be either performing an action to resolve the problem or to contact the Agfa service organization.

Details on the contents of messages can be found in the service documentation which is available to Agfa service personnel.

Labels

NX has an About box, showing information on version and release of NX.

Mention this version number if you contact Agfa for support.

Consulting the About box

1. Click **About NX...** in the Tools section of the Main Menu window.

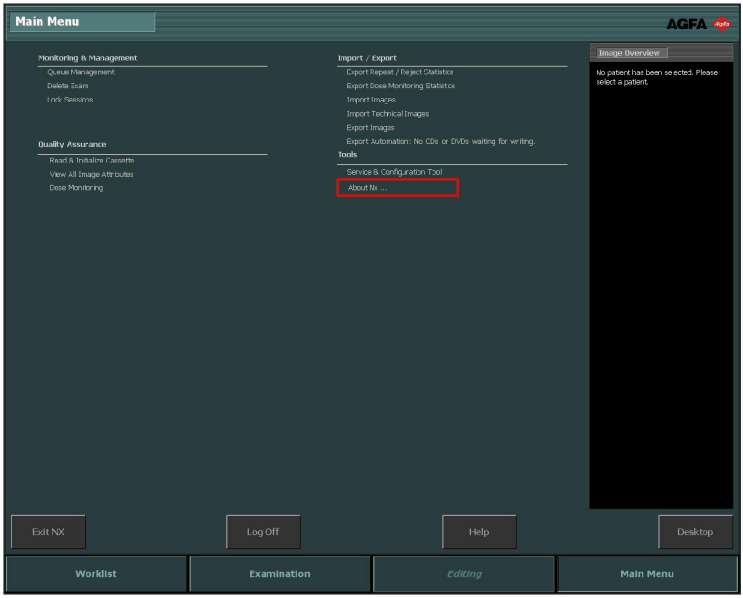


Figure 5: Main Menu window.

This will open the About box showing the current release and version details of NX in the lower right corner.

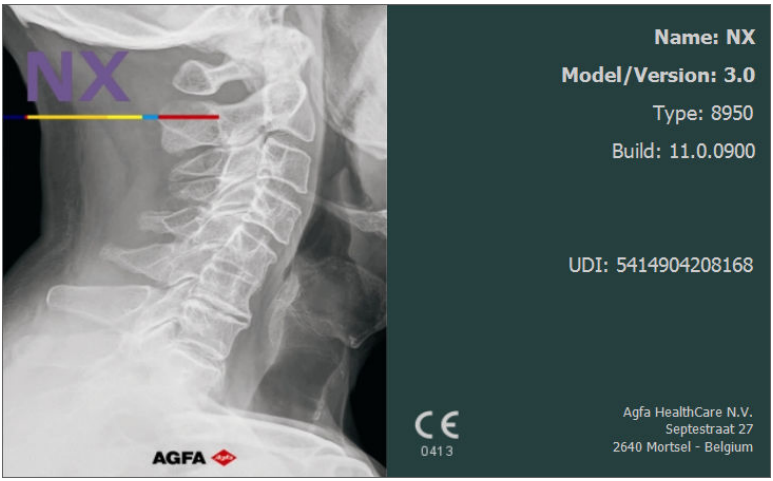


Figure 6: NX About box (Displayed data may be different).

Note: Always quote these details when you discuss any issues with Agfa service personnel.

2. Click on the dialog to close it.

Patient data security

It is the responsibility of the hospital to ensure that the patients' legal requirements are met and that the security of the patient records is:

- maintained and tested,
- audited,
- administered locally to cover risks from third party access and
- how the availability of the services is to be maintained in the event of disaster.

It is the responsibility of the hospital to ensure that types of access are identified and classified and that reasons for access are justified.

Increased security: HIPAA

Within the healthcare industry, several standardization efforts are ongoing as a response to Privacy and Security legislation and regulations. The purpose of this standardization for hospitals and vendors is to enable information sharing, interoperability and to support the workflow of hospitals in a multiple vendor environment.

In order to allow hospitals to comply to HIPAA regulations (Health Insurance Portability and Accountability Act) and meet the IHE standards (Integrated Healthcare Enterprise) security features are included in NX:

- User authentication. The administrator can configure different user accounts. Each account consists of a user name and a password. Refer also to "Patient data security". However, the system login is used for user authentication and identification. No application login is required.
- Audit logging. This implies logging to a central log server of specific NX 'actions', e.g. start-up/shutdown and user authentication failures. The logging tool is not part of NX. The customer should provide it.
- Node authentication, using certificates. Working with SSL (Secure Sockets Layer) allows secure communications on an insecure network. SSL is the security layer on top of TCP/IP.

Note: *Configuring security settings is done in the NX Service and Configuration Tool. Refer to the Key user manual for more information.*

Maintenance

Topics:

Automatic storage management

NX is equipped with an automatic storage management system. The number of days examinations remain on disk can be configured. If there is less space available than required for storing 200 images, the oldest examinations are deleted until there is enough capacity for at least 200 images.

Only closed examinations can be deleted, with an exception of locked examinations and examinations created in the last 24 hours.

Preventive maintenance indicator

An NX Workstation that is part of a DR system can be configured to indicate to the user when preventive maintenance of the DR system is required, after a specific time interval or a number of DR exposures. The message is displayed at the bottom right corner of the screen and can be clicked away. Contact your local support organization for more information.

Safety Directions

WARNING:
Safety is only guaranteed when an Agfa certified field service engineer has installed the product.

WARNING:
Diagnosis cannot be performed on NX if the workstation has no appropriate diagnostic monitor.

WARNING:
To perform diagnosis on NX, additional diagnostic input may be required.

WARNING:
The user is responsible for judging image quality and controlling environmental conditions for diagnostic softcopy or print viewing.

WARNING:
A software algorithm error leading to an image processing failure can cause loss of diagnostic information.

WARNING:
A configuration error leading to an image processing failure can cause loss of diagnostic information.

WARNING:
The user must follow the hospital quality assurance procedures for covering the risks resulting from errors in the image processing

WARNING:
The user must be aware when selecting patient data and identifying cassettes. Mistakes may lead to incorrect patient/ study relation or bad image quality.

WARNING:
The following actions may lead to serious risk of injury and damage to the equipment as well as making the warranty void:

Changes, additions or maintenance to the Agfa products carried out by persons without appropriate qualifications and training.

Using unapproved spare parts

WARNING:
Improper changes, additions, maintenance or repair of the equipment or the software can lead to personal injury, electrical shock and damage to the equipment. Safety is only guaranteed when changes, additions, maintenance or repairs are carried out by an Agfa certified field service engineer. A non certified engineer performing a modification or service intervention on a medical device, acts on his own responsibility and makes the warranty void.

CAUTION:
Strictly observe all warnings, cautions, notes and safety markings within this document and on the product.

CAUTION:
All Agfa medical products must be used by trained and qualified personnel.

CAUTION:
Oldest examinations will be deleted automatically by the automatic storage management system. The NX Workstation may not be used as an archive.

CAUTION:
Automatic adjustment of image density may hide occasional or systematic overexposure.

CAUTION:
The image processing masks systematic over-exposure. Use correct exposure settings and do not rely on the image appearance to judge exposure level.

CAUTION:
To avoid images being lost due to a power failure, the workstation and the Digitizer have to be connected to uninterruptable power supply (UPS) or an institutional standby generator. In case of a power failure, the UPS will allow to finalize exposed images that are being scanned.

CAUTION:
Do not position the NX workstation so that it is difficult to disconnect the mains power connection.

Note: *Every reasonable precaution has been taken during the manufacturing of NX to safeguard the health and safety of persons who will operate this system. Cautions, warnings and notes must be observed at all times.*

Topics:

Safety precautions concerning identification

For configurations with ID Tablet following safety precaution applies:

Pull the power plug out of the equipment prior to cleaning the equipment.

Safety precautions concerning Full Leg Full Spine functionality

The composite, stitched image which results from the image stitching process of the Full Leg Full Spine option is compressed. Furthermore, technical acquisition factors vary greatly with Full Leg Full Spine imaging; for example, a Full Leg Full Spine image may be intentionally acquired with low dose or no anti-scatter grid to reduce exposure to a pediatric patient.

The resulting image quality is generally suboptimal for most skeletal studies when compared to normal computed radiographic techniques. The composite, stitched image is created to allow accurate softcopy measurement of distances and angles by qualified medical practitioners. Any incidental clinical findings that are seen on the source or stitched images, beyond the scope of measurements of angles and distances between skeletal entities, should be verified or further evaluated by additional diagnostic methods.

The Full Leg Full Spine stitching function cannot be used if the Full Leg Full Spine exposure type is not selected for a certain image. Another prerequisite is an activated Full Leg Full Spine license.

Selecting the Full Leg Full Spine exposure type for identifying images helps reducing the width of the stitching gap for composed images. If images come in with this exposure type and the images are stitched to a Full Leg Full Spine image, they can benefit of this feature. Also participating in reducing the stitching gap is the use of FLFS cassettes.

The presence of a white stitching line however has no influence on the accuracy of the measurements performed on the stitched image. Yet this can influence the visibility of reference measurement points, therefore Agfa advises the use of FLFS cassettes together with the activation of the FLFS mode.

The 'reduced stitching gap'-feature is not available when using Fast ID for identifying images, except for DX-S and CR30-X Digitizers.

For information on the cassette holder, refer to the CR Full Leg Full Spine option for NX Workstations User Manual.

Related Links

Stitching Full Leg Full Spine images on page 154

Operating NX

Topics:

Starting NX

Depending on the account you used to log in to NX, you will be able to perform fewer or more actions in the application (‘user roles’).

A certain feature or feature set (‘operation’) will only be available (and visible) to a user, if this is explicitly granted by the role to which the user is assigned.

To start NX:

1. Switch on the computer.

   Together with Windows, NX starts automatically.

   The Welcome to Windows window appears. Press CTRL-ALT-DEL.

   A Caution window appears, warning the user that the system may only be used by authorized persons.
2. Click OK.

   The Windows log in window appears.
3. Enter the user name and password.
4. Click OK.

   The NX About box appears.

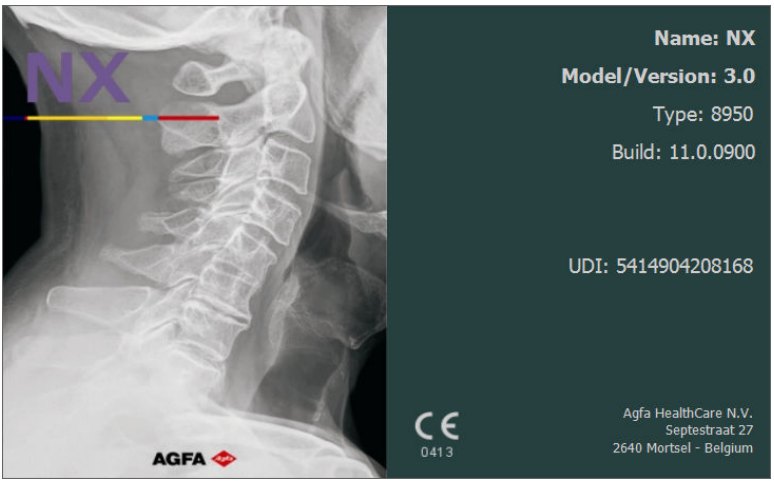


Figure 7: NX About box

Note: An optional window can appear, showing an overview of demo licenses and their status (valid, in grace period, expired). Check the information and click OK to close the window.

As a result:

- The Worklist environment of NX is selected.
- The items are sorted as defined in the configuration (no item is selected).
- The examinations which are still open are available in the Examination or Editing environment.

NX environments

Topics:

Worklist window

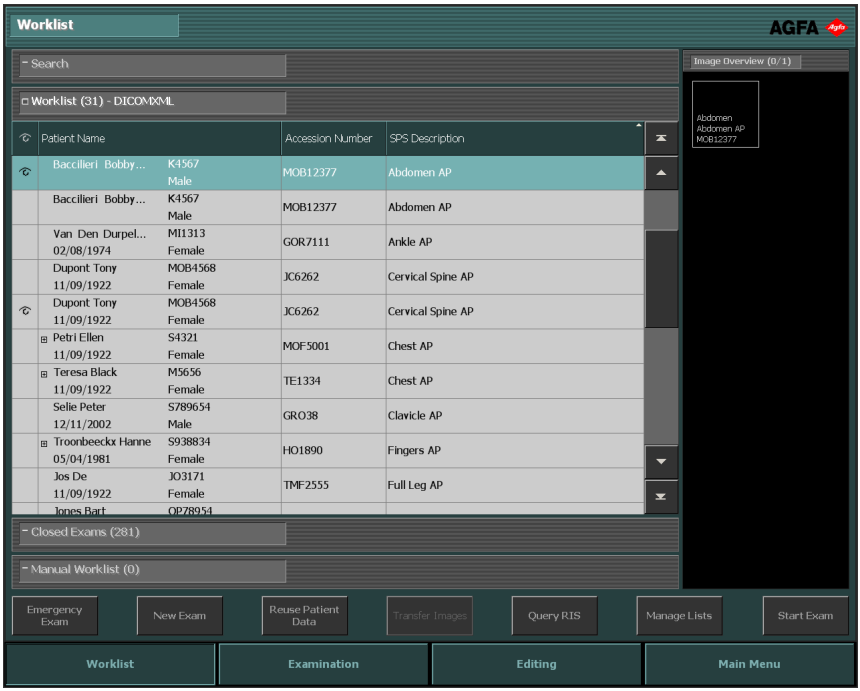


Figure 8: Worklist Window

In the **Worklist** window, you can view and manage the exams that are scheduled and that have been performed.

Related Links

About Worklist on page 98

Examination window

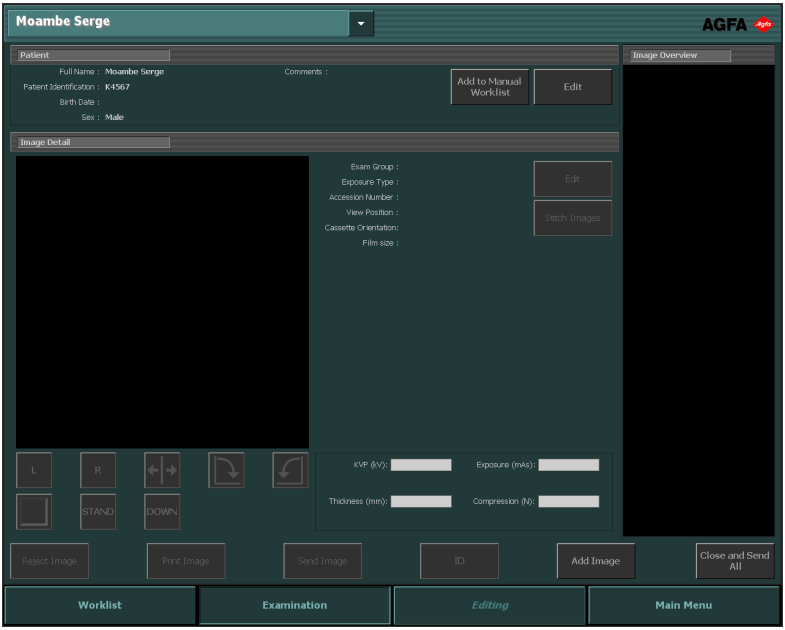


Figure 9: Examination window

In the **Examination** window, you can view and manage the details of a specific examination. The drop-down list in the title bar of the window shows the name of the patient for which the examination is performed. You can select another name from the list to display the examination of the patient. Also the most important tools to prepare the images for diagnosis are available here.

Related Links

About Examination on page 128

Editing window

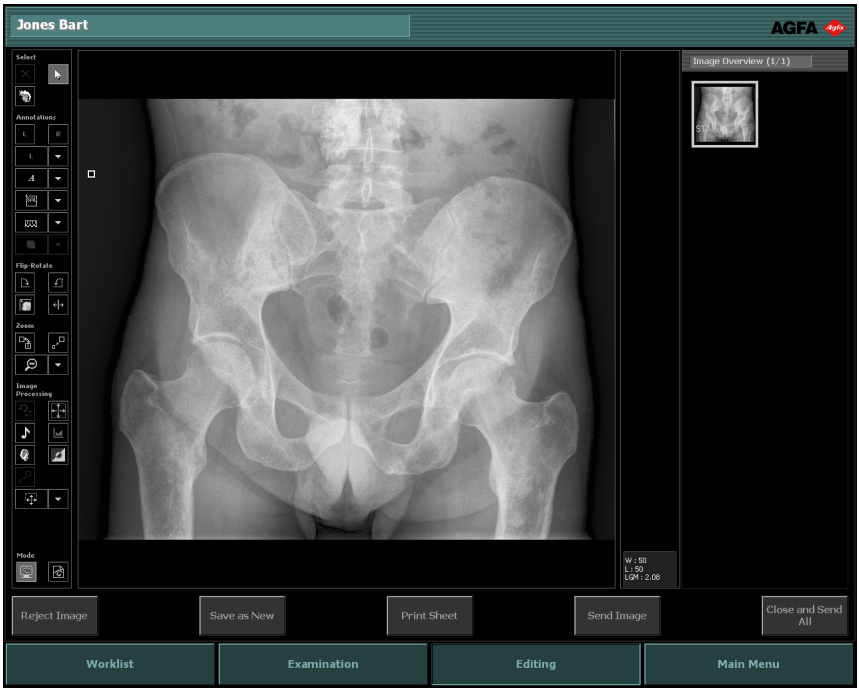


Figure 10: Editing window

In the **Editing** window, you can perform in-depth operations on an image. In this window, you can also prepare the image for printing.

Related Links

About Editing on page 159

Main Menu window

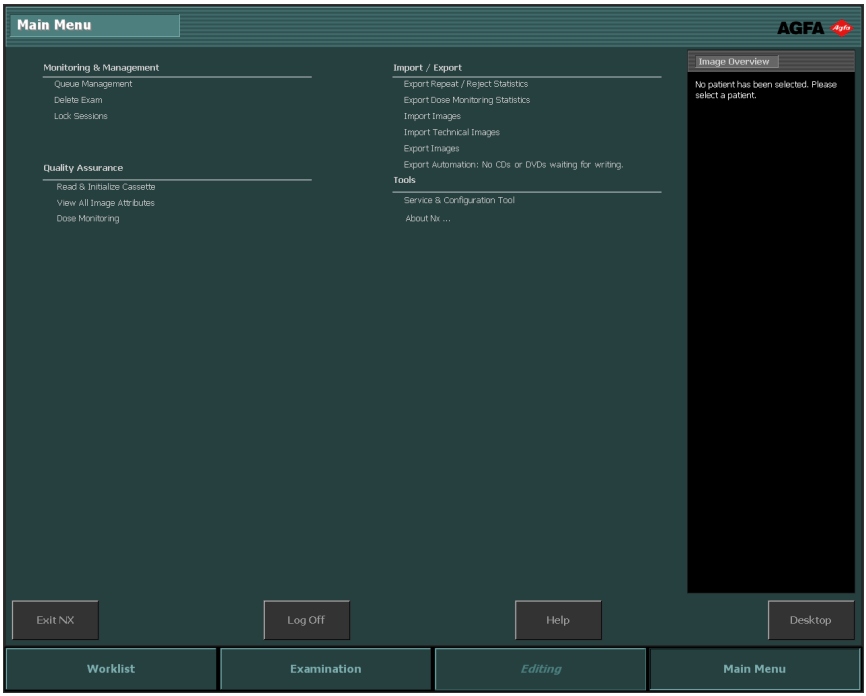


Figure 11: Main Menu window

In the **Main Menu** window, you can manage certain aspects of the NX Workflow which do not belong to the daily workflow.

Related Links

About the Main Menu on page 242

Stopping NX

Topics:

Stopping NX by logging out of Windows

Procedure:

1. Go to the Main Menu.

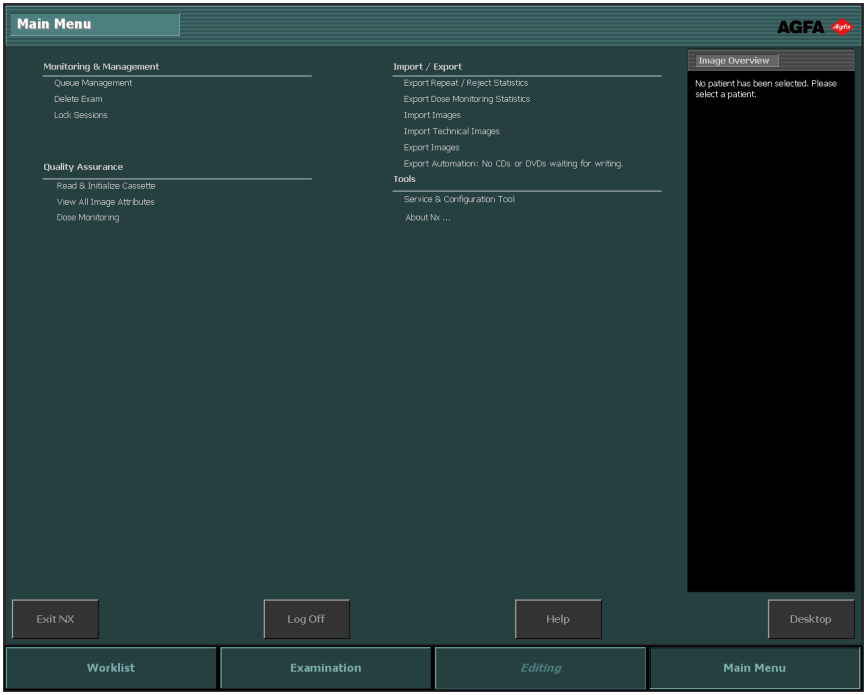


Figure 12: Main Menu window

2. Click the Log Off button.

   As a result:

   - NX is closed.
   - Refer to “Starting NX” to start NX again.

Note: If the NX Service and Configuration tool is open, this tool will not automatically be closed.

Related Links

Starting NX on page 48

Stopping NX without stopping Windows

Procedure

1. Go to the Main Menu.

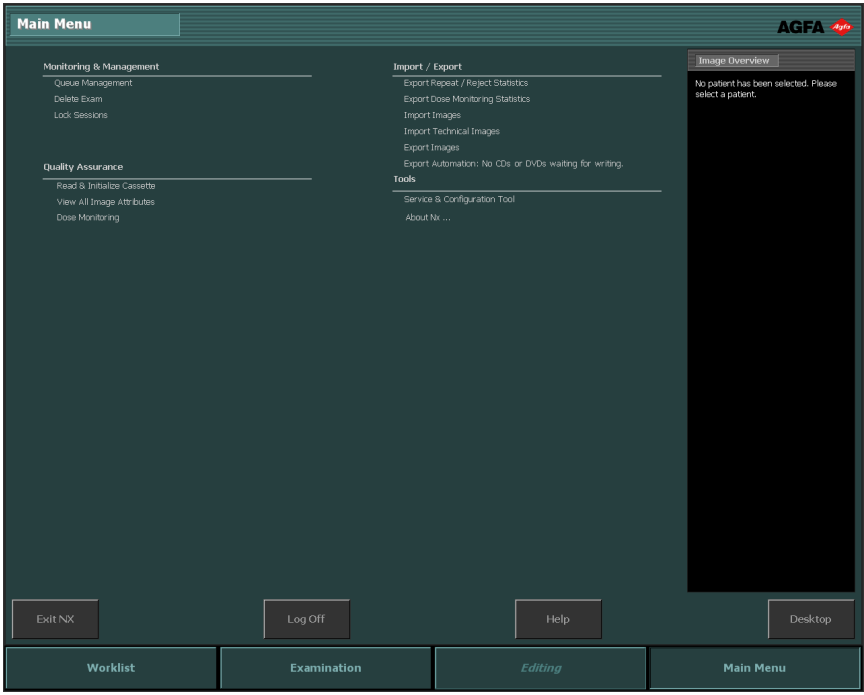


Figure 13: Main Menu window

2. Click the Exit NX action button.

   NX is stopped but Windows remains active.

   To start NX again, go to the Windows Start menu > **Agfa** > **NX** and click **Start NX Viewer** or click the **Start NX Viewer** icon on the desktop.

Switching to Windows without stopping NX

To switch to the Windows environment without stopping NX

1. Go to the Main Menu.

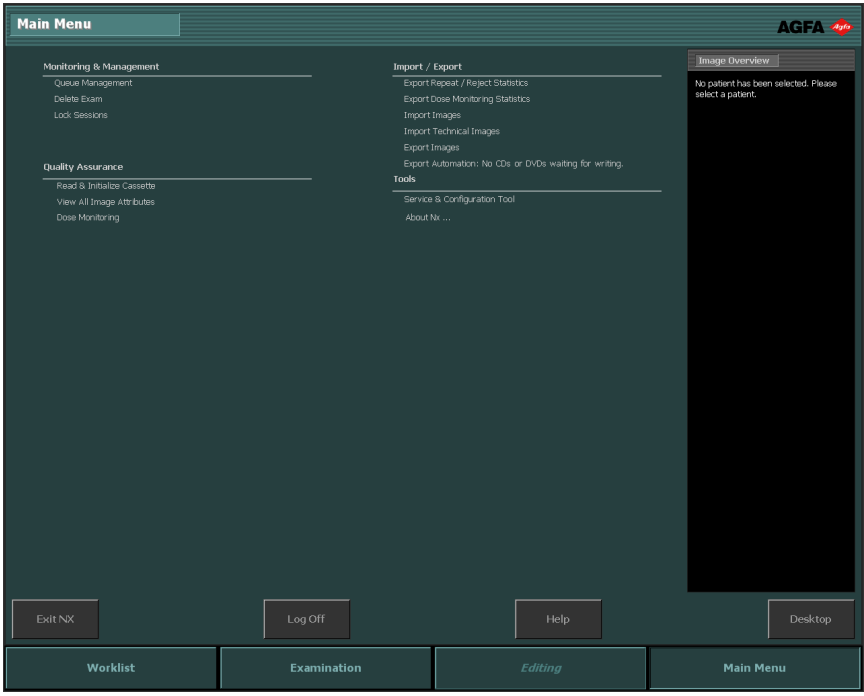


Figure 14: Main Menu window

2. Click the Show Desktop action button.

   The Windows desktop is shown, you can go back to NX by clicking NX in the Windows task bar.

Note: Alternatively, press Windows logo key + D. This key combination minimizes all windows and shows the Desktop.

Note: Pressing Windows logo key + D again, opens all windows and takes you right back to where you were.

Getting started with NX

Topics:

Introduction

In this chapter, you will learn how to work with the NX workstation. NX has a main workflow, which provides an easy touch user interface and high patient throughput. By following this workflow, you will learn how to use NX.

Note: *Depending on your hospital workflow, steps can be not applicable.*

Topics:

DR workflow

1. Open a patient from the RIS or enter patient data manually.

   When a new patient comes in, define the patient info for the exam.
2. Selecting the examinations.

   Set the exposure instructions for the exam.
3. Perform X-Ray exposures.
4. Performing quality control.

   Assess the image quality and prepare the images for diagnosis. Send the images to a hardcopy printer or PACS (Picture Archiving and Communication System).

Note: *Next to this main workflow, you have a wide number of image processing tools in the Editing window.*

Related Links

DR workflow on page 72

CR workflow

1. Open a patient from the RIS or enter patient data manually.

   When a new patient comes in, define the patient info for the exam.
2. Selecting the examinations.

   Set the exposure instructions for the exam.
3. Identifying the cassettes.

   Identify the cassette that carries the exam. You are free to perform X-Ray exposures before or after identification.
4. Digitizing the images.

   The Digitizer sends the images to NX.
5. Performing quality control.

   Assess the image quality and prepare the images for diagnosis. Send the images to a hardcopy printer or PACS (Picture Archiving and Communication System).

Related Links

CR workflow on page 79

Opening a patient from the RIS

Procedure:

1. In the **Worklist** window:
   - Select an exam from the list (1) and click Start Exam (2).
   - Press the displayed thumbnail.
   - Double-click an exam in the list.

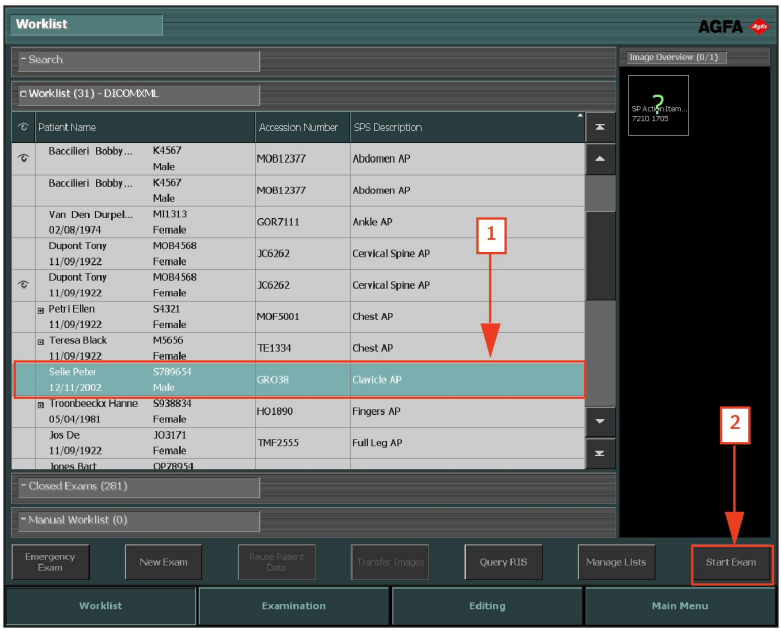


Figure 15: Starting an Examination from the Worklist window

Note: If your system is configured to interpret protocol codes, the images may be preselected. In that case, the images are automatically added when you click Start Exam.

2. The patient (1) and exam (2) details are displayed in the **Examination** window.

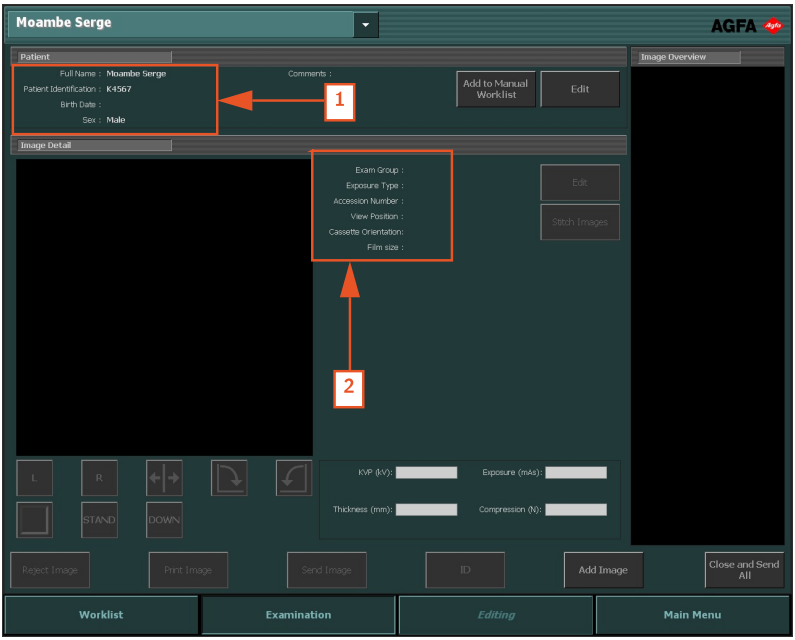


Figure 16: Examination window

Manually entering patient data

Procedure:

1. In the **Worklist** window, click **New Exam**.

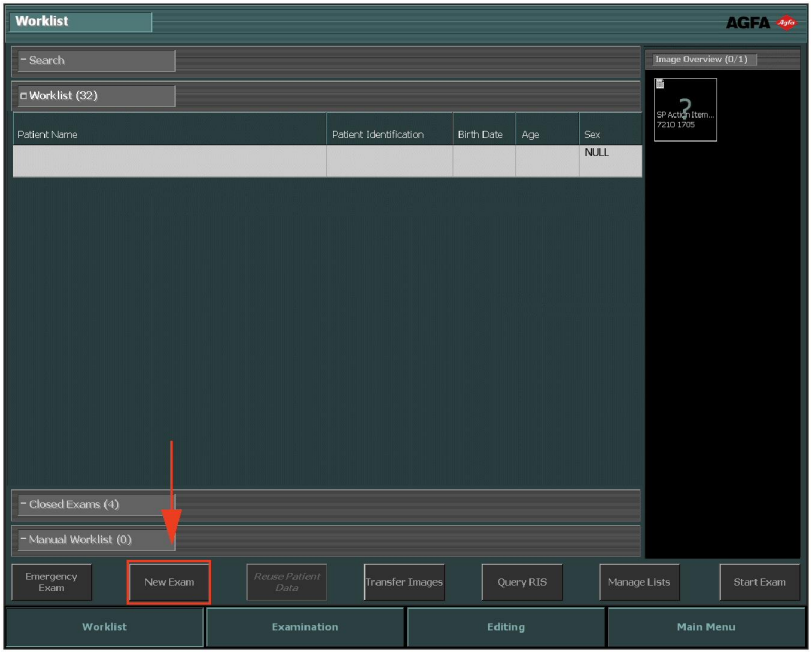


Figure 17: Manually Entering patient data

2. The **Examination** window opens, where you have to fill in the patient information. All fields with an asterisk on the right side are mandatory and must be filled in to be able to continue.

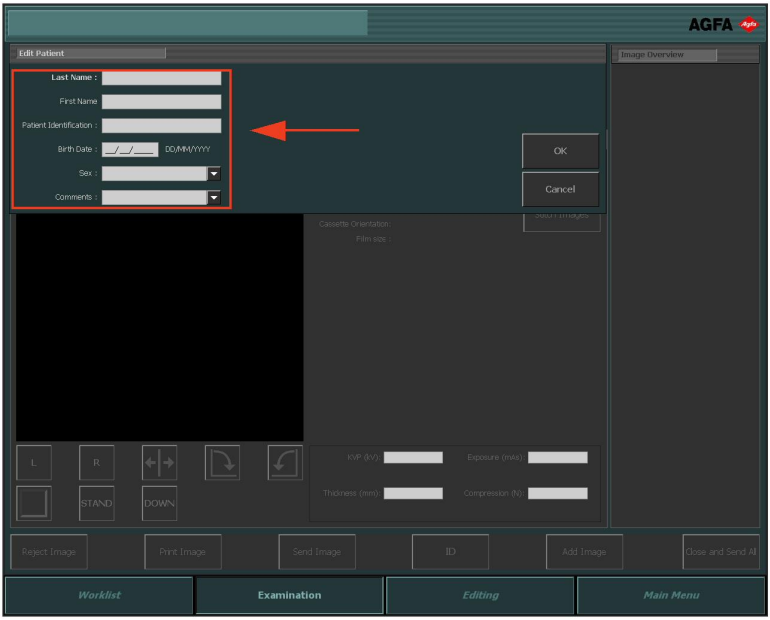


Figure 18: Edit patient pane

3. Click **OK**.

   In case no birth date or age was provided in the patient information, an additional window appears asking to select the patient's age group.

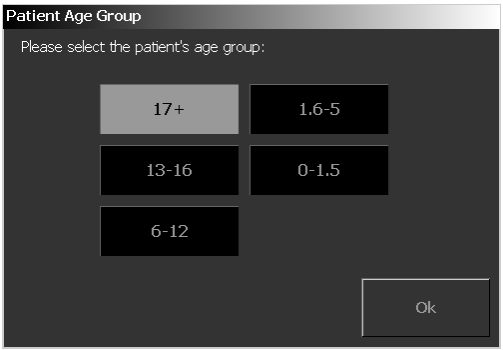


Figure 19: Patient Age Group window

4. Select the patient's age group and click **OK**.

   The **Add Image** window opens, where you can add the necessary images.

Figure 20: Add Image window

5. Click **OK**.

Composing the examination

Procedure:

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

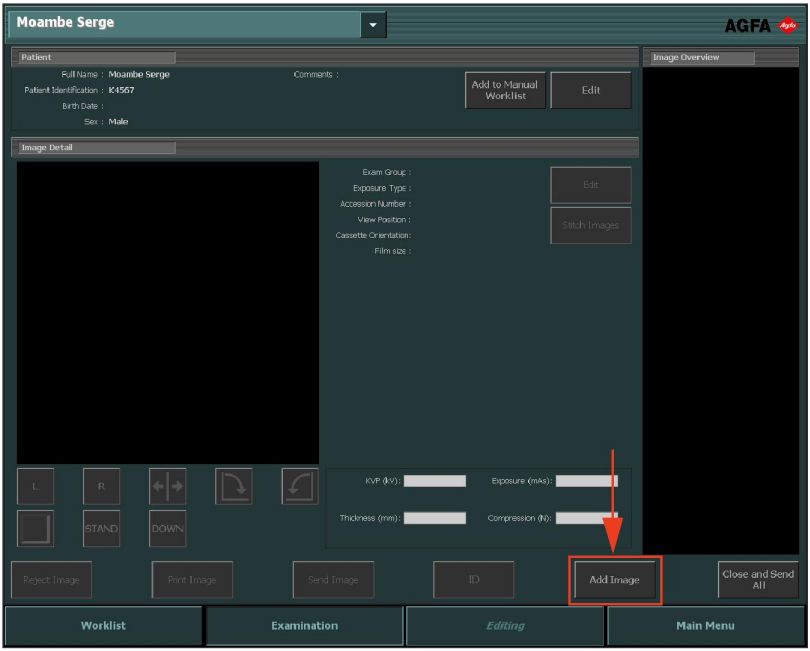


Figure 21: Examination window with Add Image button highlighted

Note: If your system is configured to interpret protocol codes, the images may be preselected. In that case, the images are automatically added when you click Start Exam.

In case no birth date or age was provided in the patient information, an additional window pops up asking to select the patient's age group.

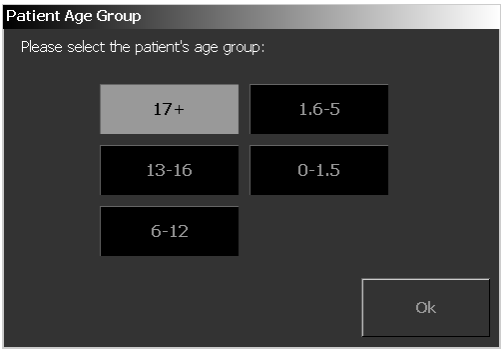


Figure 22: Patient Age Group window

2. Select the patient's age group and click **OK**.

   The **Add Image** window appears.

Figure 23: Add Image window

Note: *The age group is automatically selected by calculating age, based on the patient's birth date. Only in exceptional cases, you should change the age group.*

3. Specify the exam type by first selecting a group, followed by an exposure type. Repeat this step for every additional exposure type you want to add.

Note: On DR environment, the exposure type thumbnails look differently. Refer to "Defining exposures".

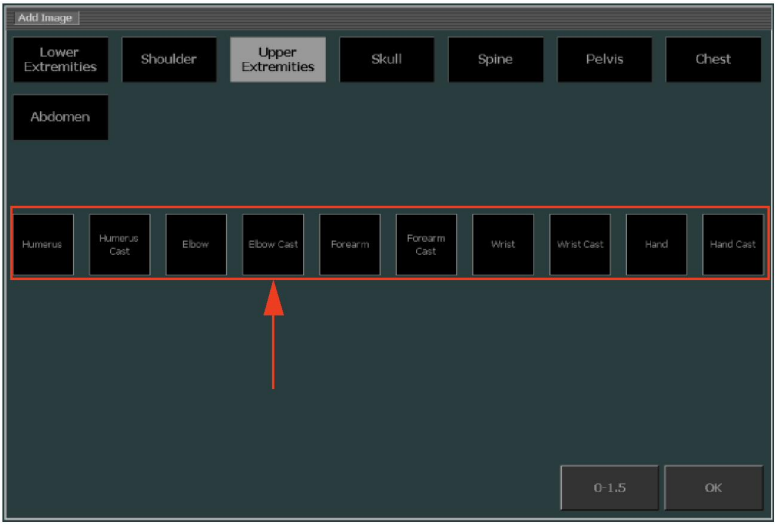


Figure 24: Select Exposure Type in Add Image window

The image thumbnail is added to the image overview.

4. Click **OK**.

Related Links

Defining exposures on page 140

Selecting and Performing X-Ray Exposures

The procedure for selecting and performing X-Ray exposures depends on the configuration settings of the NX, the digitizer and the connectivity to the X-Ray modality. The main workflow types are described in the following sections.

Topics:

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.

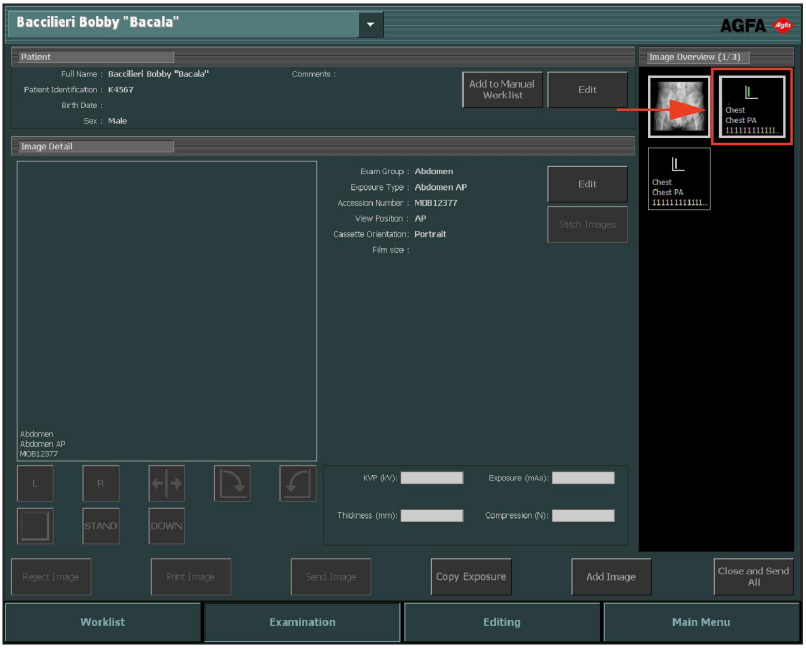


Figure 25: Examination Window with image thumbnail highlighted

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 26: 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:

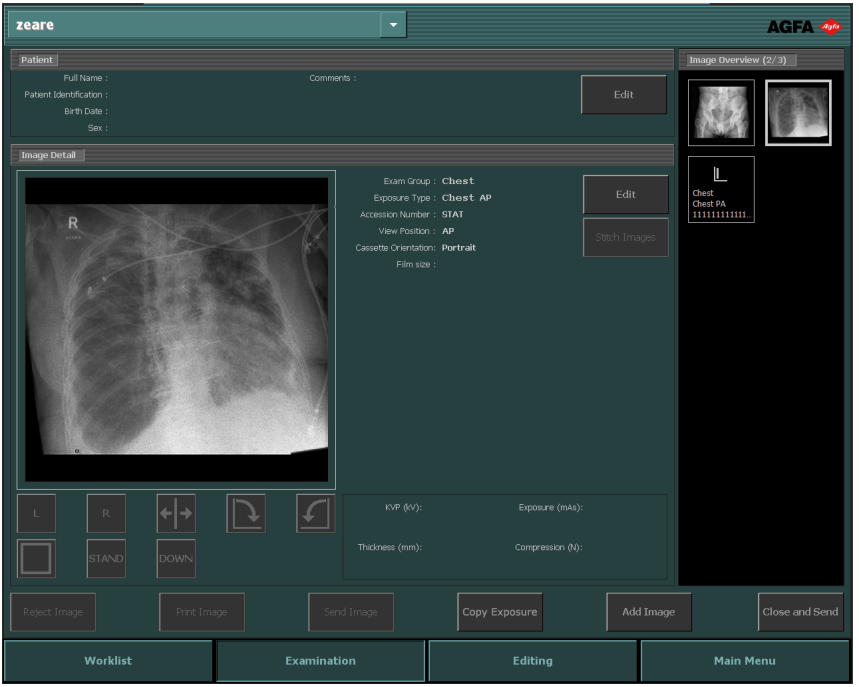


Figure 27: Examination window after making exposure on a DR Detector.

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.

Related Links

Changing specific image settings on page 143

Suggested Radiographic References and User Guides on page 307
A guide to “Exposure index of digital X-ray imaging systems” - IEC 62494-1 Standard.

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.

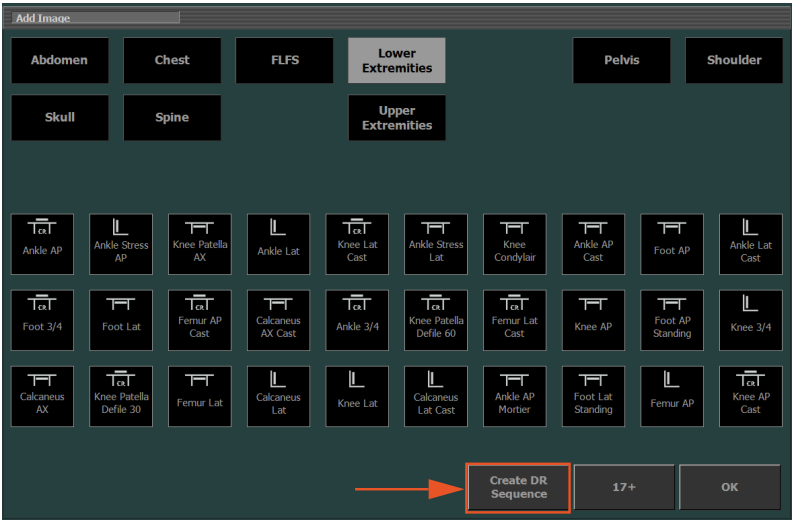


Figure 28: Create DR Sequence button

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.
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 29: Examination window in full screen mode

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

Figure 30: Close button

Topics:

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

DR detector status

Image	Description
	Grey: The image is planned and the DR detector is in sleep mode. On a thumbnail that is not selected, the status indication is always grey.
	Green: The DR detector is ready to acquire the exposure on the selected acquisition system.

Image	Description
	Green flashing: The exposure has been performed and the acquisition is ongoing.
	Red: The DR detector is out of order. Red flashing: The selected acquisition system is starting up.

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 31: 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.

Related Links

Rejecting/unrejecting an image on page 147

CR workflow

Topics:

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.

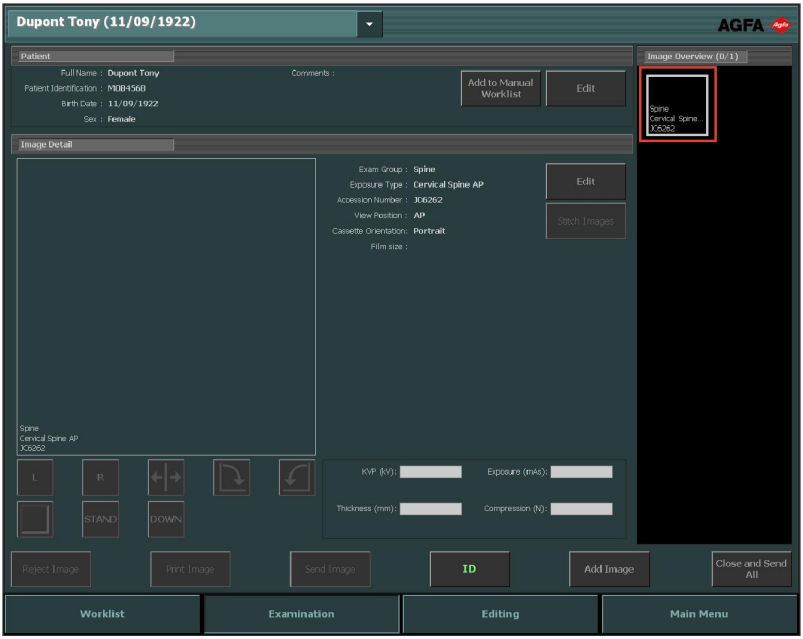


Figure 32: Thumbnail selection in Examination window

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

Figure 33: Examination window with ID button highlighted (cassette workflow).

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

Figure 34: 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.

- ID label on the thumbnail (1).
- ID label on the image (2),

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

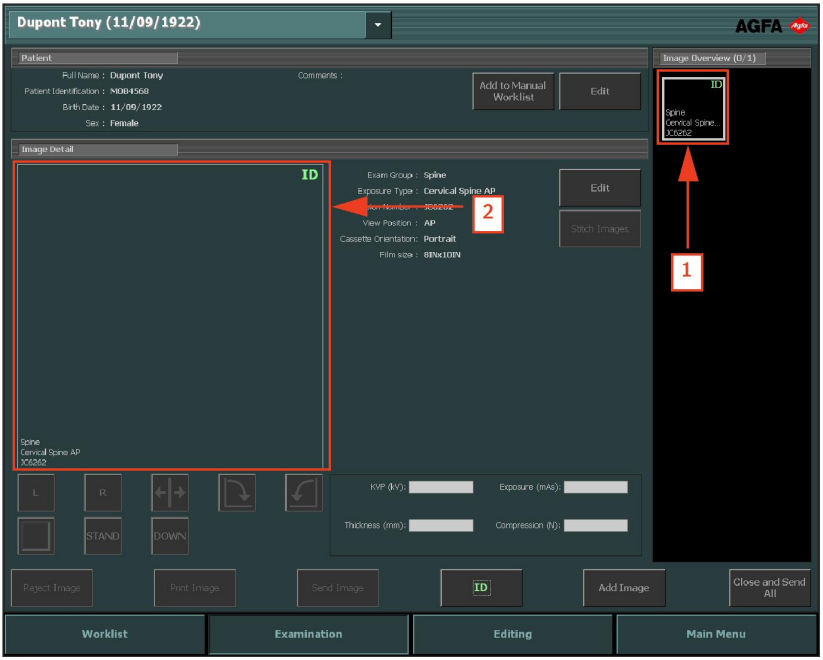


Figure 35: Examination window with identified exposure (cassette workflow)

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.

Related Links

Changing specific image settings on page 143

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.

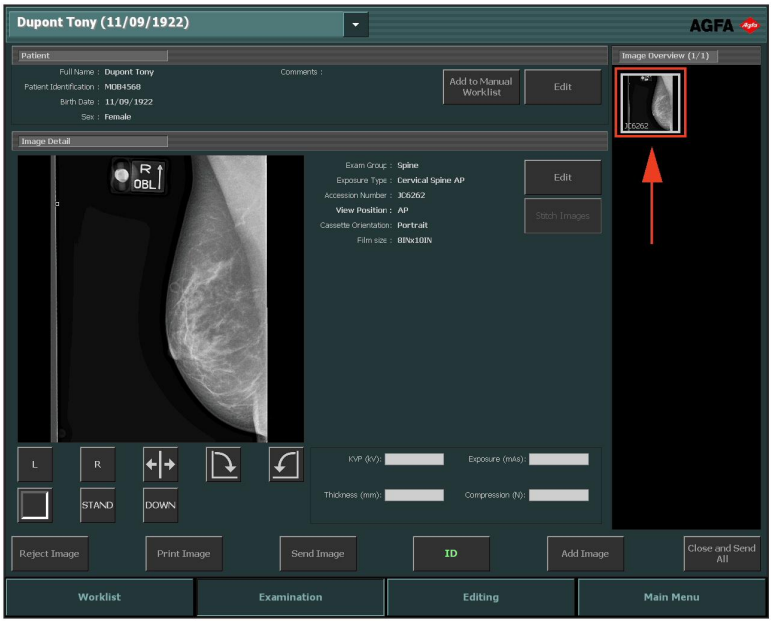


Figure 36: Image appears in Examination window

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.

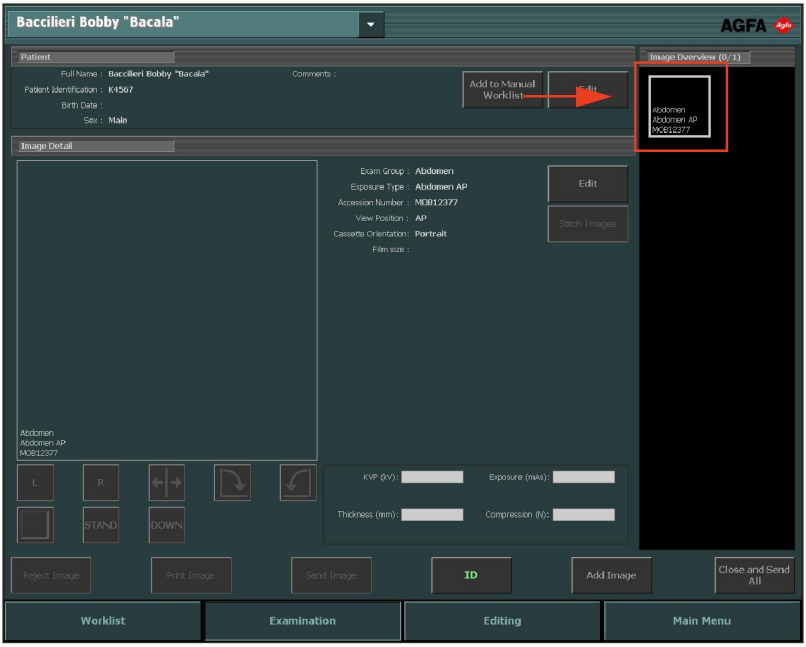


Figure 37: Examination Window with image thumbnail highlighted

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.

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

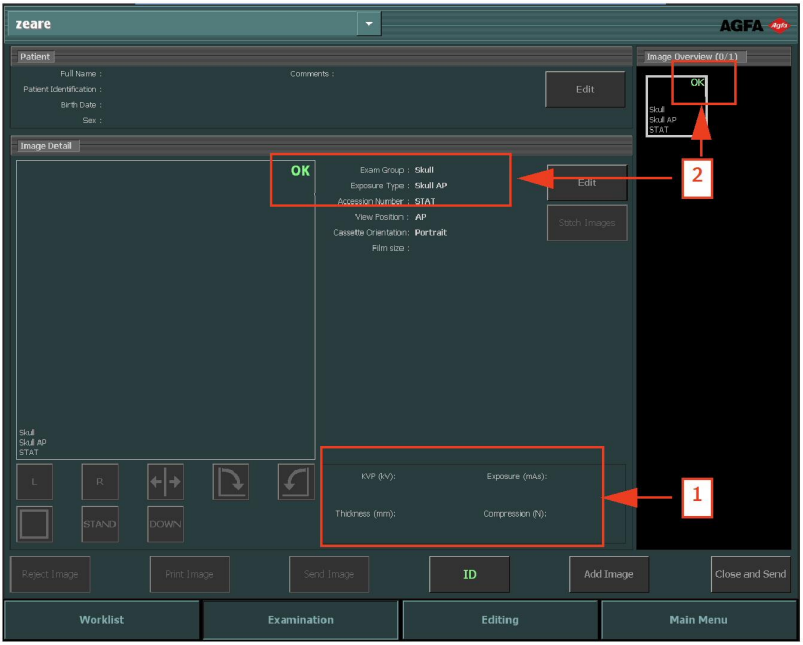


Figure 38: Examination window after making exposure in a connection with the X-Ray modality

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.*

Related Links

Suggested Radiographic References and User Guides on page 307

A guide to “Exposure index of digital X-ray imaging systems” - IEC 62494-1 Standard.

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.

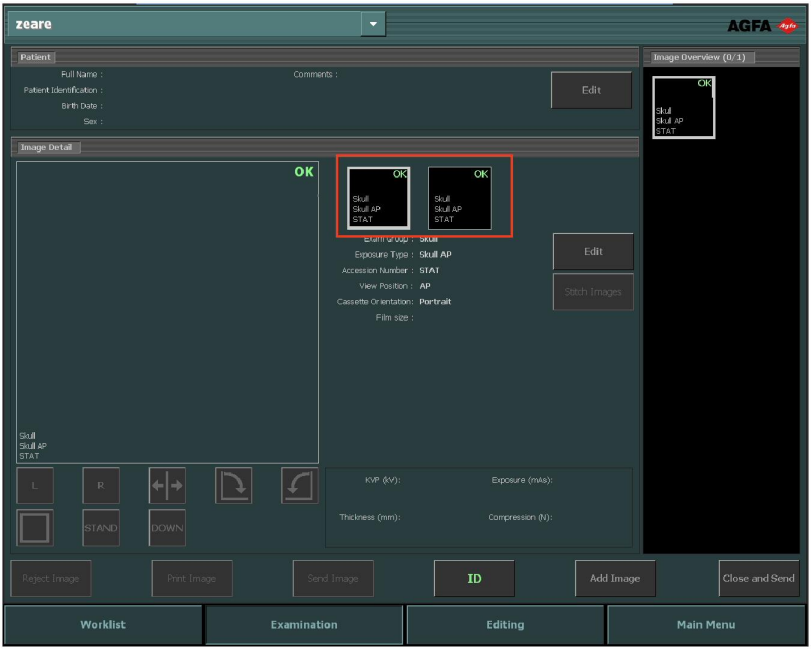


Figure 39: Multiple Exposures on same cassette shown in Examination window.

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.

Related Links

Adding annotations to an image and using the measurement tools on page 179
Adding an Estimated Radiographic Magnification Factor (ERMF) on page 193

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.

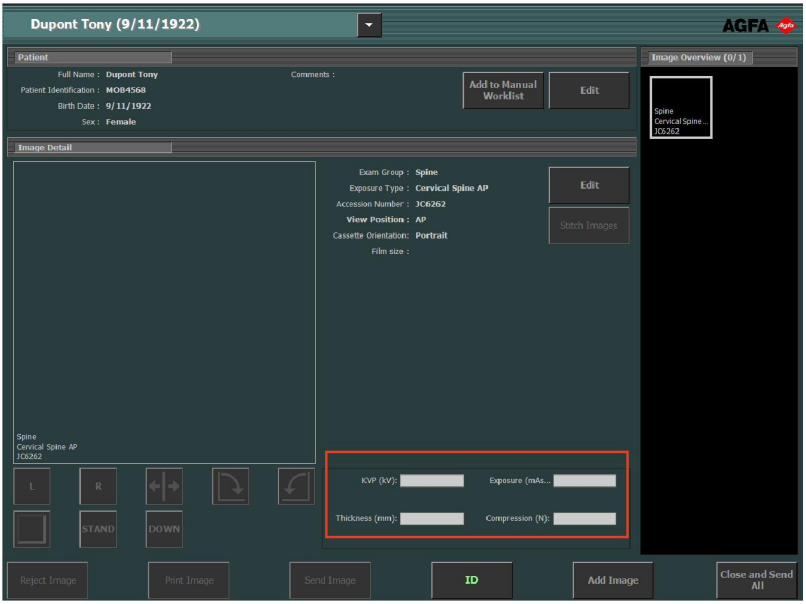


Figure 40: X-Ray parameters in Examination window

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.

Related Links

Adding an Estimated Radiographic Magnification Factor (ERMF) on page 193

Performing quality control

Procedure:

1. In the **Image Overview** pane of the **Examination** window, select the image on which you want to perform quality control. (1)

   The image is displayed in the **Image Detail** pane. (2)

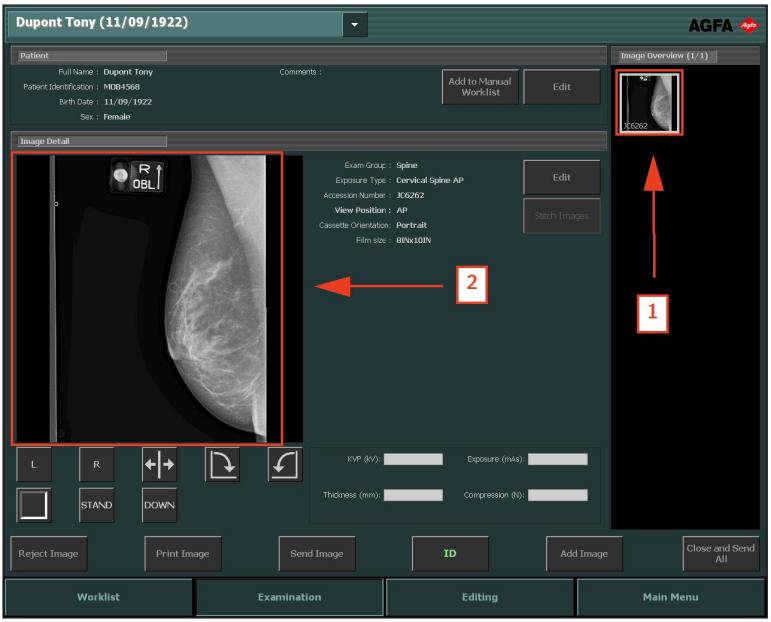


Figure 41: Examination window with image displayed in Image Detail pane

2. Prepare the images for diagnosis by using the tools in the **Image Detail** pane.

   The following table explains the functionality of these tools.

Button	Functionality
 **Figure 42: Left Marker button**	Adds a left marker. Click the button, and then click the image where you want to place the marker. To remove the marker, select it and then press the **Delete** button.

Button	Functionality
 **Figure 43: Right Marker button**	Adds a right marker. Click the button, and then click on the image where you want the place the marker. To remove the marker, select it and then press the **Delete** button.
 **Figure 44: Flip button**	Flips the image around the vertical axis.
 **Figure 45: Rotate Counterclockwise button**	Rotates the image 90° counterclockwise.
 **Figure 46: Rotate Clockwise button**	Rotates the image 90° clockwise.
 **Figure 47: Freehand rotate button**	Rotates the image by an arbitrary angle.
 **Figure 48: Black Border button**	Turns on or off the black borders for masking non-relevant image areas. Turns on or off cropping of the non-relevant image areas of DR images or CR 10-X images.

Button	Functionality
 **Figure 49: Full Screen button.**	Switches the active image to full screen mode.
 **Figure 50: High Priority Marker button.**	Enables you to put a high priority marker on the image. The image gets the highest priority in the printing and archiving queues and a high priority DICOM attribute that can be used to make a selection on the archiving station.

Note: The available buttons depend on the configuration in the NX Service and Configuration Tool. Refer to the Key user manual for more information.

3. If all images are OK, click **Close and Send All** or press **F4**.

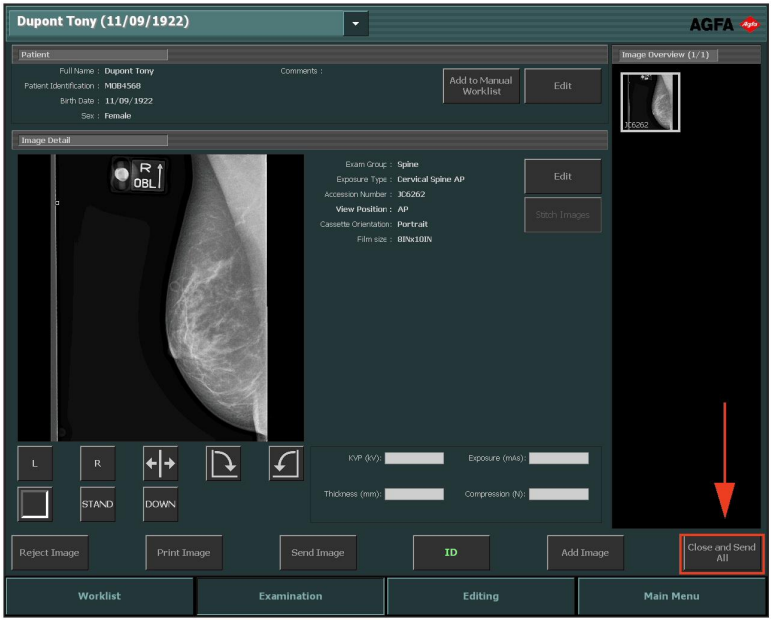


Figure 51: Examination window with Close and Send All button highlighted

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

About extensive Editing possibilities

In the **Editing** window, you can perform in-depth operations on an image. In this window, you can also prepare the image for printing.

*Note***:** *The tools available in the editing environment are designed to be used by the mouse pointer. This is the most efficient way to perform these more complex tasks.*

The **Editing** window has two modes:

- Normal mode: focussed on softcopy users; in this mode the print tools are not available.
- Print mode: in this mode the print tools are added to the tools pallet and images are displayed in a WYSIWYG print preview.

*Note***:** *In the NX Service and Configuration Tool you can select the default mode, depending on your workflow (print or PACS).*

The following toolsets are available in both modes. The tools are displayed in several task-specific sections:

- **Select**: general tools to manage the images.
- **Annotations**: add diagnostic annotations to images.
- **Flip-Rotate**: change the geometry of images.
- **Zoom**: change the view of an image.
- **Image Processing**: process images before printing.

The **Print** mode has an additional tool set to prepare the image for printing.

Worklist

Topics:

About Worklist

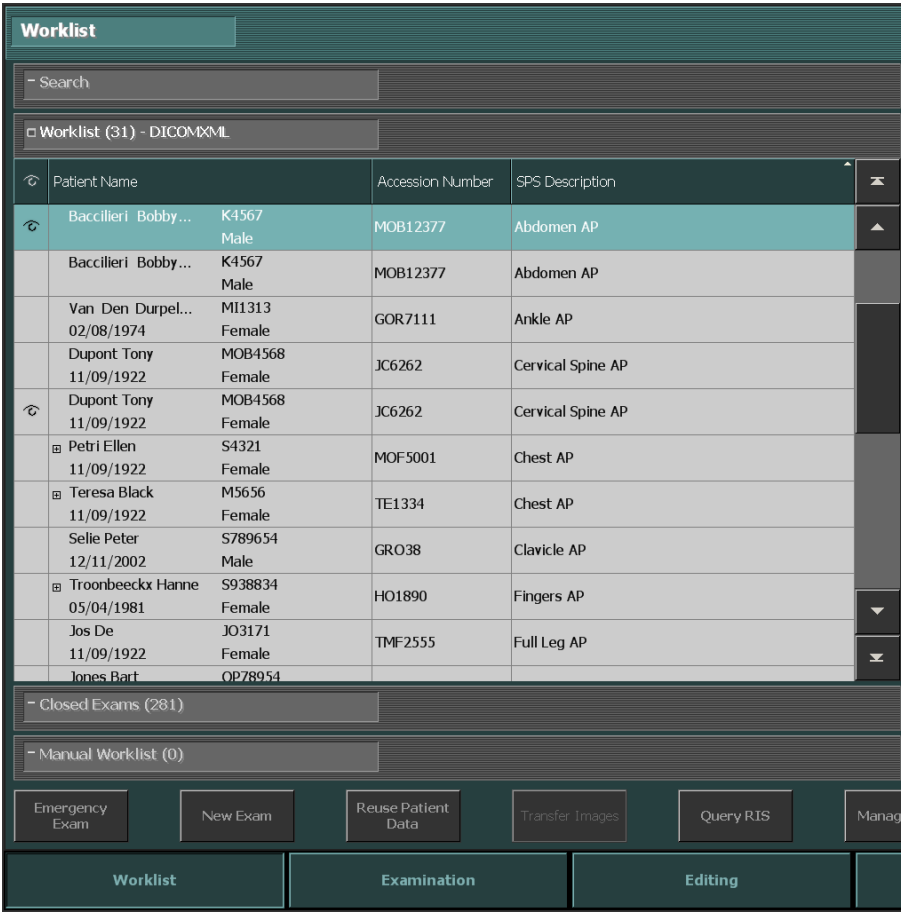


Figure 52: Worklist Window

The Worklist window is designed to be used by touch screen, simply touch the active area of the screen to activate a function or to perform a selection.

In the **Worklist** window, you can view and manage the exams that are scheduled via the Worklist pane.

The **Worklist** window has five panes. The **Image Overview** pane is always visible on the right side of the application. To open one of the other panes, click the title bar of the pane.

- Search pane: search for an exam
- Worklist pane: a list of planned exams

- Closed Exams pane: a list of closed exams
- Manual Worklist pane: a manually created local list of patient data
- Image Overview pane: a thumbnail overview of the images that are included in the selected exam.

At the bottom of the window, you can also find several action buttons to perform specific actions.

Related Links

Using Worklist on page 111

Topics:

Browsing through the lists

There are several possibilities to browse through the **Worklist**, **Closed Exams** or **Manual Worklist**:

- You can scroll in the list with the scroll buttons on the right side of the pane:

Scroll Button	Functionality
	Move to the top of the list.
	Move the list up one entry at a time.
	Move the list down one entry at a time.
	Move to the bottom of the list.

- You can sort a list alphabetically or by number by clicking on the column header. A small arrow will appear. Click once to arrange the list, click twice to reverse the order. A third click will return to the default sort criteria.
- You can also search by typing in the selected list. Type one or more letters on the keyboard; as a result the first entry starting with these letters will be highlighted in the column that is used for sorting the list.

Search pane

Figure 53: Search pane

In this pane, you can search for exam data.

Related Links

Searching the worklist on page 117

Worklist pane

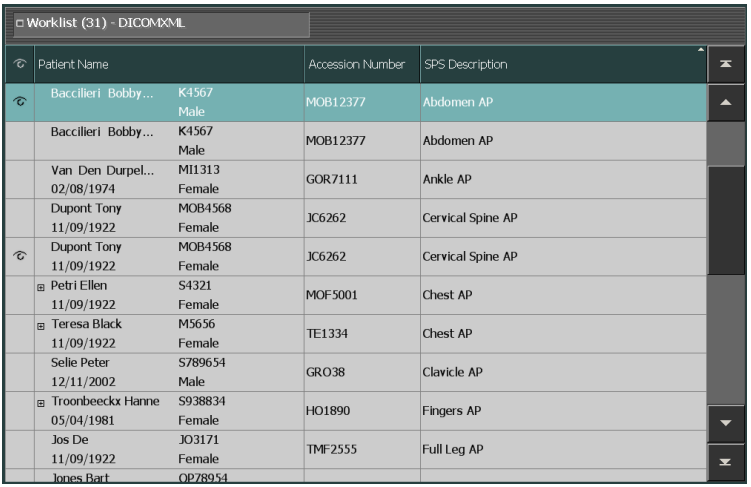


Figure 54: Worklist pane

The **Worklist** pane shows the list of planned exams and exams that are still in progress. The exams are imported from the RIS (if available).

The total number of entries in the list is shown in the title bar. If NX is configured to work with more than one RIS, the available RIS systems are grouped in a drop down list next to the title field of the title bar.

Figure 55: Title bar showing number of entries

In a standard configuration, the following parameters are displayed for each exam in the list:

Parameter	Explanation
	This icon is displayed when the exam is open in the Examination window.
	This icon appears next to the examination in the worklist if the same examination is being looked at on an NX Central Monitoring System.
Patient Name	The name, unique ID, birth date and gender of the patient. When several exams are planned for the same patient at the same time, this is indicated by a '+' sign.

Parameter	Explanation
	Click the '+' sign to view all planned exams for that patient.
Accession Number	The reference number of the exam.
SPS Description	A short description of the exam types. SPS stands for Scheduled Procedure Step.

Note: *The available parameters depend on the configuration in the NX Service and Configuration Tool. Refer to the Key user manual for more information.*

In this pane, you can:

- Browse through the list
- Sort on each parameter
- Start an exam

Closed Exams pane

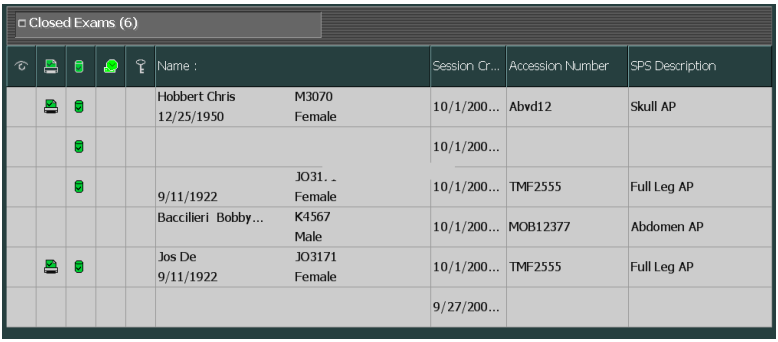


Figure 56: Closed Exams pane

The **Closed Exams** pane shows the list of closed exams.

The total number of entries in the list is shown in the title bar. In a standard configuration, the following parameters are displayed for each closed exam in the list:

Parameter	Explanation
	Indicates the print was successful.
	Indicates the send action to an archive was successful.
	Indicates if the exam is locked. A key user can lock an exam if he wants to prevent it from being deleted. For more information, refer to “Lock Examinations”.
	This icon appears next to the examination in the Closed Exam list if the same examination is being looked at on an NX Central Monitoring System.
	Indicates if an image was successfully written to CD/DVD.
	Indicates the dose report is successfully sent to the configured destination(s).
Name	The name and unique ID of the patient.

Parameter	Explanation
Accession number	The reference number of the exam.
SPS Description	A short description of the exam type.

Note: *The available parameters depend on the configuration in the NX Service and Configuration Tool. Refer to the Key user manual for more information.*

In this pane, you can:

- Browse through the list
- Sort on each parameter
- Reopen a closed exam

Related Links

Closing the exam and sending all images on page 149
Lock Examinations on page 254

Manual Worklist pane

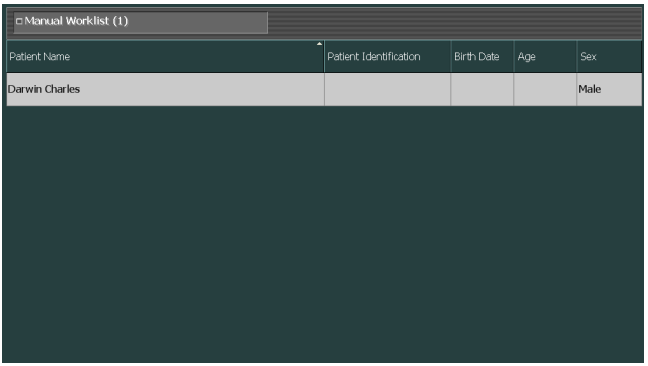


Figure 57: Manual Worklist pane

If NX is configured in such a way that the manual worklist tab is visible, you can manage a manually created local list of patient data in the **Manual Worklist** pane. Patients in the Manual Worklist are kept in this list, even when their exams are closed and sent to a destination.

This can be useful when you do not have a RIS available and you have an intensive care unit where patients need a chest scan every day and patient data need to be accessible easily.

The **Manual Worklist** shows basic patient information, without preview of the images. It has no connection with the other list panes (**Worklist** and **Closed Exams**).

Note: *The available panes depend on the configuration in the NX Service and Configuration Tool. Refer to the Key user manual for more information.*

For each patient in the list, the following information is displayed:

- **Patient name**
- **Patient Identification**: the unique ID of the patient
- **Birth Date**
- **Age**
- **Sex**

You can add patients from the **Examination** window.

You can sort a list alphabetically or by number by clicking on the column header. A small arrow will appear. Click once to arrange the list, click twice to reverse the order. A third click will return to the default sort criteria.

Related Links

Adding a patient to the Manual Worklist on page 143

Image Overview pane

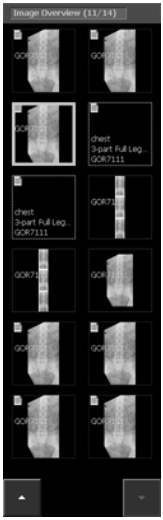


Figure 58: Image Overview pane

In the **Image Overview** pane, an overview of the images in the exam is displayed when an exam is selected in the **Worklist** or **Closed Exams** pane.

The title indicates the number of images taken and the total number of images in the exam.

If the exam consists of more than 12 images then the following buttons will be displayed at the bottom of the pane. They can be used to navigate through the thumbnails.

The images are displayed in several ways, as shown in the next table:

Image	Description
	The image is planned, but not yet treated by the modality. A small description is displayed.

Image	Description	
	The cassette is identified (exam data are written to cassette).	
	The image is taken and is waiting to be approved and printed.	
	The status icons indicate that an image was successfully sent out.	
		the image is written to CD/DVD
		the image is sent to an archive
		the dose report is sent to the configured destination(s)
		the image is printed
	Depending on your workflow (CD/DVD, print or archive oriented), one or more of the icons will appear. They appear after a **Close and Send All** action, writing the image to CD/DVD, or if you have manually printed or sent images from an open exam.	

Note: *The border of partial full leg full spine thumbnails, of both the image and the exposure, is dashed.*

Related Links

Image Overview Pane on page 133

Action buttons

The **Worklist** has several action buttons to perform specific actions. The following table gives a short description of their functionality.

Button	Description
Emergency Exam	Start an exam for an emergency patient
New Exam	Start an exam by manual entry
Reuse Patient Data	Copy patient data into a new exam
Query RIS	Refresh the information in the Worklist
Manage Lists	Manage the information in the Manual Worklist or manage the DICOM worklist query.
Transfer Images	Transfer images from one exam to another
Start Exam	Start an exam from the Worklist. Reopen a closed exam.
Open application, folder or file	Open an external application, folder or file.

Related Links

Starting an emergency exam on page 116
Starting a new exam on page 112
Copying patient data into a new exam on page 120
Refreshing the information in the Worklist on page 112
Managing the worklists on page 122
Transferring images from one exam to another on page 119
Reopening a closed exam on page 114
Opening an application, folder or file on page 126

Using Worklist

Topics:

Starting a new exam

Topics:

Selecting a RIS

If NX is configured to work with more than one RIS, the available RIS systems are grouped in a drop-down list under the Title field of the Title bar. Press the icon next to the title and select a RIS.

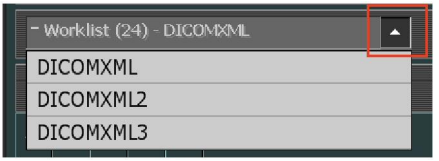


Figure 59: Selecting a RIS

Refreshing the information in the Worklist

When beginning your working day the worklist might be empty. In order to search for the necessary exam data in the **Worklist** you need to update it with recent changes first. To do so, click **Query RIS** or press **F5**.

Note: *The update can also happen automatically at certain intervals if NX is configured in that way.*

Starting an exam from the Worklist

You can start an exam for an existing patient in the **Worklist** pane by taking the following steps:

Procedure:

1. In the **Worklist** window:
   - Select an exam from the list (1) and click Start Exam (2).
   - Press the displayed thumbnail.
   - Double-click an exam in the list.

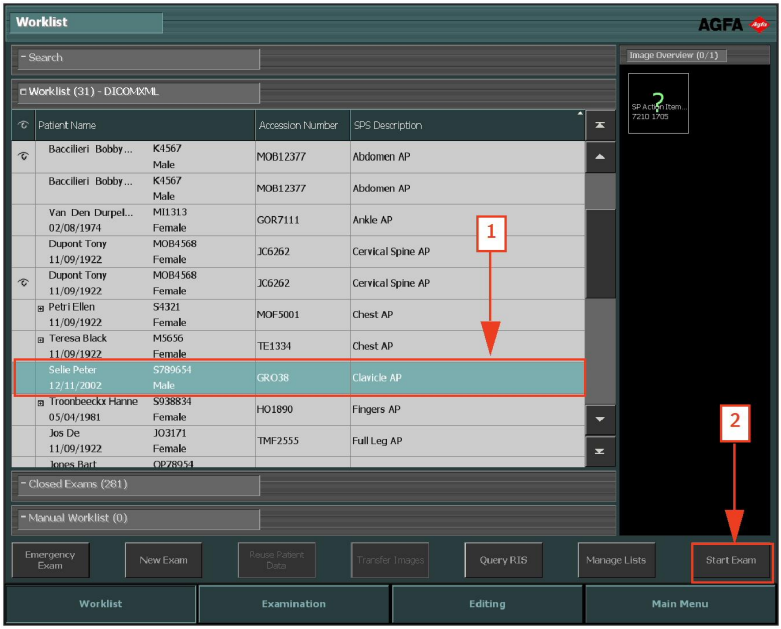


Figure 60: Starting an Examination actions in Worklist window

2. The patient and exam details are displayed in the **Examination** window.
3. Define the exam type.

Related Links

Defining exposures on page 140

Starting an exam by manual entry

Next to the patients that are registered through a worklist, it is possible to create and perform a new exam directly for a patient (for example when the RIS is not available).

To add a new exam, take the following steps:

1. In the **Worklist** window, click the **New Exam** button.

   The **Examination** window opens, where you have to fill in the patient information:

Figure 61: Edit Patient pane

2. Enter all the information that is needed for the exam.

   Once you have filled in a field, you can use the Tab key on your keyboard to go to the next one.
3. Click **OK**.
4. When the images are made, finalize the exam.

Related Links

Preparing the exam for identification on page 140
Finalizing the exam after the images have been received on page 144

Reopening a closed exam

You can reopen an exam that is already in the **Closed Exams** list by taking the following steps:

Procedure:

1. In the **Closed Exams** list:

   - Select an exam from the list and click Start Exam.
   - Press the displayed thumbnail.
   - Double-click an exam in the list.

   The exam is reopened in the **Examination** window.

2. Make the changes that you want to make and click **Close and Send All**.

   The exam is closed again.

Related Links

About Examination on page 128

Starting an emergency exam

Note: The available patient data fields and exams depend on the configuration in the NX Service and Configuration Tool. Refer to the Key user manual for more information.

Next to the exams that are registered through a worklist, it is possible to create and perform a new exam directly for an emergency patient.

To create an emergency exam, take the following steps:

1. Click the **Emergency Exam** button.

   The **Examination** window opens, with default patient data and preconfigured exams:

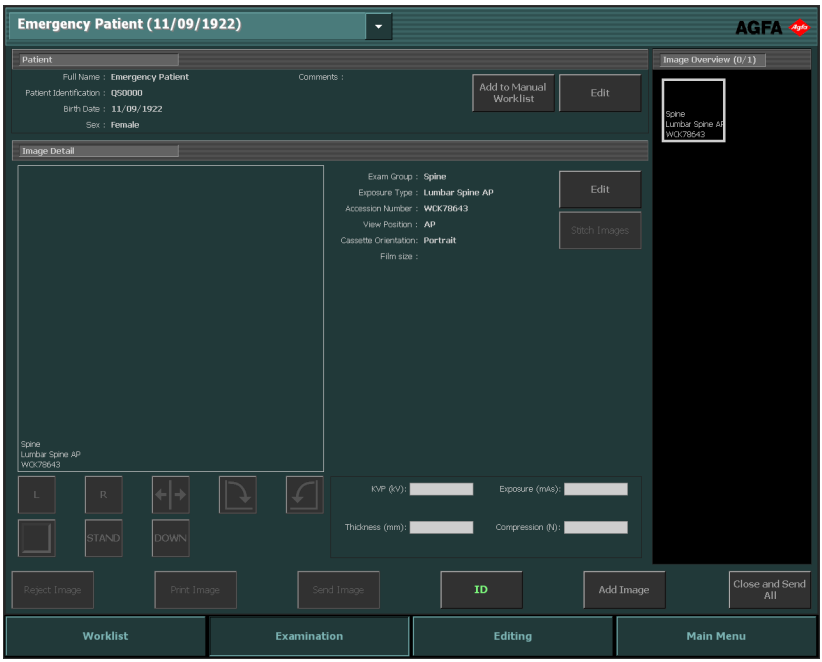


Figure 62: Emergency Exam in Examination window

2. Enter all the information that is needed for the exam.
3. When the images are made, finalize the exam.

Related Links

Preparing the exam for identification on page 140
Finalizing the exam after the images have been received on page 144

Searching the worklist

The Search pane in the Worklist window allows you to search for the exam data you need within the worklist in different ways:

1. From the **Search By** drop-down list, select the parameter for which you want to search. This can be:
   - Patient Name
   - Patient ID
   - Accession Number
   - Session Date
   - Exam group

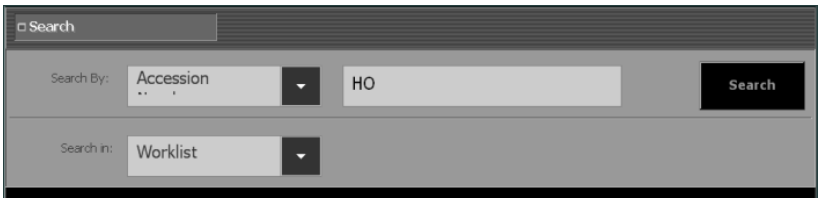


Figure 63: Search pane

2. From the **Search In** drop-down list, select the list where you want to search in. This can be:
   - Worklist
   - Closed Exams
3. Fill in the search term in the text field and click **Search**. The search result is displayed.

   Filling in first part of the search term will show all results starting with that part. Use * as wildcard in front of the Patient name and Patient ID to search without knowing the first part of the name/ID.

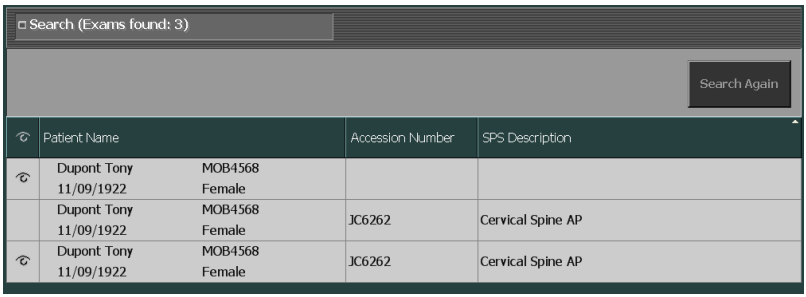


Figure 64: Search results in Search pane

4. Open the exam by double-clicking it.

   Refer also to “Starting an exam from the Worklist”.

   The exam is displayed in the Examination window.

Note: To perform another search, click Search Again.

Related Links

Starting an exam from the Worklist on page 112
About Examination on page 128

Transferring images from one exam to another

Procedure:

1. In the **Worklist** window, select the exam from which you want to transfer the images. The images are displayed in the **Image Overview** pane.
2. Click **Transfer Images**.

   The **Transfer Images** wizard opens:

Figure 65: Transfer Images wizard view 1

3. In the **Image Overview** pane, select the image(s) that you want to transfer.

   The image is displayed in the wizard.
4. Click **Continue**.
5. In the **Worklist** pane, select the exam to which the image should be transferred.

   The patient data is displayed in the wizard.
6. Click **Continue**.

   A transfer overview is displayed to check if all information is correct.

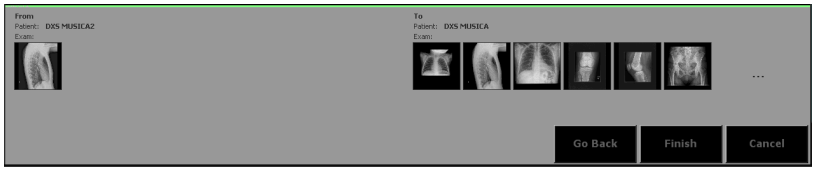


Figure 66: Transfer Images wizard view 2

7. Click **Finish**.

   The image is transferred.

Copying patient data into a new exam

Note: This is useful for sites without a RIS, when you want to create several separate studies of the same patient.

You can create a new exam for a patient that has already had a previous exam by taking the following steps:

1. Select an exam of the patient in the Worklist window.
2. Click the **Reuse Patient Data** button.

   The **Examination** window opens, with the patient information already completed, but with blank exam data:

Figure 67: Reuse Patient Data in Examination window

3. Enter all the information that is needed for the exam.
4. When the images are made, finalize the exam.

Note: The accession number will not be copied as this is related to the examination.

Related Links

Preparing the exam for identification on page 140
Finalizing the exam after the images have been received on page 144

Managing the worklists

Note: The available worklists depend on the configuration in the NX Service and Configuration Tool. Refer to the Key user manual for more information.

You can manage the worklists by clicking the **Manage Lists** button. The **Manage Lists** window opens:

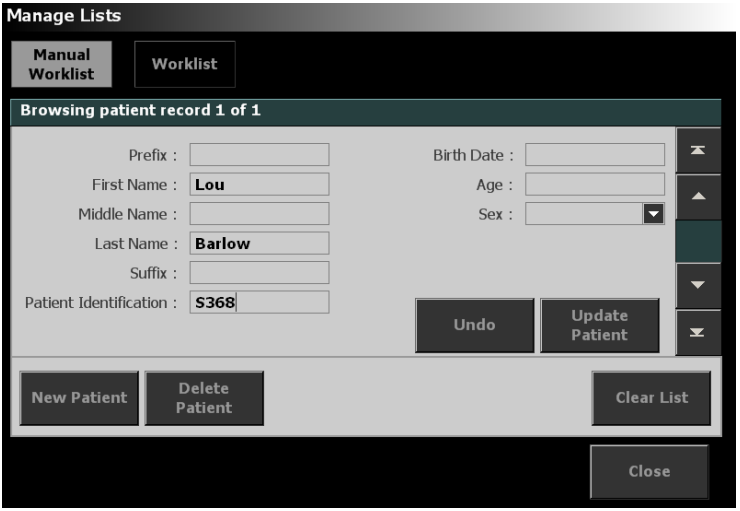


Figure 68: Managing Lists window

Depending on the configuration, you have the choice between:

- Managing the Manual worklist
- Managing the RIS-based worklist

Topics:

- *Managing the Manual worklist*
- *Managing the RIS-based worklist*

Managing the Manual worklist

Procedure:

Press the **Manual Worklist** button on the top left of the screen.

The window shows the first record of the list. You can scroll in the list with the scroll buttons on the right side:

Scroll Button	Functionality
	Move to the top of the list.
	Move up the list one entry.
	Move down the list one entry.
	Move to the bottom of the list.

Related Links

About Examination on page 128

Topics:

Changing information of a record

1. In the Manage Lists window, browse to the patient record that you want to change.
2. Change the information in the text fields.
3. Click **Update Patient**.
4. Click **Close**.

   The information in the **Manual Worklist** is updated.

Creating a new patient

1. Click **New Patient**.

   A new record is created.

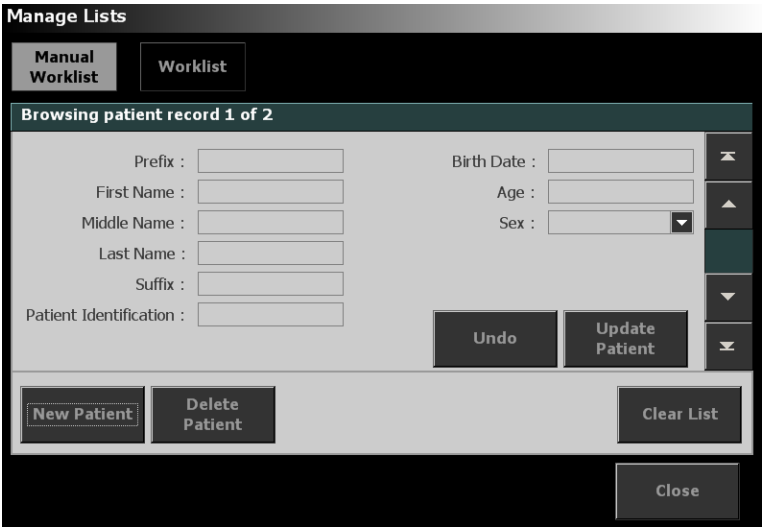


Figure 69: Creating a new patient

2. Enter the patient information in the text fields.
3. Click **Close**.

   The new patient is added to the patient list.

Deleting a patient

1. In the Manage Lists window, browse to the patient record that you want to delete.
2. Click **Delete Patient**.
3. Click **Close**.

   The patient is removed from the **Worklist**.

Clearing the entire Worklist

1. In the Manage Lists window, click **Clear List**.
2. Click **Close**.

   The **Worklist** is empty.

Managing the RIS-based worklist

Procedure:

1. Press the **Worklist** button on the top left of the screen.
2. Enter the criteria to which the RIS entries should match that are listed in the NX Worklist.

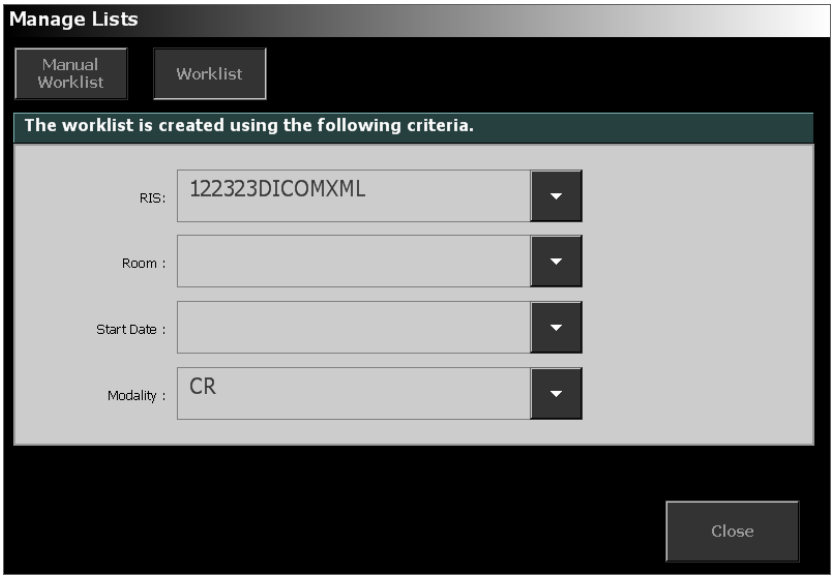


Figure 70: Manage Lists window

3. Click **Update Worklist**.
4. Click the **Close** button.

Opening an application, folder or file

In every NX environment, you can open an external application, folder or file with an action button for that purpose. The application, folder or file can be configured differently for each environment.

To open an application, folder or file:

Click the Open application, folder or file action button.

Note: *This button can have any caption. The caption and the object to be opened are configured in the NX Service and Configuration Tool.*

Examination

Topics:

About Examination

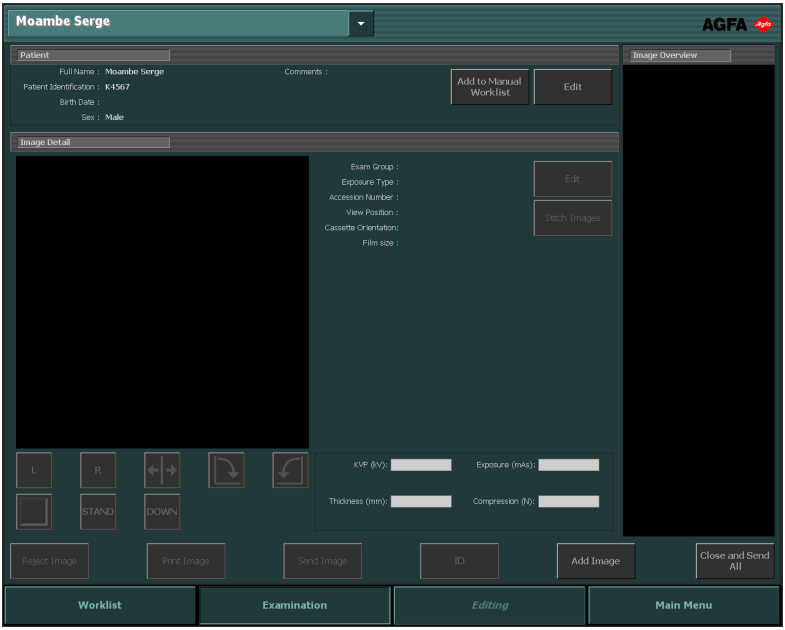


Figure 71: Examination window

In the **Examination** window, you can view and manage the details of a specific exam. This window is designed to be used by touch screen, simply touch the active area of the screen to activate a function or perform a selection.

The drop-down list in the title bar of the window shows the name of the patient for which the exam is performed. If there is another exam open, you can select another name from the list to display the exam of the patient.

Note: *The image will be displayed as it will appear on the print sheet. In case of true size printing, the edges of the image may not be visible. In order to see the full image, use the zoom tools in the editing screen.*

Note: *If the*  *icon is displayed next to the patient name in the drop-down, the same examination is being looked at on an NX Central Monitoring System. If someone else is making changes to the same image or exam data, at the same time, some of your changes may be undone by the other user.*

Note: *There may be a short delay between making changes to an image/exam on the In-room NX workstation and seeing these changes on Central Monitoring System and vice-versa.*

The **Examination** window has three panes:

- Patient pane: a list of general information about the patient.
- Image Detail pane: a detailed image with a list of information. This pane also allows you to perform basic operations on the image.
- Image Overview Pane: a thumbnail overview of the images that are included in the exam.

At the bottom of the window, you can also find several action buttons to perform specific actions.

Note: *The available buttons depend on the configuration in the NX Service and Configuration Tool. Refer to the Key user manual for more information.*

Related Links

Using Examination on page 139

Topics:

Patient pane

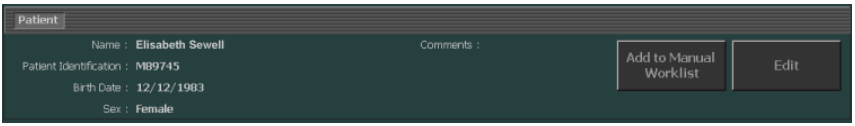


Figure 72: Patient pane

The **Patient** pane displays the general information about the patient:

- The **Patient Name**
- The unique **Identification** of the patient
- The **Birth Date** and **Sex**
- Additional **Comments**

Note: *The comments text box can be clicked to display its complete contents. Click the X-button to return to the normal view.*

Note: *The patient pane can be configured to display 8 fields in total.*

In this pane, the following actions are possible:

- “Editing patient data”.
- “Adding a patient to the Manual Worklist”.

Note: *The available action buttons depend on the configuration in the NX Service and Configuration Tool. Refer to the Key user manual for more information.*

Image Detail pane

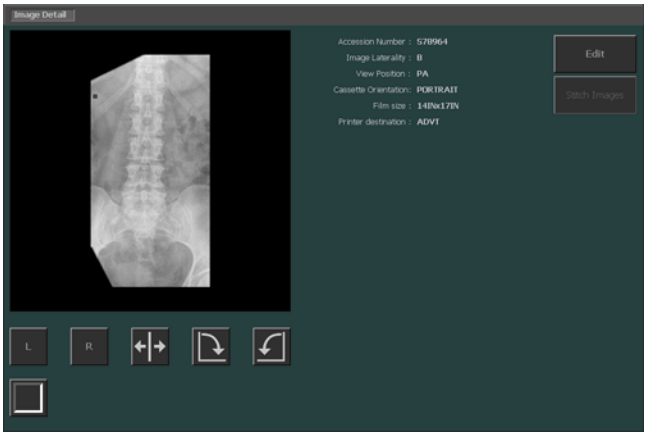


Figure 73: Image Detail pane

The **Image Detail** pane displays detailed information about the images of an exam. When you select an image in the **Image Overview** pane, the image is displayed in the **Image Detail** pane with detailed data.

The way the image is displayed depends on the status of the exam.

Before the exposure	The image is planned. A small description is displayed. If configured, a positioning guidance image and guidance text for making the exposure is displayed.
Right after the exposure	The image is being acquired. A preview image is displayed.
After the exposure	The image is acquired. The processed image is displayed.

For each image, a number of descriptive fields are displayed, depending on the configuration. As an example, the following fields can be displayed:

- **Exam Group, Type**: the body part and exam type.
- **Accession Nr.**: the reference number of the exam.
- **View Position**: the position of the patient relative to the modality.
- **Cassette Orientation**: the orientation of the digitizer cassette.
- **Image Comment**: additional comments on the image.

Note: *The available fields depend on the configuration in the NX Service and Configuration Tool. Refer to the Key user manual for more information.*

Additionally, this pane can also display the dose deviation bar. If the dose level is higher than the reference, the horizontal bar will extend to the right from the middle of the scale, and a lower level causes the bar to extend from the middle to the left. Tick marks are positioned at intervals that indicate a change in dose of a factor two. A deviation indication on the first tick mark to the right means twice the reference dose. A deviation indication on the first tick mark to the left means half the reference dose.

Figure 74: Image with Dose Deviation bar in the lower right corner.

In this pane, the following actions are possible:

- “Editing patient data”.
- “Performing quality control on the image”.

Related Links

Image Overview Pane on page 133

Image Overview Pane

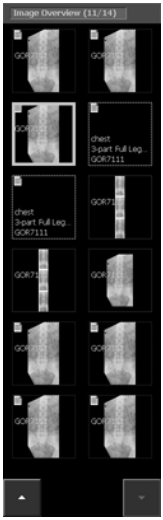


Figure 75: Image Overview pane

In the **Image Overview** pane, an overview of the images of the selected exam in the **Worklist** or **Closed Exam List** pane is displayed.

The title indicates the number of images taken and the total number of images in the exam.

If the exam consists of more than 12 images then the following buttons will be displayed at the bottom of the pane. They can be used to navigate through the thumbnails.

The images are displayed in several ways, as shown in the next table:

Image	Description
	The image is planned, but not yet treated by the modality. A small description is displayed.

Image	Description
	The cassette is identified (exam data are written to cassette).
	The image is taken and is waiting to be approved and printed.
	The status icons indicate that an image was successfully sent out.
	the image is written to CD/DVD 
	the image is sent to an archive 
	the dose report is sent to the configured destination(s) 
	the image is printed 
	Depending on your workflow (CD/DVD, print or archive oriented), one or more of the icons will appear. They appear after a **Close and Send All** action, writing the image to CD/DVD, or if you have manually printed or sent images from an open exam.

Problem statuses are displayed as shown in the table beneath:

Image	Description
	The RIS provided a protocol code that cannot be automatically translated into planned images by NX. Usually, this means that the code is unknown to NX, but it could also occur when the patient's birth date is not known. Clicking this thumbnail will immediately take you to the Examination window where you are asked to add an image, in order to resolve the planned image.
	The image was sent to an archive and a printer but both failed.
	The image is rejected.
	The image is not assigned to a sheet.

Modality statuses are displayed as shown in the table beneath:

Image	Description
X-Ray modality settings	
	The exposure has been performed and NX has received the exposure parameters from the X-Ray modality.
DR system - indication of selected acquisition system	

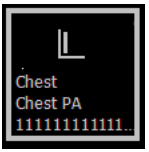
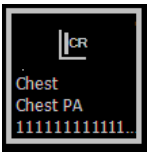
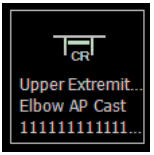
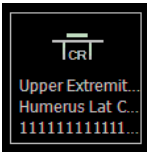
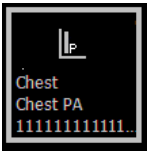
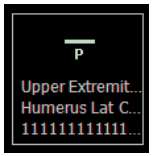
Image	Description
	The image is planned for the radiographic wall stand using the DR bucky.
	The image is planned for the radiographic table using the DR bucky.
	The image is planned for the radiographic wall stand using the catapult bucky for CR cassettes.
	The image is planned for the radiographic table using the catapult bucky for CR cassettes.
	The image is planned as a free exposure using a CR cassette.
	The image is planned for the Portable DR Detector inserted in the radiographic wall stand bucky.

Image	Description
	The image is planned for the Portable DR Detector inserted in the radiographic table bucky.
	The image is planned as a free exposure using the Portable DR Detector.

Action buttons

Examination has several action buttons to perform specific actions. The following table gives a short description of their functionality:

Button	Functionality
Reject Image	Rejects or unrejects an image
Prior Images	Go to previous examinations.
Print Image	Prints specific exam images
Send Image	Archives specific exam images
ID	Identifies a cassette
Copy Exposure	Copies exposure settings into a new exposure
Add Image	Define additional images manually
Close and Send All	Closes the exam and sends all images to a printer or to a PACS archive
Open application, folder or file	Open an external application, folder or file

Related Links

Rejecting/unrejecting an image on page 147
Go to the prior images of a patient on page 148
Printing images on page 151
Archiving images on page 153
Identifying a cassette on page 142
Defining exposures on page 140
Closing the exam and sending all images on page 149
Opening an application, folder or file on page 126

Using Examination

Topics:

Preparing the exam for identification

Topics:

Defining exposures

If protocol codes are not provided by the RIS, images need to be added manually. It is up to you as a radiographer which images need to be done.

Adding exposures manually can be needed in many situations:

- You can add images to an existing exam, for example when those enforced by the RIS are not sufficient.
- You might need to add all images for an exam manually, for example when protocol codes were not sent by the RIS.
- You can add images for a new patient or emergency patient.
- When no RIS is available or when it is down.

Related Links

Starting an emergency exam on page 116
Starting a new exam on page 112
Starting an exam from the Worklist on page 112

Topics:

Adding exposures

1. Select the exam in which you want to add images manually.
2. Click **Add Image**.

   The following window appears.

Figure 76: Add Image window

3. Specify the exam group and exam type by clicking on the buttons.
4. Click **OK**.

   The exposure is added to the exam and is displayed in the **Exam Overview** pane.

   On a DR system the exam types indicate on which acquisition system the exposure is planned:

Image	Description
	Radiographic table using the catapult bucky. for CR cassettes.
	Radiographic wall stand using the catapult bucky for CR cassettes.
	Free exposure using a CR cassette.
	Radiographic table using the DR bucky.

Image	Description
	Radiographic wall stand using the DR bucky.
	Portable DR Detector inserted in the radiographic table bucky.
	Portable DR Detector inserted in the radiographic wall stand bucky.
	Free exposure using Portable DR Detector.

Copying DR exposure settings into a new exposure

1. Select the exam in which you want to add an image by copying exposure settings.
2. Select the correct thumbnail in the Exam Overview pane.
3. In the Examination window, click Copy Exposure

   The exposure is added to the exam and is displayed in the Exam Overview pane.

Copying CR exposure settings into a new exposure

Identify a cassette using an exposure that is already identified or acquired.

Identifying a cassette

The procedure for selecting and performing X-Ray exposures depends on the configuration settings of the NX, the digitizer and the connectivity to the X-Ray modality.

Related Links

Selecting and Performing X-Ray Exposures on page 71

Editing patient data

To edit the information of a patient, take the following steps:

1. With the information of the patient you want to edit displayed, click **Edit**.

   The **Edit patient pane** opens on top.

   Figure 77: Edit patient pane

2. Change the information in the text fields and click **OK**.

Note: *The comments text box can be double-clicked to display and edit its complete contents. Click the V-button to confirm the changes and return to the normal view.*

Note: *This list of editable fields depends on the configuration of NX.*

Adding a patient to the Manual Worklist

To add a patient to your personal Manual Worklist, select the patient and click **Add to Manual Worklist**. The patient is then automatically added.

Note: *A record in the Manual Worklist is not unique. This means that you can add a patient to the list several times. If you want to add a patient, check whether the patient is already in the list.*

Related Links

Manual Worklist pane on page 106

Changing specific image settings

Image settings can be changed. The list of editable fields depends on the configuration of NX.

Most settings can be changed before or after acquisition of the image, to apply exposure settings that are different from the default settings. Examples:

- Exposure type
- View position
- Image laterality
- Cassette orientation

Some settings can only be changed before identification of the cassette. Examples:

- Speed class of a cassette
- Scan resolution

To edit the image details, take the following steps:

1. Make sure the image you want to edit is selected.
2. Click **Edit**.

   The **Edit Image Detail** pane opens on top.

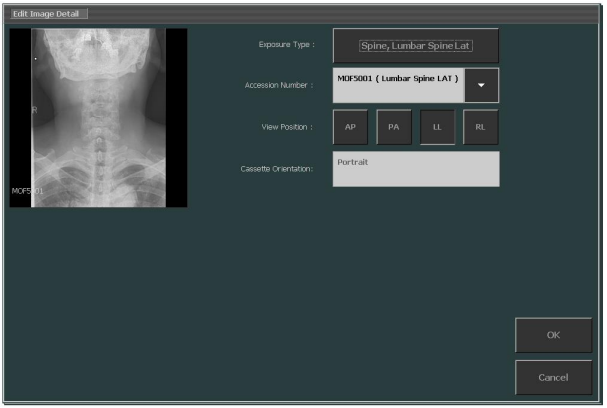


Figure 78: Edit Image Detail pane

3. Edit the settings in the displayed fields.
4. Click **OK** to apply the changes.

Note: *If you change the View Modifier Code of a Mammography image, the image processing is not changed. Also select the right Exposure Type for the image.*

Note: *The available buttons depend on the configuration in the NX Service and Configuration Tool. Refer to the Key user manual for more information.*

Finalizing the exam after the images have been received

- Performing quality control on the image
- Rejecting/unrejecting an image
- Go to the prior images of a patient
- Closing the exam and sending all images
- Selecting the correct examination after the image has been received
- Printing images
- Archiving images

Topics:

Performing quality control on the image

The **Image Detail** pane has a set of buttons to perform basic operations on an image. The following table explains the functionality of each button:

Button	Functionality
 **Figure 79: Left Marker button**	Adds a left marker. Click the button, and then click the image where you want to place the marker. To remove the marker, select it and then press the **Delete** button.
 **Figure 80: Right Marker button**	Adds a right marker. Click the button, and then click on the image where you want the place the marker. To remove the marker, select it and then press the **Delete** button.
Note: L-R markers can be changed to your local language, but they must be used to indicate 'Left' and 'Right', as it can impact other settings, because adding a left or right marker on an image with laterality 'both' changes the laterality of the image to 'left' respectively 'right'. **Note**: Once the laterality of the image has been set, deleting the marker or adding another marker will not affect the laterality. Change laterality in the Edit Image Detail Pane.	
 **Figure 81: Flip button**	Flips the image from left to right.

Button	Functionality
 **Figure 82: Rotate Counterclockwise button**	Rotates the image counterclockwise.
 **Figure 83: Rotate Clockwise button**	Rotates the image clockwise.
 **Figure 84: Freehand rotate button**	Rotates the image by an arbitrary angle.
 **Figure 85: Black Border button**	Masks non-relevant areas of the image with black borders. Click the button to apply black borders. Turns on or off the cropping of the non-relevant image areas of DR images or CR 10-X images.
 **Figure 86: Stitch button**	NX allows you to combine the separate images of a full leg or a full spine study into a continuous composite image. The software automatically corrects for any distortion or misalignment and calculates a composite image with geometric continuity of body parts. If necessary, you can manually fine-tune the automatically calculated composite image. The composite image can be saved as a new image. Remember, full leg full spine images are shown with a dashed border in the Image preview pane.

Button	Functionality
 **Figure 87: Full Screen button.**	Switches the active image to full screen mode.
 **Figure 88: High Priority Marker button.**	Enables you to put a high priority marker on the image. The image gets the highest priority in the printing and archiving queues and a high priority DICOM attribute that can be used to make a selection on the archiving station.

Note: *You can use more extensive tools to prepare the image for diagnosis in the Editing window.*

Related Links

Stitching Full Leg Full Spine images on page 154
About Editing on page 159

Rejecting/unrejecting an image

By rejecting an image you indicate that the image is not suitable for diagnosis and that a retake is needed. Rejecting an image does not remove the image from the exam.

Unrejecting an image lets you recall your decision to reject the image (e.g. after consulting a radiographer).

Note: *You can only indicate a reject reason if the Reject Analysis license is activated.*

Topics:

- *Rejecting an image*
- *Unrejecting an image*

Rejecting an image

1. Select the image in the **Image Overview** pane.

The image is displayed in the **Image Detail** pane.

2. Click **Reject Image**.

   The Reject Reason dialog box opens where you can select a reason to reject the image.

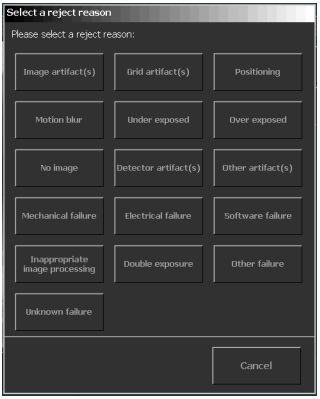


Figure 89: Reject Reason dialog box

3. A new image thumbnail is created for repeating the exposure.

   A sign is displayed on the image and the thumbnail. The **Reject Image** button changes to **Unreject Image**.

Unrejecting an image

1. Select the image in the **Image Overview** pane.

   The image is displayed in the **Image Detail** pane.

2. Click **Unreject Image**.

   The sign is removed. The **Unreject Image** button changes to **Reject Image**.

Note: Rejected images will not be sent to the configured destination (printer or PACS) when you click 'Close and Send All'.

Go to the prior images of a patient

Procedure:

Click **Prior Images**.

A web browser will be opened and the Web 1000 interface will be shown. There you can browse to the prior images of the patient.

Closing the exam and sending all images

When an exam is closed, the images are sent to a printer or to a PACS archive if configured in the NX Service and Configuration tool. Which destination will be chosen, can be set in the NX Service and Configuration Tool. For more information, refer to the NX Key User Manual.

To close an exam, take the following steps:

1. Select the exam that you want to close from the title bar of the **Examination** window.
2. Click **Close and Send All**.

   The examination is placed in the **Closed Exam** pane. Images which have not yet been sent manually are sent to the destination.

Related Links

Closed Exams pane on page 104
Closed Exams pane on page 104

Selecting the correct examination after the image has been received

Note: *Image data can be edited even before the image is digitized and processed by the assigned exposure parameters. To do this, select the image thumbnail.*

To edit image data:

1. Make sure the image you want to edit is selected.
2. In the **Image Detail** pane, click **Edit**.

   The **Edit Image Detail** pane opens on top.

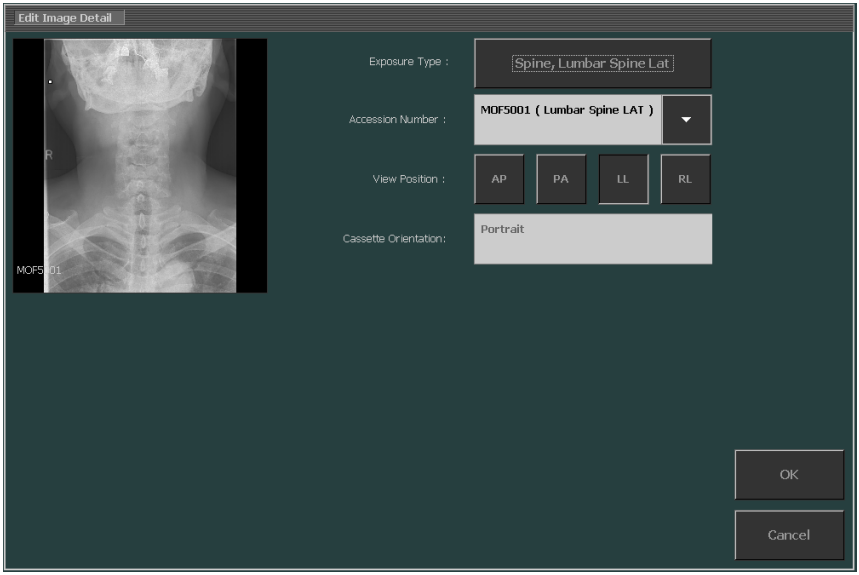


Figure 90: Edit Image Detail pane

3. To change the **Exposure Type**, click the button displaying the exam/ exposure name.

   This brings up the Add Image pane where you can select the new exam/ exposure type.

   Note: *If the exposure has been identified for a mammography cassette type, only mammography examinations can be selected.*

Figure 91: Add Image pane without selection of Examination group

4. First select the Examination group.
5. Select an exposure. This will bring you back to the Image Detail pane.

Note: In exceptional cases the Edit Exposure pane will not contain any exposures. The Escape button can be used to return to the Edit Exposure pane.

Note: Changing the exam/exposure type will change all associated parameters: MUSICA processing, default W/L, view position, etc.

Related Links

Changing specific image settings on page 143

Printing images

Topics:

- *Printing a specific image before the examination is completed*
- *Printing all images of an examination in one go*
- *Printing images of different exams on one sheet*

Printing a specific image before the examination is completed

1. Select the image that you want to print by clicking it in the **Image Overview** pane.

2. Click **Print Image**.

   The image is printed. A printer icon appears on the image in the **Exam Overview** pane.

Printing all images of an examination in one go

Press **F7** on the keyboard.

All images of the current examination will be printed.

The exam status will not change (open examinations remain open).

Note: You can also print a complete exam with the Close and Send All button.

Related Links

Closing the exam and sending all images on page 149

Printing images of different exams on one sheet

1. Press **F6** on the keyboard.

   The Multi Exam Sheet window opens.

Figure 92: Multi Examination Print Sheet.

2. Select the Print layout you want to use for printing the sheet.
3. Select an image from any environment and drag and drop it on a cell in the print sheet.
4. Select another image from any environment or any examination and drag and drop it on another cell in the print sheet.

5. If you have finished the composition, press **Print**.

Note: You can open the Multi Exam Sheet from any environment. Just press F6 to open the window.

Related Links

Changing the layout you want to print on on page 236

Archiving images

You can archive images by sending them to a preconfigured PACS archive. When sending only one image of an exam, the exam will not be closed.

Topics:

Archiving a specific image before the examination is completed

1. Select the image that you want to archive by clicking it in the **Image Overview** pane.
2. Click **Send Image**.

   The image is archived.

Note: You can also archive and close a complete exam with the Close and Send All button.

Note: You can send images to a destination of your choice in the Editing window.

Related Links

Closing the exam and sending all images on page 149
Archiving images on page 177

Archiving all images of an examination in one go

Press F8 on your keyboard.

All images of the current examination will be archived.

The exam status will not change (open examinations remain open).

Note: You can also archive a complete exam with the Close and Send All button.

Related Links

Closing the exam and sending all images on page 149

Stitching Full Leg Full Spine images

For more background on the Full Leg Full Spine option, refer to the Full Leg Full Spine option for NX Workstations User Manual.

Topics:

Workflow for DR Full Leg Full Spine examinations

Procedure:

1. Add the Full Leg Full Spine (DR FLFS) exposure set to the exam.
2. Select the thumbnail for the exam and click Start FLFS.
3. After the last image is received on the Workstation, an extra image is created in the exam, containing the stitched FLFS image.
4. If there is a problem with the stitched image, refer to section “Manually adjusting a DX-D Full Leg Full Spine image” in the DX-D Full Leg Full Spine User Manual. Here you can read how the stitching process can be fine-tuned.

Workflow for CR Full Leg Full Spine examinations

Procedure:

1. Add the Full Leg Full Spine (FLFS) exposure set to the exam.
2. Identify the cassettes top-down.
3. Put the cassettes in the digitizer.
4. After the last image is received on the Workstation, an extra image is created in the exam, containing the stitched FLFS image.
5. If there is a problem with the stitched image, refer to section “Manually creating a composite CR Full Leg Full Spine image”. Here you can read how the stitching process can be fine-tuned.

Related Links

Manually creating a composite CR Full Leg Full Spine image on page 155

Manually creating a composite CR Full Leg Full Spine image

Before you begin, read the chapter “Safety precautions concerning Full Leg Full Spine functionality” very carefully.

You can manually create a composite Full Leg Full Spine image and save it as a new image in the exam by taking the following steps:

Procedure:

1. Select one of the FLFS images.
2. Click **Stitch Images**.

   The **Stitch Images** dialog opens. In this dialog, you can see all the FLFS images that are part of the exposure.

Figure 93: Stitch Images dialog box

3. Use one of the buttons to perform an action on the image.

Button	Functionality
	Removes the image from the exposure.
	Rotates the image to the left or right.

Button	Functionality
	
 	Moves the image up or down.
	Rotates all images 180°.

4. To remove a wrong image from the FLFS stitching screen, click the remove button next to the image or drag it to the **Image Overview** pane. The image box becomes empty.
5. To add an image that is part of the FLFS exposure and that does not appear in the stitching screen, first select the thumbnail of the image in the image overview pane and then click the empty image box in the FLFS stitching screen. You can also drag it to the Stitching Screen.
6. Once the orientation of the images is correct, click **Stitch Images**.

   The second **Stitch Images** dialog opens, where the images are stitched together.

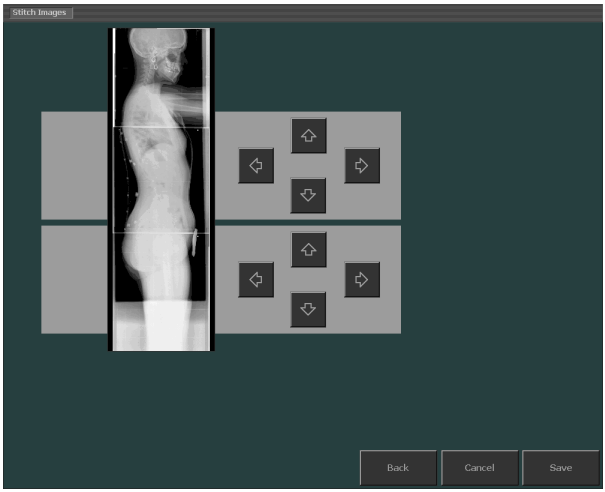


Figure 94: Second Stitch Images dialog

Note: The top FLFS cassette should be identified first. When using the FLFS cassette holders as it is intended, stitching and exposing will be correct, so no repositioning will be needed.

7. Use the arrow buttons to place the images in the correct position.
8. Click **Save**.

   The stitched image is saved as a new image in the exam.

Related Links

Safety precautions concerning Full Leg Full Spine functionality on page 46

Editing

Topics:

About Editing

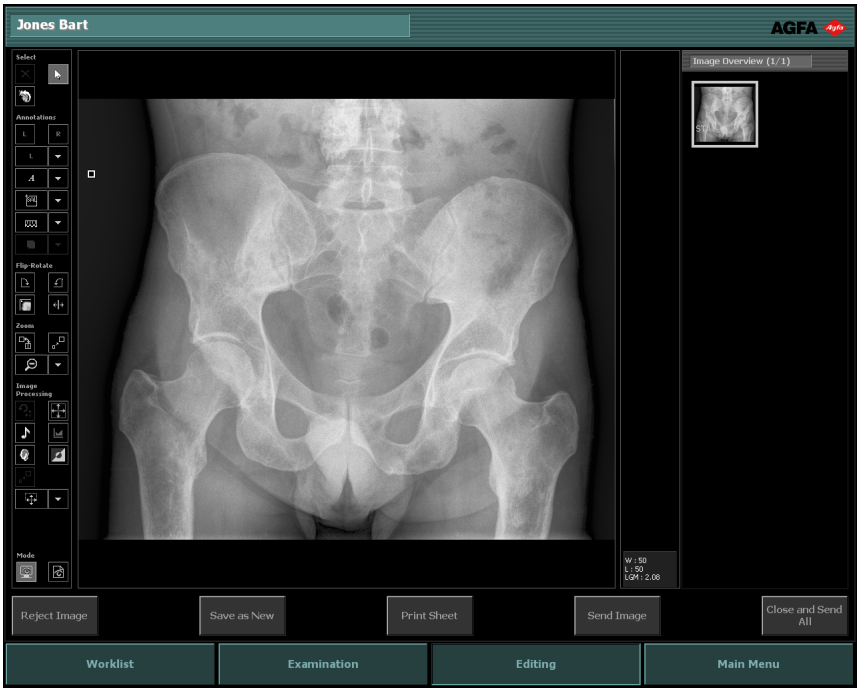


Figure 95: Editing window in Normal mode

In the **Editing** window, you can perform in-depth operations on an image. The left toolbar can be configured for use by mouse pointer or by touch screen. For annotations that require precise positioning on the image, the use by mouse pointer is the most efficient.

Note: If the  *icon is displayed next to the patient name, the same examination is being looked at on an NX Central Monitoring System. If someone else is making changes to the same image or exam data, at the same time, some of your changes may be undone by the other user. There may be a short delay between making changes to an image/exam on the In-room NX workstation and seeing these changes on Central Monitoring System and vice-versa.*

The **Editing** window has two modes:

- Normal mode: In this mode Print tools are not available, it is focussed on softcopy users.
- Print mode: In this mode print tools are added to the tool pallet, images are displayed in a WYSIWYG print preview.

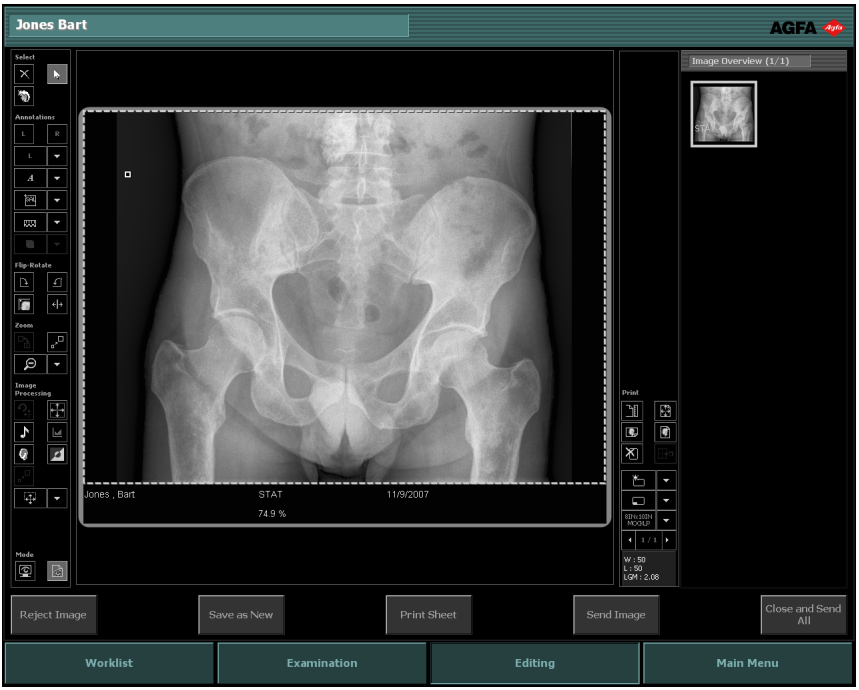


Figure 96: Editing window in Print Mode

Note: *The image will be displayed as it will appear on the print sheet. In case of true size printing, the edges of the image may not be visible. In order to see the full image, use the zoom tools in the editing screen.*

The following tool sets are available in both modes. The tools are displayed in several task-specific sections:

- **Select**: general tools to manage the images.
- **Annotations**: add annotations to images.
- **Flip-Rotate**: change the geometry of images.
- **Zoom**: change the view of an image.
- **Image Processing**: tools to process images.

The **Print** mode has an additional tool set to prepare the image for printing.

An overview of all the images in an exam is always displayed on the right side of the window, in the **Image Overview** pane.

Depending on the mode you are in, when selecting an image in the **Image Overview** pane, the image will be displayed in the display area (Normal Mode) or the print area (Print Mode).

At the bottom of the window, you can also find several action buttons.

Related Links

Selecting images on page 169
Adding annotations to an image and using the measurement tools on page 179
Rotating or flipping an image on page 202
Zooming in or out on an image on page 208
Processing images on page 216
Printing images on page 235

Topics:

Normal mode

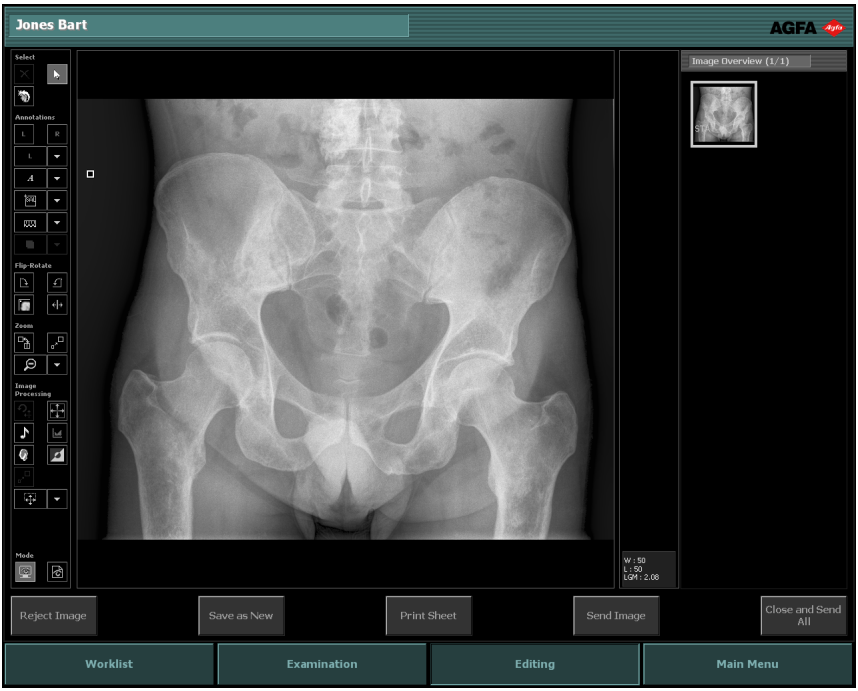


Figure 97: Editing Window in Normal mode

The **Normal** mode allows you to select an image of a study in the Image Overview Pane, display it in detail and make modifications to it.

It contains three main parts:

- A set of tools to perform advanced processing on an image. The tools are grouped in several task-specific sections:

- Selecting images
- Adding annotations to an image and using the measurement tools
- Rotating or flipping an image
- Zooming in or out on an image
- Processing images
- An area where the selected image is displayed.
- The Image Overview pane, where you select the image that will be displayed. For more information, see below.

Image Overview pane

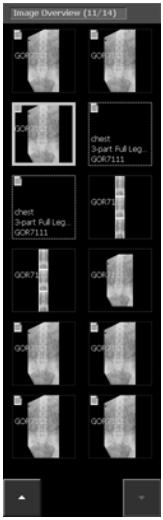


Figure 98: Image Overview pane

In the **Image Overview** pane, an overview of the images in the exam is displayed when an exam is selected in the **Worklist** or **Closed Exams** pane.

The title indicates the number of images taken and the total number of images in the exam.

If the exam consists of more than 12 images then the following buttons will be displayed at the bottom of the pane. They can be used to navigate through the thumbnails.

The images are displayed in several ways, as shown in the next table:

Image	Description
	The image is planned, but not yet treated by the modality. A small description is displayed.

<table>
<tr><th>Image</th><th colspan="2">Description</th></tr>
<tr><td> 
</td><td colspan="2">The cassette is identified (exam data are written to cassette).</td></tr>
<tr><td>  </td><td colspan="2">The image is taken and is waiting to be approved and printed.</td></tr>
<tr><td rowspan="6"> 
</td><td colspan="2">The status icons indicate that an image was successfully sent out.</td></tr>
<tr><td>  </td><td>the image is written to CD/DVD</td></tr>
<tr><td>  </td><td>the image is sent to an archive</td></tr>
<tr><td>  </td><td>the dose report is sent to the configured destination(s)</td></tr>
<tr><td>  </td><td>the image is printed</td></tr>
<tr><td colspan="2">Depending on your workflow (CD/DVD, print or archive oriented), one or more of the icons will appear. They appear after a Close and Send All action, writing the image to CD/DVD, or if you have manually printed or sent images from an open exam.</td></tr>
</table>

Note: *The border of partial full leg full spine thumbnails, of both the image and the exposure, is dashed.*

Related Links

Image Overview Pane on page 133

Print Mode (P)

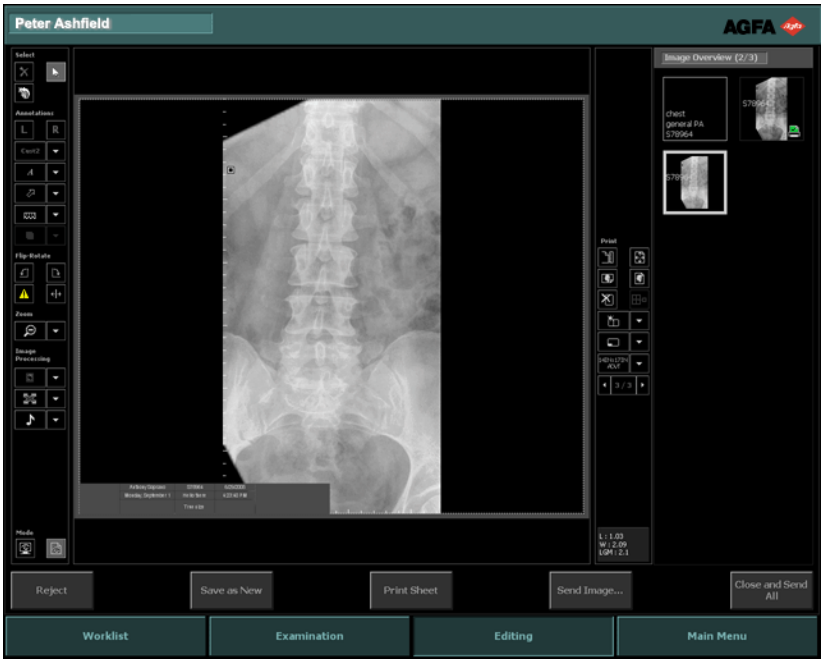


Figure 99: Editing window in Print Mode

The **Print** mode allows you to select an image of a study in the **Image Overview** Pane, display it to the print area and make modifications to prepare it for printing.

It contains four main parts:

- A set of tools to perform advanced processing on an image. The tools are grouped in several task-specific sections:

- Selecting images
- Adding annotations to an image and using the measurement tools
- Rotating or flipping an image
- Zooming in or out on an image
- Processing images
- A print area where images are displayed on the print sheet. Multiple images can be displayed on one sheet. You can browse between the sheets with the arrow buttons below the print tool section.
- A set of specific print tools to define the printing settings of the images.
- The **Image Overview** pane, where you click the image that you want to print and drag it to the print area. For more information, see below.

Note: *Thumbnails can be dragged from the Image Overview pane to an image cell.*

Related Links

Printing images on page 235

Action buttons

Editing has several action buttons to perform specific actions. The following table gives a short description of their functionality:

Button	Description
Reject	Rejects an image
CATH	Adds a copy of the image to the exam with a dedicated processing applied to enhance visibility of catheters
Save as New	Saves an image as new
Print Sheet	Prints the image
Send Image	Places the image in an archive
Close and Send All	Closes the exam and sends all images to a printer or to a PACS archive
Open application, folder or file	Open an external application, folder or file

Related Links

Rejecting/unrejecting an image on page 147
Saving a processed image as new image with enhanced visibility of catheters on page 174
Saving a processed image as new image on page 175
Printing the images of a print sheet on page 176
Archiving images on page 177
Closing the exam and sending all images on page 178
Opening an application, folder or file on page 126

Selecting images

- “Selecting an object on the image”
- “Removing image objects”
- “Reverting to the original image”
- “Rejecting/unrejecting an image”
- “Saving a processed image as new image with enhanced visibility of catheters”
- “Saving a processed image as new image”
- “Printing the images of a print sheet”
- “Archiving images”
- “Closing the exam and sending all images”

Topics:

Selecting an object on the image

Figure 100: Select button

To select an object on an image (for example: an annotation):

1. Select an image in the **Image Overview** pane.
2. Click on the following icon.

3. Click on the object to select it.

Removing image objects

Figure 101: Remove button

To remove an object (for example: an annotation) from an image:

1. Select an image in the Image Overview pane.
2. Select the object.
3. Click on the icon or press the Delete button.

The object is now removed.

Reverting to the original image

Figure 102: Revert button

Click this icon to revert the image to its original state. This is the state in which it was sent by the modality.

Note: *When pressing the Revert To Original image button, all changes will be lost.*

Rejecting/unrejecting an image

Related Links

Rejecting/unrejecting an image on page 147

Saving a processed image as new image with enhanced visibility of catheters

The 'CATH' option allows you to create a copy of the image with a dedicated processing applied to enhance visibility of catheters.

Note: *The availability of this option depends on the exposure type and on the configuration in the NX Service and Configuration Tool. Refer to the Key user manual for more information.*

To save a processed image as a new image with enhanced visibility of catheters:

1. Select an image in the **Image Overview** pane.
2. Click **CATH** (a copy is created with dedicated processing).

   The new image contains a marker and a comment to indicate that a dedicated image processing is applied.

WARNING:
These images should only be used for the purpose of enhanced viewing of catheters.

Saving a processed image as new image

The 'Save as new' option allows you to create copies of the same image, e.g. one processed for soft tissue, another processed for bone structure.

To save a processed image as a new image:

1. Select an image in the **Image Overview** pane.
2. Click **Save as New** (a copy is created).
3. Select the copy.
4. Reprocess the image.

Printing the images of a print sheet

To print all images of a print sheet:

1. Open the exam in **Print** mode.
2. Select the image of your choice by browsing through the print sheets of the exam with the arrow buttons below the printing tool section.

   The image is displayed in the print area.
3. Click **Print Sheet**.

   The sheet is printed. A printer icon will appear on the images in the **Exam Overview** pane.

Note: You can also print a complete exam with the Close and Send All button.

Note: Printing all images of an exam or printing images from multiple exams on one sheet is also possible. Refer to "Printing images".

Related Links

Print Mode (P) on page 166
Closing the exam and sending all images on page 149
Printing images on page 235

Archiving images

You can archive images by sending them to an archiving device. When sending only one image of an exam, the exam will not be closed.

To archive a specific image of an exam, take the following steps:

1. Click **Send Image**.

   The **Select a destination** window opens.

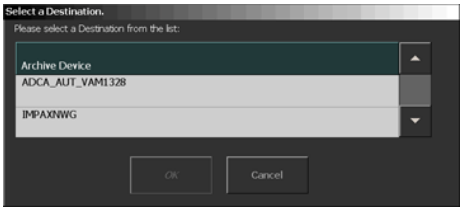


   Figure 103: Select Destination window

2. Select the **Archive Device** from the list and click **OK**.

   The image is archived.

*Note**:** You can also archive and close a complete exam with the Close and Send All button.*

Related Links

Closing the exam and sending all images on page 149

Closing the exam and sending all images

Note: *The destinations to which images are sent depend on the configuration in the NX Service and Configuration Tool. Refer to the Key user manual for more information.*

When an exam is closed, the images are sent to a printer or to a PACS archive (if configured).

To close an exam, take the following steps:

Click **Close and Send All**.

The images are sent to the printer or PACS archive. The exam is placed in the **Closed Exams** pane.

Adding annotations to an image and using the measurement tools

You can access the annotation functions in the **Annotations** section of the left tool bar.

After you have added an annotation, you can also edit or delete it.

Topics:

Adding a Left or Right marker

Figure 104: Left Marker button

Figure 105: Right Marker button

You can add a Left or Right marker to indicate which body side is displayed in the image by taking the following steps:

1. Select an image in the **Image Overview** pane.
2. Select the marker type:

Marker type	
L	Left marker. Click on the L-icon or select it from the following drop-down list in the Annotations tool section.
R	Right marker. Click on the R-icon or select it from the drop-down list in the Annotations tool section.

3. Click on the image where you want to place the marker.

   The marker appears on the image.

CAUTION:
Left-right markers can be misleading and can cause diagnosis to an incorrect patient area.

Adding a custom marker

To add a custom marker:

1. Select an image in the **Image Overview** pane.
2. From the following drop-down list in the **Annotations** tool section, select the marker.
3. Click on the image where you want to place the marker.

   The marker appears on the image.

CAUTION:
Overlapping markers can cause loss of diagnostic information.

Adding a high priority marker

A high priority marker is a marker type reserved for pointing images needing high priority attention. The image gets the highest priority in the printing and archiving queues and a high priority DICOM attribute that can be used to make a selection on the archiving station.

To put a high priority marker on an image:

1. Select an image in the **Image Overview** pane.
2. From the Marker drop down list, select the HPM marker button.

Figure 106: High Priority Marker button.

3. Click the location on the image where you want to place the marker.

   The marker is put on the image.

Figure 107: Image with High Priority marker on it.

Note: *The text of the caption of the high priority marker and the contents of the marker can be configured in the NX Service and Configuration tool.*

Adding text

You can either add custom text, or select from a number of predefined texts.

Topics:

Adding a freehand text

1. Select an image in the **Image Overview** pane.
2. From the text-annotation drop-down list in the **Annotations** tool section, select **A**.
3. Click on the image where you want to add the text.

   A text box is displayed.
4. Type the text and click anywhere with the primary mouse button or press Enter.

   The text is displayed on the image.

Adding predefined text

1. Select an image in the **Image Overview** pane.
2. From the text-annotation drop-down list in the **Annotations** tool section, select a predefined text.
3. Click on the image where you want to add the text.

   The text is automatically displayed.

Adding a time-text marker

A time-text marker (TTM) is a text marker that contains by default the time when the image was acquired.

To put a time-text marker on an image:

1. Select an image in the **Image Overview** pane.
2. From the Marker drop down list, select the TTM marker button.

   Figure 108: Time-text Marker button.

   A dialog is displayed that contains the time when the image was acquired.
3. If needed, modify the text and click **OK**.

4. Click the location on the image where you want to place the marker.

   The marker is put on the image.

Drawing a shape

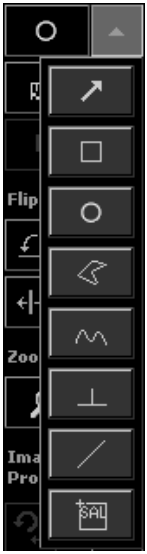


Figure 109: Drawing a Shape toolbar

You can indicate specific features in an image by drawing a shape. You can draw a circle, a polygon, an arrow, or a custom shape.

Topics:

- *Drawing a circle*
- *Drawing a rectangle*
- *Drawing a polygon*
- *Reshaping a shape*
- *Calculating the scan average level or pixel value index within a region of interest (ROI)*
- *Drawing a custom shape*
- *Drawing an arrow*

Drawing a circle

1. Select an image in the **Image Overview** pane.
2. From the drop-down list above in the **Annotations** tool section, select the following icon.

3. Click twice on the circumference of the circle you want to draw.

   The circle appears on the image, with an indication of its diameter and its area.
4. To define the position of the circle, move the pointer and click.

Drawing a rectangle

1. Select an image in the **Image Overview** pane.
2. From the drop-down list above in the **Annotations** tool section, select the following icon.

3. Click once to define the first corner.
4. Move the pointer and click to define the opposite corner.

Drawing a polygon

1. Select an image in the **Image Overview** pane.
2. From the drop-down list above in the **Annotations** tool section, select the following icon.

3. Click once to define the starting point.
4. Move the pointer and click to define each corner.
5. To close the polygon, click the starting point.

   The shape appears on the image, with a measurement of its area.

Reshaping a shape

1. Select a shape.
2. Drag one of the handles to a new position.

Calculating the scan average level or pixel value index within a region of interest (ROI)

1. Select an image in the **Image Overview** pane.
2. From the drop-down list above in the **Annotations** tool section, select one of the following icons.

The scan average level (SAL) or the pixel value index (PVI) or the Exposure Index (EI) of a default region of interest is displayed. You can move the region of interest or the SAL/PVI/EI label by dragging it. You can resize the region of interest or the SAL/PVI/EI label by dragging a sizing handle of the label.

Note: The default region of interest corresponds to a square of 4 cm². The centre of the square is positioned at 6 cm left of the right border of the image (= chestwall of mammo images with laterality = Right) and vertically centred.

Drawing a custom shape

1. Select an image in the **Image Overview** pane.
2. From the drop-down list above in the **Annotations** tool section, select the following icon.

3. Click once to define the starting point.
4. You can click as often as you need to approximate the shape you want to create.
5. To close the shape, click the starting point.

   The shape appears on the image, with a measurement of its area.

Drawing an arrow

1. Select an image in the **Image Overview** pane.
2. From the drop-down list above in the **Annotations** tool section, select the following icon.

3. Click once to define the shaft of the arrow, move the pointer, and click again to define the tip.

   After the last click a text box is shown via which the user can add text.

Drawing a line

You can indicate specific features in an image by drawing a line. You can either draw a straight line, or a perpendicular line.

Topics:

Drawing a straight line

1. Select an image in the **Image Overview** pane.
2. From the shape-annotation drop-down list in the **Annotations** tool section, select the following icon.

3. Click once to define the starting point of the line, move the pointer, and click again to define the end.

Note: You can snap the line to angles of 15 degrees using the CTRL key. Position the pointer on one end of the measurement, push CTRL and move the mouse up or down.

Drawing a perpendicular line:

1. Select an image in the **Image Overview** pane.
2. From the shape-annotation drop-down list in the **Annotations** tool section, select the following icon.

3. Click once to define the starting point of the base line, move the pointer, and click again to define the end.

   The perpendicular line appears.
4. To define the position of the perpendicular line, move the pointer and click.

Moving an annotation

1. Click the annotation.

   As a result, the annotation is activated.
2. Drag the annotation to a new position.

Rescaling an annotation

1. Click the annotation.

   As a result, the annotation is activated.
2. Drag one of the handles to a new position.

   The annotation is rescaled.

Adding calibration

Figure 110: Calibration toolbar

Procedure:

1. Click the Line or Circle Calibration button.

   The pointer is now a standard pointer and a ruler with a calibration bar.
2. For Line Calibration, click once to define the starting point of the calibration distance, move the pointer, and click again to define the end. For Circle Calibration, set three points on the circumference of the circle.

   The Calibration value window appears:

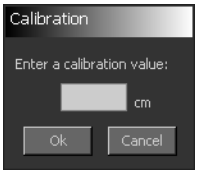


   Figure 111: Calibration value window
3. Type the value for the distance which you will use as calibration distance and click **OK**.

   The calibration distance is displayed in the upper left corner of the image. You can move the distance label by dragging it. You can resize the distance label by dragging a sizing handle of the label. All distances which you will measure will be referenced against the calibration distance.

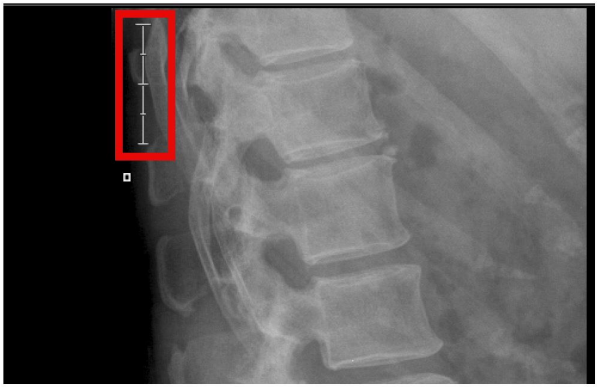


Figure 112: Calibration distance

For a calibrated image, the true scale printing factor in the status box will mention 'CAL' next to the scale factor. Also the scale factor in the film sheet text box will mention 'CAL'.

Adding an Estimated Radiographic Magnification Factor (ERMF)

Figure 113: Calibration toolbar

Procedure:

1. Click the ERMF button.

   The **ERMF Calibration** value window appears.

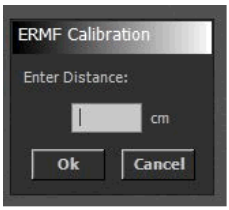


   Figure 114: ERMF Calibration value window

2. Type the value for the distance between the plane in which measurements are to be made and the detector and click **OK**.

   All distances which you will measure will be corrected by applying the Estimated Radiographic Magnification Factor and 'ERMF' will be mentioned next to the measured distance.

   The true scale printing factor in the status box of the image will mention 'ERMF' next to the scale factor. The scale factor in the film sheet text box will mention 'ERMF'.

Note: The Estimated Radiographic Magnification Factor can only be calculated if the Source Image Distance (SID) X-Ray parameter is stored on NX.

Making measurements

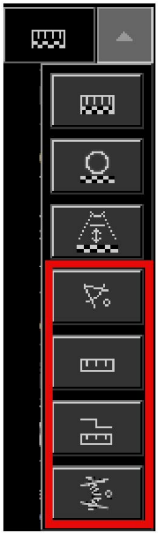


Figure 115: Measurement toolbar

You can measure the distance between specific features in an image. You can measure a distance, an angle, a height difference, or scoliosis.

Note: If you have not calibrated the distance measurement using a reference object in the image, the measurement is referenced against the image plate dimensions.

Related Links

Adding calibration on page 191

Topics:

Measuring a distance

1. Select an image in the **Image Overview** pane.
2. From the measurement drop-down list in the **Annotations** tool section, select the following icon.

3. Click once to define the starting point of the measurement, move the pointer, and click again to define the end.

   As you move the pointer, the distance between the starting point and the pointer is displayed.

   After you have clicked to define the end of the measurement, the measured distance is displayed.

*Note***:** *You can snap the line to angles of 15 degrees using the CTRL key. Position the pointer on one end of the measurement, push CTRL and move the mouse up or down.*

Measuring an angle

1. Select an image in the **Image Overview** pane.
2. From the measurement drop-down list in the **Annotations** tool section, select the following icon.

3. Click once to define the starting point of the first line, move the pointer, and click again to define the end.
4. Move the pointer to the starting point of the second line and click.
5. Move the pointer to the end point and click.

   As you move the pointer, the angles between the two lines are displayed. Both the inner and outer angle is shown.

   After you have clicked to define the end of the second line, the measured angle is displayed.

Measuring a height difference

1. You can measure a height difference (e.g. between two legs) by taking the following steps:
2. Select an image in the **Image Overview** pane.
3. From the measurement drop-down list in the **Annotations** tool section, select the following icon.

4. Click once to define the starting point of the reference line, move the pointer, and click again to define the end point of the reference line.

   The pointer changes to a measuring line.
5. Move the pointer to the first point to be measured and click.
6. Move the pointer to the second point to be measured and click to finalize the measurement.

   After you have finalized the measurement, the measured height difference between the two measuring points is displayed.

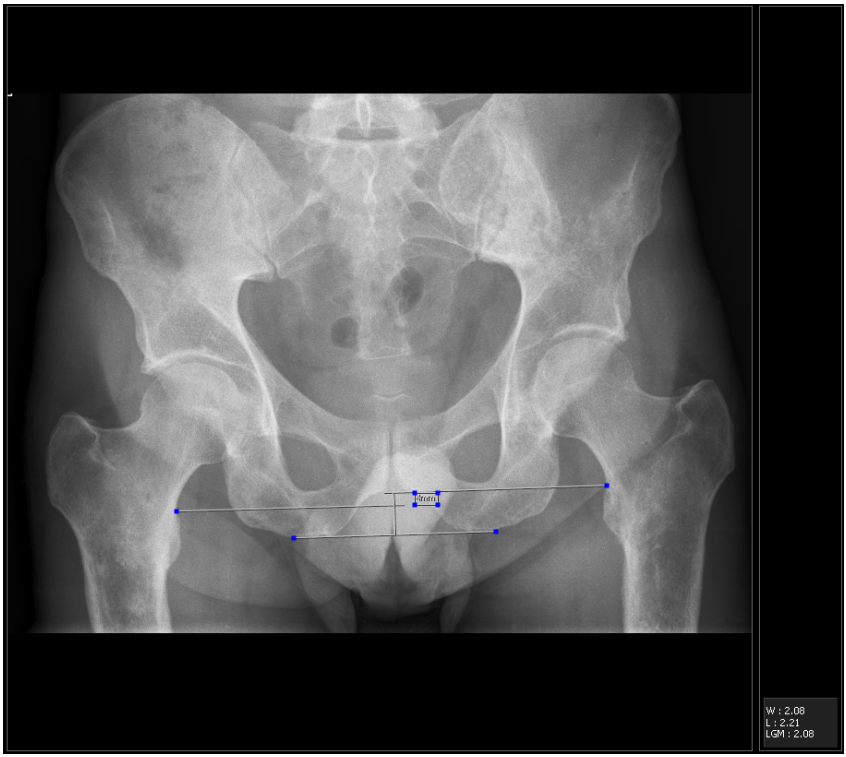


Figure 116: Reference line for height difference

The reference line is now only visible if the measurement is selected. You can always reallocate the reference line of measurement points by selecting the measurement and dragging the specific point.

Note: The height difference measurement is only accurate if proper exposure techniques are used.

Measuring scoliosis (Cobb-method)

1. Select an image in the **Image Overview** pane.
2. From the measurement drop-down list in the **Annotations** tool section, select the following icon.

3. Click once to define the starting point of the first reference line on the first vertebra.
4. Move the pointer to the end point and click.
5. Move your pointer to the starting point of the reference line on the second vertebra of the measurement and click.
6. Move the pointer to the end point and click.
7. Move the pointer to the position where you want to display the measurement and click to finish the measurement.

   The angle difference between the two reference lines is displayed in degrees.

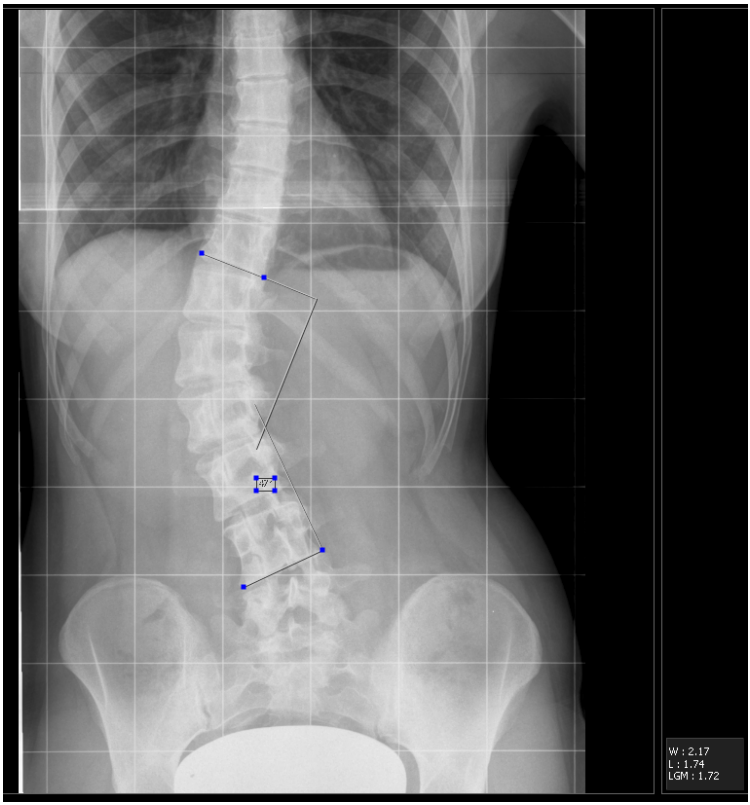


Figure 117: Measurement of scoliosis

You can always reallocate a reference line or measurement points by selecting the measurement and dragging the specific point.

Note: *If a calibration is applied after making length measurements, the values of the old measurements are not updated, but displayed between angle brackets.*

Changing the color of an annotation

Color will only be communicated to the PACS archive when GSPS is configured and supported. On a printer and non-GSPS PACS archives, the different colors will only be visible as grey scale variations.

You can change the color of shapes or text annotations by taking the following steps:

Procedure

1. Click an annotation.
2. From the following drop-down list of the **Annotations** tool section, select the color of your choice.

Figure 118: Color toolbar

The annotation color is changed.

Managing annotations with the right mouse button

When you want to edit an image in the Editing window you can choose to right click on the image. A context menu will be available with the functions shown in the screenshot below:

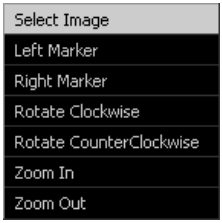


Figure 119: Edit image context menu

After you have added an annotation, you can use the right mouse button to modify (delete) the annotation or to change the annotation color:

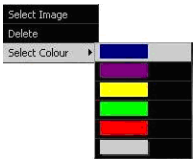


Figure 120: Annotation context menu

Rotating or flipping an image

You can access the rotating and flipping functions in the **Flip-Rotate** section of the left tool bar.

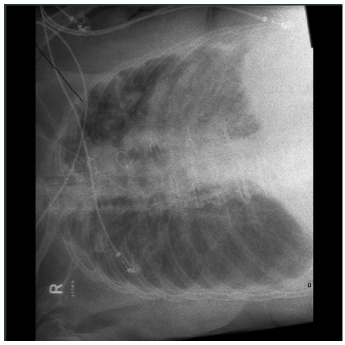
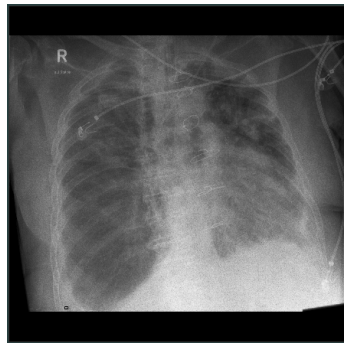
Topics:

Rotating an image clockwise

Figure 121: Rotate button

You can rotate an image 90° clockwise.

The following table displays the effect of the rotation:

	
Original position	Image rotated clockwise

Procedure

1. Select an image in the **Image Overview** pane.
2. Click on the following icon.

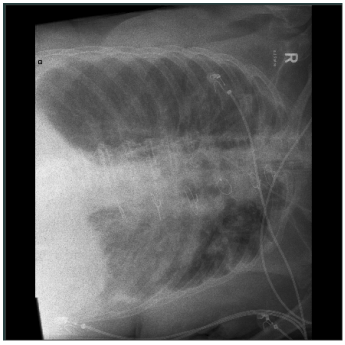
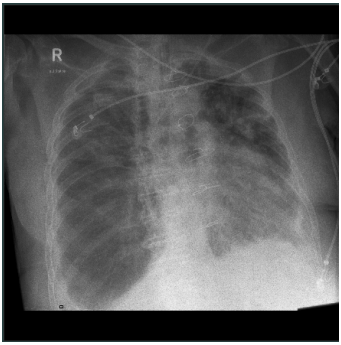
   The image is rotated.

Rotating an image counterclockwise

Figure 122: Rotate Counterclockwise button

You can rotate an image 90° counterclockwise.

The following table displays the effect of the rotation:

	
Original position	Image rotated counterclockwise

Take the following steps:

1. Select an image in the **Image Overview** pane.
2. Click on the following icon.

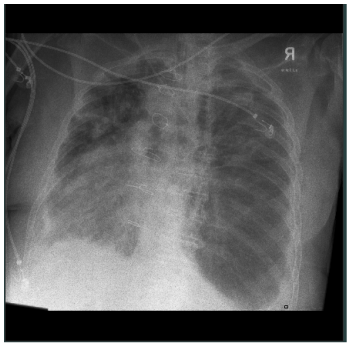
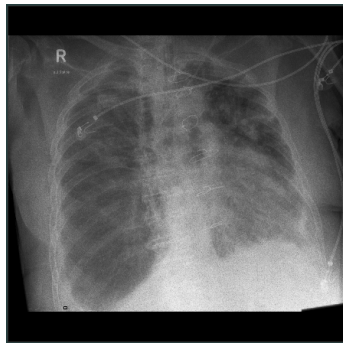
   The image is rotated.

Flipping the image from left to right

Figure 123: Flip button

You can flip an image around the vertical axis.

The following table displays the effect of the flip operation:

	
Original position	Image flipped from left to right

Take the following steps:

1. Select an image in the **Image Overview** pane.
2. Click on the following icon.

The image is flipped.

CAUTION:
When flipping of an image manually is done incorrectly, diagnostic information on the image can be lost.

Note: *Flipping an image changes the view position of an AP image to PA and vice versa.*

Showing/hiding the square marker

The square marker is automatically placed in top left hand corner of all non-mammo images. As it rotates and flips with the image, it gives the radiologist an indication that something has manually been changed, so extra attention is required.

This function toggles between showing and hiding the square marker. This can be necessary to hide the marker if it is positioned on top of diagnostic information.

Procedure

1. Select an image in the **Image Overview** pane.
2. Click the square marker button to toggle between showing and hiding the square marker.

The square marker is shown or hidden.

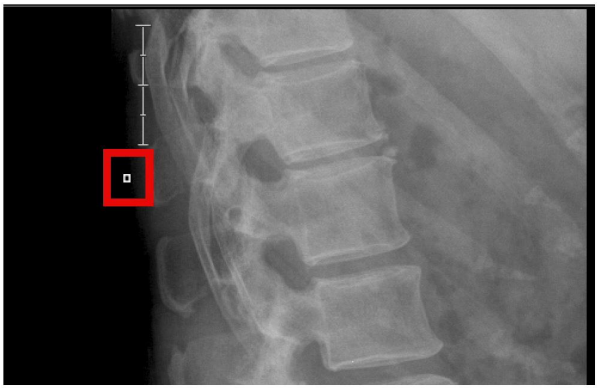


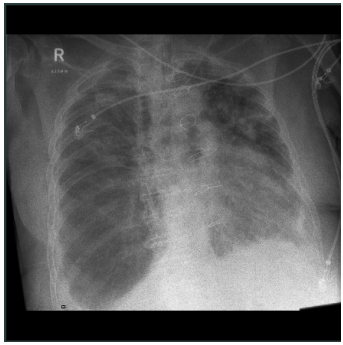
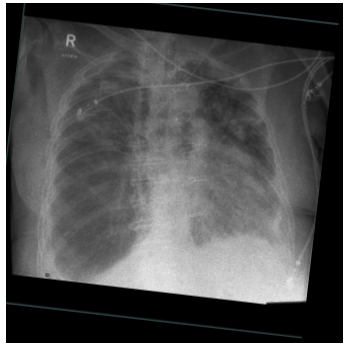
Figure 124: Square marker

Rotating an image by an arbitrary angle

Figure 125: Freehand rotate button

You can rotate an image by an arbitrary angle.

The following table displays the effect of the rotation:

	
Original position	Image rotated by approximately 5° clockwise

Take the following steps:

1. Select an image in the **Image Overview** pane.
2. Click on the following icon.

   The image is dispayed full screen and a circle is displayed on top of the image.
3. Click-Hold the image and drag the mouse arrow to any direction.
   The image is rotated and the reference lines on the circle indicate the angle of rotation.
4. Click **Accept** to apply the rotation to the image.

Zooming in or out on an image

If you have a mouse with a scroll wheel, you can use it to zoom in and out. This can be handy to zoom without having to switch between tools. You can for example continue to apply annotations and zoom at the same time by scrolling the mouse wheel.

You can access the zoom functions in the **Zoom** section of the left tool bar.

Topics:

Zooming in/out on an image

Figure 126: Revert Zoom button

Figure 127: Zoom In button

Figure 128: Zoom Out button

To zoom in or out, take the following steps:

1. Select an image in the **Image Overview** pane.
2. From the drop-down list in the **Zoom** tool section, select the zoom tool of your choice:

Icon	Functionality
	To zoom in.
	To zoom out.

   The image is zoomed.
3. To reset the image to best fit, select the reset zoom button:

Note: You can also zoom in or out on an image by scrolling the mouse wheel.

Displaying images in full screen mode

It is possible to display images in full screen mode.

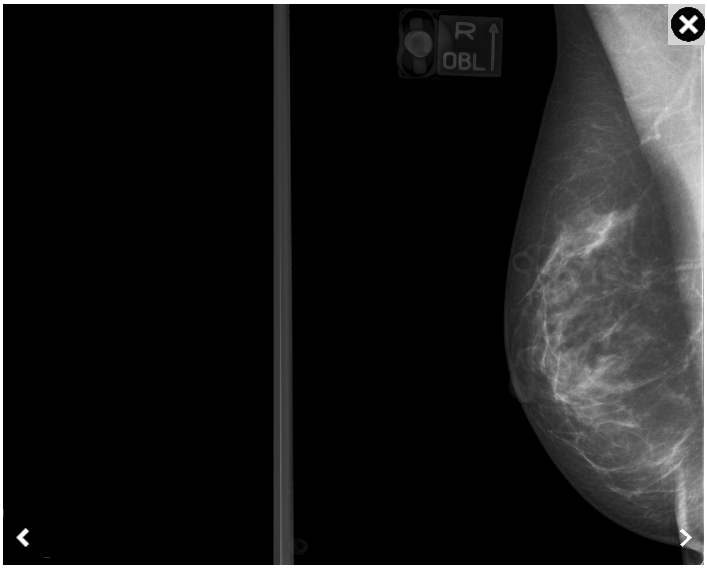
Procedure:

1. Select an image in the Image Overview pane.
2. In the Zoom section, click the **Full Screen** button.

Figure 129: Full Screen button.

Alternatively, press Ctrl + F on your keyboard.

As a result, the image is displayed in full screen mode.



To navigate through the images in the exam, click the left or right arrow button, press the up or down arrow key or on touchscreen swipe left or right.

To close the full screen view, click the **Close** button in the top right corner of the image.

Displaying images in split screen mode

With NX it is possible to display two images in Split screen mode. For mammography examinations, the position of the images shown in split screen mode is linked with the view code.

To display images in split screen mode:

1. Select an examination with images to split and open it.
2. Select the **Split Screen** button.

Figure 130: Split Screen button.

The images are displayed in Split Screen view.

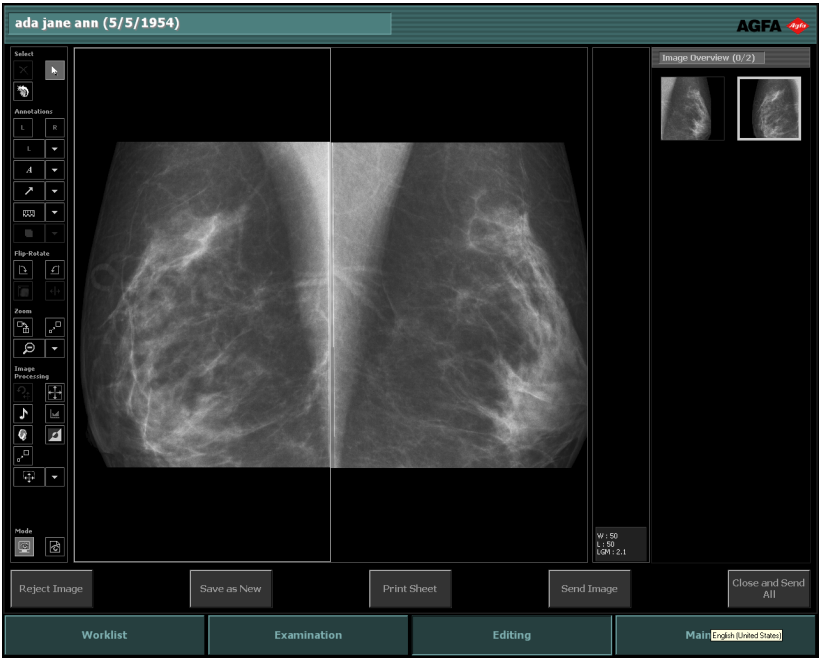


Figure 131: Mammo images in Split Screen view.

Magnifying part of an image

Figure 132: Magnify button

You can selectively magnify a specific rectangular part of an image by taking the following steps:

Procedure:

1. Select an image in the **Image Overview** pane.
2. From the drop-down list in the **Zoom** tool section, select the following icon.

3. Click once to define the starting point of the part that needs to be magnified, move the pointer, and click again the define the end point.

   The part of the image that was selected is magnified.

Roaming over an image

When you have zoomed in on an image or have used the magnification function, you can roam over the image in the following way.

To roam over an image:

1. Select an image in the Image overview pane.
2. Zoom in or perform the magnification action which is required.
3. Click-Hold the image and drag the mouse arrow to any direction.

Roaming vertically over an image

Perform the procedure above, but press the Shift or Ctrl button while you Click-Hold and drag the image.

Note: Roaming within image cells is also possible. Select the image with the mouse and drag it around.

Applying shutters to an image

Figure 133: Apply Shutters button

You can mask non-relevant areas of the image with shutters.

Note: *Applying shutters does not in any way modify the image itself, even if you have saved the results. You can always retrieve the original by using the same procedure as described below.*

Note: *The transparency of the shutters depends on the configuration in the NX Service and Configuration Tool. Refer to the Key user manual for more information.*

Proceed as follows:

1. Select an image in the **Image Overview** pane.
2. From the first drop-down list in the **Zoom** tool section, select the following icon.

   A set of sizing handles is displayed.
3. Drag the sizing handles to mask the non-relevant areas of the image.

   The non-relevant areas are covered with black borders.

Processing images

Editing allows you to perform the following operations to process an image:

- Working with collimation
- Working with the contrast of an image
- Modifying the MUSICA settings of an image

You can access the above functions in the **Image Processing** section of the left tool bar.

Topics:

Working with collimation

NX is equipped with an automatic image collimation feature. With this feature you can define the diagnostic information on an image. All other information is then no longer taken into account: this results in optimal image quality.

To obtain a high accuracy of collimation, you have to take into account a number of rules.

NX automatically detects the collimated areas of the image and uses this information for processing and displaying the image.

Image processing:

- MUSICA image processing excludes the collimated areas from the image processing to achieve optimal image quality and depends on correct detection of the collimation.
- MUSICA2/MUSICA3 image processing does not depend on collimation and achieves optimal image quality even if collimation is not correct.

Image displaying:

- When black borders are enabled, the collimated areas of the image are darkened to improve visibility of the diagnostic information in the image.
- DR images and CR 10-X images are automatically cropped at the collimation borders.

When image processing fails, the image may be displayed incorrectly. Refer to “Window/Level setting is completely out of range” on page 298 to learn how to solve this problem.

Related Links

Collimation rules for DR and CR on page 218
Window/Level setting is completely out of range on page 298

Topics:

Achieving optimal image quality

1. Remove black borders and uncrop.
2. If needed apply manual collimation.

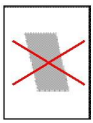
   NX offers the following collimation features:

- Automatic image division detection for CR
- Applying collimation and cropping manually
- Inverting collimation areas
- Black borders and cropping

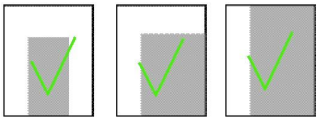
Collimation rules for DR and CR

- The edges of the collimated region should form a rectangle. Circular collimation is not possible.

  In this example automatic collimation is not possible since the collimation region is not a rectangle:

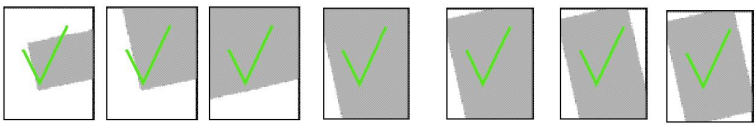


- One or more sides of a rectangle may lie outside the cassette or detector borders.



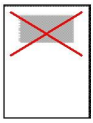
- The rectangle may be rotated with respect to the cassette or detector borders.

- One or more corners of a rotated rectangle may lie outside the cassette or detector borders.



- The rectangle should include the center of the collimated cassette part.

  In the example below automatic collimation is not possible as the collimation area does not include the center of the collimated cassette part:



- The size of each side of the collimation rectangle should be at least 30% of the size of the corresponding cassette part (not applicable when using DR detectors).
- For DR exposures, image processing may fail if the size of the exposed area is extremely small (e.g. fingers, nose). If image process fails, it is recommended to enlarge the exposed area.

Automatic image division detection for CR

Note: *Image division detection is not applicable for DR exposures.*

NX is equipped with an automatic image division feature.

This means that a cassette may subsequently be exposed by parts. While one part of the cassette is exposed, another part is masked with lead plates. This process is known as image division or partitioning.

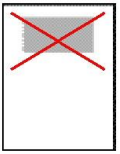
NX supports multiple (2, 3, 4,...) image division and you can permanently set a study on a certain image division configuration, e.g.: “2 division horizontal”.

Setting a certain image division configuration increases error-free division detection and reduces image processing time.

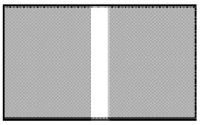
To obtain a high level of accuracy of the automatic image division detection, take the following rules into account (the examples show a 2 division horizontal setup):

- The partitioning sub-images must be approximately equal in size. This also implies that each image occupies no more than one half of the total cassette size.
- The sub-images must be parallel to each other, or one of the images must be parallel to the cassette border.

  In the example below, automatic image detection will not work correctly because the two rectangles are both not parallel with each other and with the image borders.

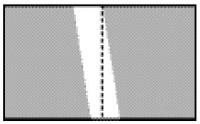


- The subsequently exposed parts may overlap each other or may have no overlap resulting in an overexposed or underexposed strip. So both an overexposed area as an underexposed area are allowed.



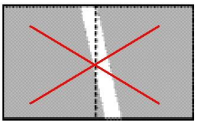
The exposed parts do not overlap, a strip is underexposed

- The overexposed or underexposed strip may be oblique provided that this strip is wide enough to be split.



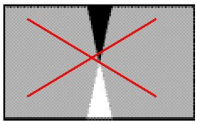
The underexposed strip can be split

In the following example, automatic image detection will be impossible, as the overexposed and underexposed strip are not wide enough to split the overlap strip:



- The overlap strip must have parallel edges. Moreover, the edges must be parallel with the cassette borders.

  In the following example, automatic image detection will be impossible, as there are no parallel borders.



- If you use lead letters, position them within the diagnostic region. This improves collimation.

Black borders and cropping

A collimated image can be displayed either with or without black collimation borders. Black collimation borders facilitate viewing images for diagnosis. DR images and CR 10-X images are automatically cropped at the collimation borders.

To turn the black borders or cropping on or off:

1. Select an image in the **Image Overview** pane.
2. From the first drop-down list in the **Image Processing** tool section, select the following icon.

Related Links

Working with collimation on page 217

Applying collimation and cropping manually

Applying collimation to DR images or CR 10-X images has an extra effect of cropping to the outer border of the collimation area.

In manual collimation mode, you can add collimation shapes to the image. After pressing the Collimation button, these shapes are applied on the image.

Manual collimation is sometimes needed when the automatic collimation algorithm fails, mostly due to not following the rules or bad configuration.

You can manually indicate the collimation borders on an image and command the NX software to reprocess the image accordingly.

You can form two types of collimation areas: rectangular and polygonal. The area inside the collimation form will be used as collimation area. If for example, you wish to use a rectangular area, enclose this area in a rectangle.

Note: Annotations that are not completely enclosed by the manual collimation borders, are removed.

Topics:

- *Drawing a rectangular collimation area*
- *Drawing a polygonal collimation area*
- *Drawing a circular collimation area*

Drawing a rectangular collimation area

1. Select an image in the **Image Overview** pane.
2. From the first drop-down list in the **Image Processing** tool section, select the following icon.

3. Click once to define one corner of the rectangle.
4. Move the pointer.
5. Click again to define the opposite corner.
6. To display the collimation area, select the following icon.

Drawing a polygonal collimation area

1. Select an image in the **Image Overview** pane.
2. From the first drop-down list in the **Image Processing** tool section, select the following icon.

3. Click to define the starting point.
4. Move the pointer and click to define each corner.
5. Click the starting point to close the polygon.
6. To display the collimation area, select the following icon.

Drawing a circular collimation area

1. Select an image in the **Image Overview** pane.
2. From the first drop-down list in the **Image Processing** tool section, select the following icon.

3. Click twice on the circumference of the circle you want to draw. The circle appears on the image, with an indication of its diameter and its area.
4. To define the position of the circle, move the pointer and click.
5. To display the collimation area, select the following icon.

Inverting collimation areas

Inverting collimation areas is a part of manual collimation. It is used to hide the white area created by lead radiation shielding.

You can invert a collimation area by taking the following steps:

1. Select an image in the **Image Overview** pane.
2. Draw a collimation area.
3. From the first drop-down list in the **Image Processing** tool section, select the following icon.

The collimation area is rasterized.

4. To display the inverted collimation area, select the following icon.

The part of the image within the collimation area is blackened out.

Related Links

Working with collimation on page 217

Working with the contrast of an image

In NX, you can manually adjust the global contrast and the intensity of an image. NX offers you the following contrast features:

- Changing the global contrast and intensity of an image (window/level)
- Undoing contrast and intensity changes
- Copying and pasting window/level values
- Viewing the histogram of an image

Topics:

Changing the global contrast and intensity of an image (window/level)

Note: *When you wish to adjust the global contrast and intensity, it is advised to turn on image saturation (burn), especially if you will print the image.*

It is possible to configure 'burn' to automatically be switched on for all images. This allows you to easily check if diagnostic areas of the image are saturated due to less than perfect W/L.

Note: *Enabling burn automatically for all images is done in the configuration in the NX Service and Configuration Tool. Refer to the Key user manual for more information.*

Related Links

Applying burn to an image on page 233

Topics:

Adjusting the global contrast and intensity using the mouse

1. Select an image in the **Image Overview** pane.
2. Select the following icon.

3. Use the mouse to adjust the global contrast and intensity:

	To	Do this
Contrast	Increase the global contrast	Move pointer to the left
	Decrease the global contrast	Move pointer to the right
Intensity	Increase the global intensity	Move the pointer up (or move the mouse away from you).
	Decrease the global intensity	Move the pointer down

The contrast and intensity are adjusted as you move the pointer.

Note: By pressing CTRL or SHIFT the mouse can be locked in 1 direction (vertical or horizontal).

4. When the desired contrast and intensity have been reached, click in the image pane.

Adjusting the global contrast and intensity using a touch screen

1. Select an image in the **Image Overview** pane.
2. Select the global contrast and intensity icon.

3. Use the pointer to adjust the global contrast and intensity, as indicated in the table above.
4. When the desired contrast and intensity have been reached, click the global contrast and intensity icon again.

Undoing contrast and intensity changes

You can undo contrast and intensity changes by selecting the second icon from the **Image Processing** tool section.

The image will return to its original state.

Copying and pasting window/level values

If you work with QC images on NX, you have the possibility to copy the window/level values of one QC image and apply these values to an other QC image by pasting.

Procedure:

1. Open a QC image. Make sure you are in the Editing environment.
2. Right-click on the image.

   The context menu appears:

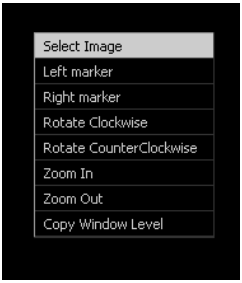


Figure 134: Editing Context menu for QC images.

3. Select **Copy Window Level**.
4. Switch to an other QC image (by selecting the image thumbnail). This may be an image from another QC examination.
5. Right-click on this image.

   The context menu appears:

Figure 135: Editing Context menu for QC images.

6. Click **Paste Window Level**.

   The window level values of the first image are applied to the second image.

Viewing the histogram of an image

A histogram is a graph of the gray scale distribution in an image. The horizontal axis indicates the gray scales, from light on the left to dark on the right. The vertical axis indicates the number of pixels per gray value.

In NX, images are displayed as if they were printed on a specific film type. The corresponding sensitometric curve can be displayed in the **Histogram** window. This window also gives numeric values for the global contrast and intensity of the image.

Note: *Depending whether the image is processed using MUSICA parameters or MUSICA2/MUSICA3 parameters, the histogram may somewhat deviate in appearance.*

To display the histogram and the sensitometric curve:

1. Select an image in the **Image Overview** pane.
2. Select the following icon.

The **Histogram** window is displayed.

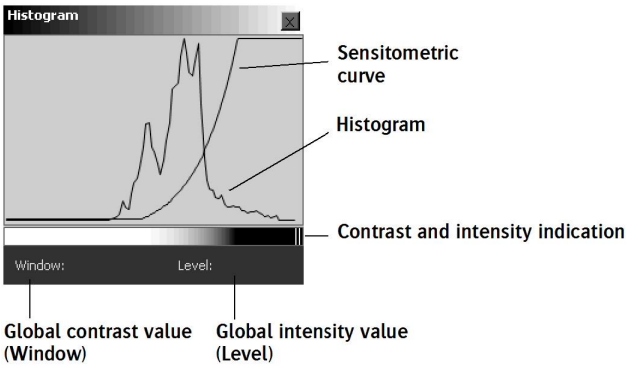


Figure 136: MUSICA histogram.

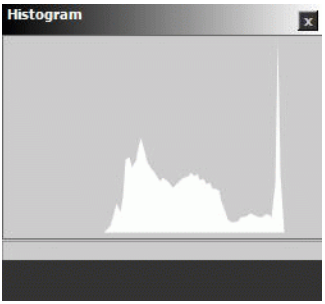


Figure 137: MUSICA2/MUSICA3 histogram.

The global contrast value (Window) of the image is given in the lower left corner of the window; the global intensity value (Level) in the lower right corner.

Note: To change the sensitometric curve, see "Modifying the MUSICA settings of an image".

Related Links

Modifying the MUSICA settings of an image on page 229

Changing the global contrast and intensity of an image (window/level) on page 224

Modifying the MUSICA settings of an image

Via advanced MUSICA processing (MUSICA: Multi-Scale Image Contrast Amplification), you can fine-tune the contrast and intensity of an image.

Related Links

About MUSICA on page 229

Topics:

About MUSICA

NX is equipped with an automatic image processing feature. A number of advanced proprietary image processing algorithms enable optimal rendering of all captured X-ray information on high-quality film. This technology is called MUSICA, which stands for MUlti Scale Image Contrast Amplification.

These algorithms are automatically applied. This reduces postprocessing to an absolute minimum.

MUSICA image processing parameters

Name	This function enables the system to
MUSI-contrast	Enhance subtle contrast details on all scales in order to improve their visibility, regardless of the size of the detail.
Edge contrast	Enhance small scale details, including edges. As noise has a similar appearance, it will be enhanced as well and you might have to look for a balance.
Latitude reduction	Attenuate the larger scale intensity variations across the image in order to emphasize the medium and small scale details. This way, good visibility of features is obtained in

Name	This function enables the system to
	those studies which typically exhibit an important brightness shift across the image, without causing saturation into white or black in large portions of the image.
Noise reduction	Attenuate fine grain detail contrast, thus reducing noise impression in those image regions where noise is more prominent, without significantly affecting the contrast of image features like spots, edges and textures.
Extend window right	Extend the Window to the right in order to use more lighter gray levels. Hence, images become lighter and have less contrast by default.
Extend window left	Extend the Window to the left in order to use more darker gray levels. Hence, images become darker by default, but have less contrast.
Window/Level calculation	Calculate the optimal contrast (Window) and intensity (Level) of an image and change these values interactively.
Sensitometry	Simulate an exposure on a given film by selecting a different sensitometric curve.

Note: *NX supports two variants of MUSICA image processing : MUSICA and MUSICA2/MUSICA3, each controlled by a specific set of processing parameters.*

Interactively adjusting the MUSICA image processing parameters

To interactively adjust the image processing parameters:

1. Select an image in the **Image Overview** pane.
2. From the third drop-down list in the **Image Processing** tool section, select the following icon.

The **Modify MUSICA settings** window is displayed.

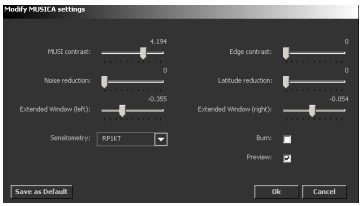


Figure 138: Modify MUSICA settings window

3. Apply the MUSICA parameters according to your preferences:

To		Use
Fine-tune the contrast of all features		MUSI contrast slider
Fine-tune the contrast of short-range features, including edges.		Edge contrast slider
Reduce noise without affecting the contrast of short-range features such as edges and texture		Noise reduction slider
Fine-tune the contrast of long-range features		Latitude reduction slider
Fine-tune the intensity	Make the image darker	Extended Window (left) slider
	Make the image lighter	Extended Window (right) slider

Note: *Enhancing edge contrast will also enhance noise and may cause artefacts in the image.*

Note: *Edge contrast and latitude reduction influence the dynamic range of the image. Reducing the dynamic range is useful prior to printing the image on a specific film.*

4. To simulate exposure of the image on a specific film, click a film sensitometric curve in the **Sensitometry** list.
5. To turn on image saturation, select the **Burn** check box.
6. Click **OK** to apply the MUSICA processing parameters and close the window, click **Cancel** to quit without applying the parameters or click **Set Default** to save the current image processing settings as default for the exam in the exam tree.

Note: If you select the Preview button, the effect of the MUSICA processing is shown in real time in the Editing window.

Related Links

Applying burn to an image on page 233

Interactively adjusting the MUSICA2/MUSICA3 image processing parameters

Procedure:

1. Select an image in the **Image Overview** pane.
2. In the **Image Processing** tool section, select the following icon.

The **Modify MUSICA settings** window is displayed.

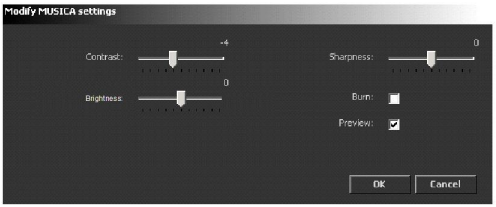


Figure 139: Modify MUSICA2/MUSICA3 settings window

3. Apply the MUSICA parameters according to your preferences:

To	Use
Fine-tune the contrast of all features	MUSI contrast slider
Adjust the brightness interactively	Brightness slider
Change the sharpness of the image interactively	Sharpness slider
Enable burn	Enable Burn checkbox

Note: Defining the standard MUSICA2/MUSICA3 parameters is done in the NX Service and Configuration Tool. Refer to the Key user manual for more information.

Related Links

Applying burn to an image on page 233

Applying burn to an image

If you wish to adjust the global contrast of an image, it is useful to turn on image saturation (burn). Due to excessive adjustment of the contrast or the intensity or due to detector saturation by overexposure, some parts of the image can become saturated, i.e. 100% white or 100% black.

If burn is turned on, the saturated parts of the image will be inverted, i.e. white is displayed as black and vice versa. This allows you to easily see whether parts of the image are saturated due to contrast and intensity adjustment.

Note: Because saturation shows up more distinctly on film, the burn function is especially useful if you are adjusting the global contrast of an image which you will print.

To turn on the burn function:

1. Select an image in the **Image Overview** pane.
2. Select the following icon.

Saturated parts of the image are inverted.

Inverting an image

You can display the active image inverted, i.e. white displayed as black, light gray values displayed as the corresponding dark gray values, and vice versa. Inverting an image often makes it easier to look at soft tissue areas, e.g. to find foreign objects in soft tissue.

To invert an image:

1. Select an image in the **Image Overview** pane.
2. Select the following icon.

The inverted image is displayed.

Enabling/disabling background darkening

NX has a license which performs background darkening during the processing of mammo images. If this license is active, images are processed in such way that they appear in NX with a darkened background. Inverting the image affects background darkening.

In the Editing environment, a button is available to disable the background darkening.

Note: *When changing the window/level on mammo images with background darkening applied, any saturated pixels in the breast area will also have background darkening applied to them. This is especially visible on inverted images.*

Procedure to disable background darkening:

1. Select a mammography image which has been processed with background darkening.
2. Click the Background darkening toggle button.

As a result, background darkening is turned off.

To turn background darkening on, click the button again.

Printing images

You can access the print functions by pressing the button in the lower left corner of the window. Print mode will be opened and the printing tools will appear on the right of the print area.

Normally, new images reaching NX are automatically sent to the default printer and the default DICOM station. However, if e.g. the configured default printer is out of service, you can set another printer to temporarily be the default printer (“rerouting”).

Note: *Printing all images of an examination or printing images from multiple examinations on one sheet is also possible.*

Related Links

Printing images on page 151
Print Mode (P) on page 166

Topics:

Changing the layout you want to print on

To optimally prepare it for printing, you can configure the layout of an image on the print sheet.

Topics:

Printing an image on true size

To print an image on the actual size without taking into account the print sheet borders, take the following steps:

1. Select an image in the **Image Overview** pane.
2. In the printing tool section, click on the following icon.

The image is resized to the actual size.

CAUTION:
An incorrect line or circular calibration can lead to incorrect printing of an image.

Fitting an image to the image cell

To resize an image to fit it within the borders of the print sheet, take the following steps:

1. Select an image in the **Image Overview** pane.
2. In the printing tool section, click on the following icon.

The image is resized to the print sheet borders.

Defining the print sheet orientation (portrait/landscape)

To define the orientation in which the image will be printed, use the following buttons:

- To apply a landscape orientation, click:

- To apply a portrait orientation, click:

Managing print sheets

Related Links

Print Mode (P) on page 166

Topics:

Adding a print sheet

You can add an empty print sheet to an exam, and place images on the sheet. Take the following steps:

1. Open the exam in **Print** mode.
2. In the printing tool section, select a sheet layout from the first drop-down list.

   The sheet is added to the exam.
3. Drag the images that you want to display on the print sheet from the **Image Overview** pane in the print area.

Removing a print sheet

You can remove a print sheet from an exam by taking the following steps:

1. Open the exam in **Print** mode.
2. In the printing tool section, click on the following icon.

   The sheet is removed from the exam. The images on the sheet will not be printed.

Defining the position of the text box

To define the position of the text box that will be printed on a sheet, take the following steps:

1. Open the exam in **Print** mode.
2. In the printing tool section, select a text box position from the drop-down list.

   There are four possibilities:

Text box	Layout type
	Aligns the text box to the left.
	Aligns the text box to the right.
	Aligns the text box to the center.
	Hides the text box so that it will not be printed.

The chosen layout is displayed accordingly (or hidden) on the print sheet.

Note: *Defining the layout and the content of print sheets is done in the configuration in the NX Service and Configuration Tool. Refer to the Key user manual for more information.*

Adding an image to an existing layout

You can split an image layout on the print sheet in two to add another image.

This is not active for 1-on-1 layout. In this case, you simply need to select the new layout you need.

Proceed as follows:

1. Open the exam in **Print** mode.
2. Select the image cell you want to split.
3. In the printing tool section, click on the following icon.

The image layout is split in two parts, where the upper (left) part contains the original image and the lower (right) part can be used for adding another image.

Inserting a patient photo

You can add an image (for example a patient photo) to the sheet text box. To be able to perform this task, you must have an appropriate photo available. Also, the layout of the print sheet text box must be configured in such way that it can contain a bitmap image.

You can also only insert a photo when you are in Print mode.

Procedure:

1. Right-click on the print sheet and select Add Patient Photo from the context menu.

   A standard Windows Open dialog box is displayed.
2. Go to the location of the file, select it and click OK.
3. To remove the photo, right click on the print sheet and select Remove Patient Photo from the context menu. This action will remove the image from the print sheet and leave the image cell empty.

   After removing a photo, you will be able again to add a new photo.

Note: The ability of NX to insert a photo depends on the configuration. Refer to the Sheet Text Box configuration section in the Key user manual.

Using the Main Menu

Topics:

About the Main Menu

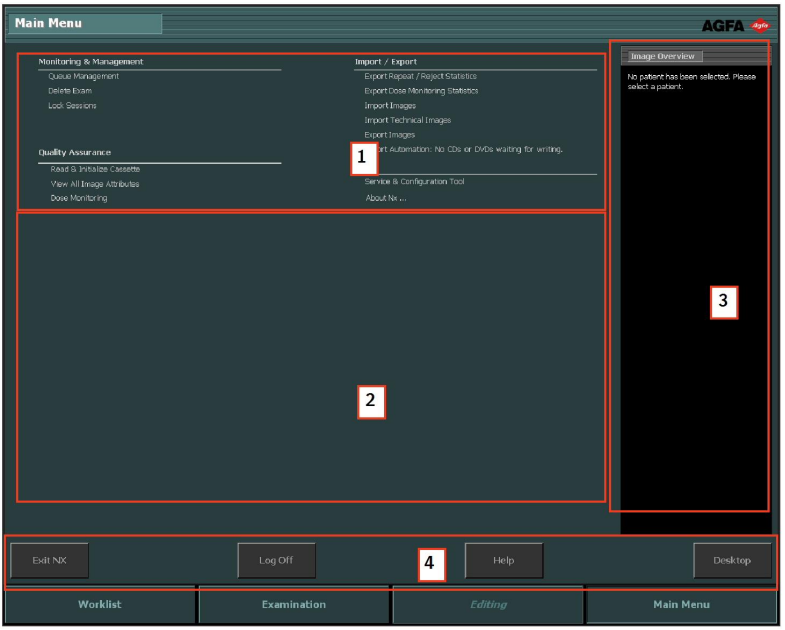


Figure 140: Main Menu window with Functionality Overview pane (1), Workspace (2), Image Overview pane (3) and Action buttons (4).

In the **Main Menu** window, you can manage certain aspects of the NX Workflow which do not belong to the daily workflow.

The **Main Menu** window has three main areas:

- In the top segment of the Main Menu window is the Functionality Overview pane.
- In the middle of the screen is a workspace where, depending on a selection in the Functionality Overview pane, different actions can be done.
- On the right is the Image Overview pane. This is a thumbnail overview of the images included in the examination on which you want to perform certain actions.

At the bottom of the window, there are several Action buttons.

Note: *The appearance of the Main Menu depends on the role of the person who has logged in. When you are logged in as "user" some of the items in the Main Menu will not be visible.*

Related Links

Stopping NX without stopping Windows on page 57

Stopping NX by logging out of Windows on page 56
Switching to Windows without stopping NX on page 58
System Documentation on page 21
Opening an application, folder or file on page 126

Working in the Main Menu

Note: *The appearance of the Main Menu depends on the role of the person who has logged in. When you are logged in as "user" some of the items in the Main Menu will not be visible.*

In the Functionality Overview pane of the Main Menu you have links to different configuration actions for NX:

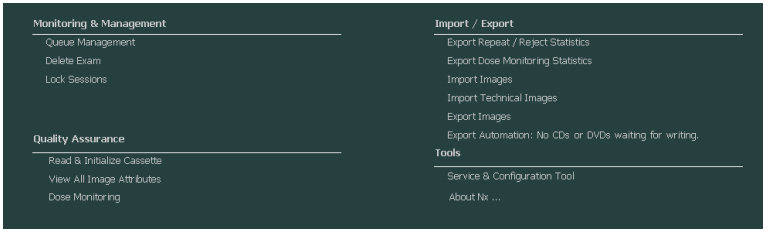


Figure 141: The Functionality Overview pane.

Monitoring and Management

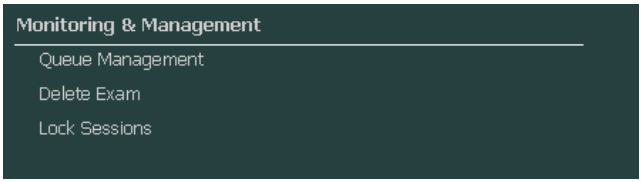


Figure 142: Monitoring and Management section of the Functionality Overview pane.

Topics:

Queue Management

To monitor the work queues using the Queue management tool:

1. Click **Queue management** in the Functionality Overview pane of the Main Menu window.

   The Queue Management pane is opened in the middle section of the Main Menu window:

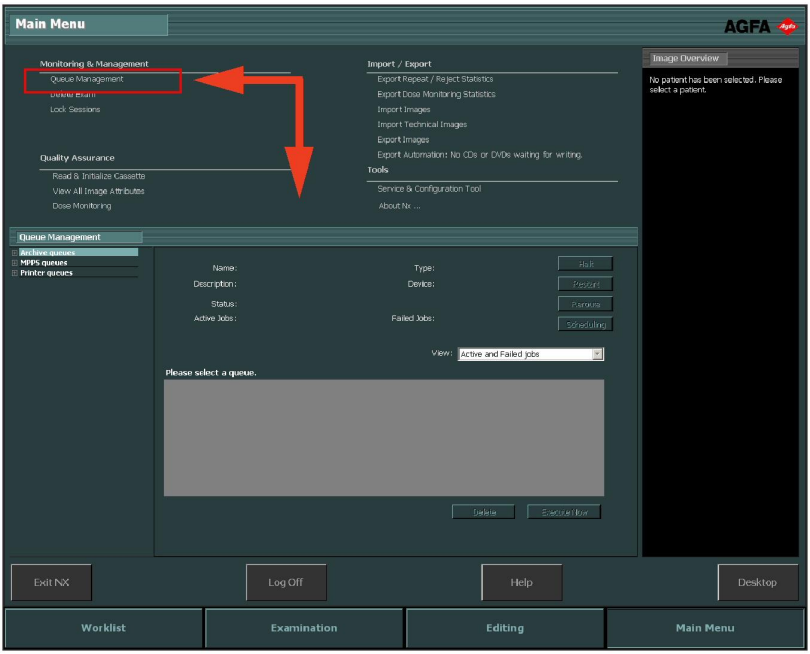


Figure 143: Main Menu window with Queue Management pane open.

2. If you are working on the Central Monitoring System, first select the NX Workstation of which you want to observe a queue. It is not possible to view the queues of all NX rooms at the same time.

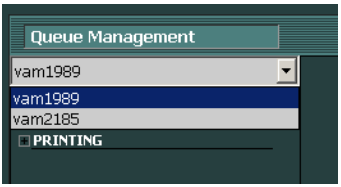


Figure 144: Selecting in-room NX Workstations for Queue management viewing.

3. In the tree view, select a destination type (archiving, printing or MPPS Reporting).

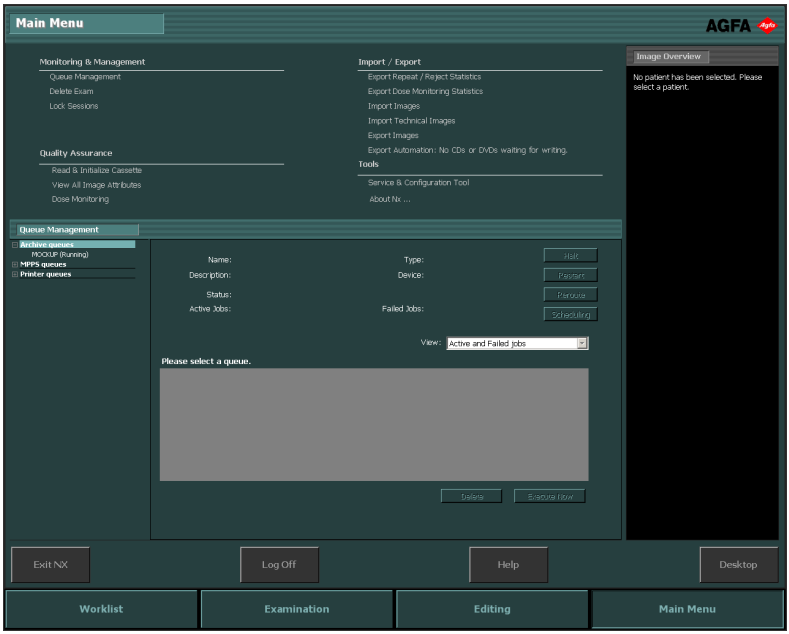


Figure 145: Selecting destination type.

4. Select the name of a destination.

   The red box shows the selected area:

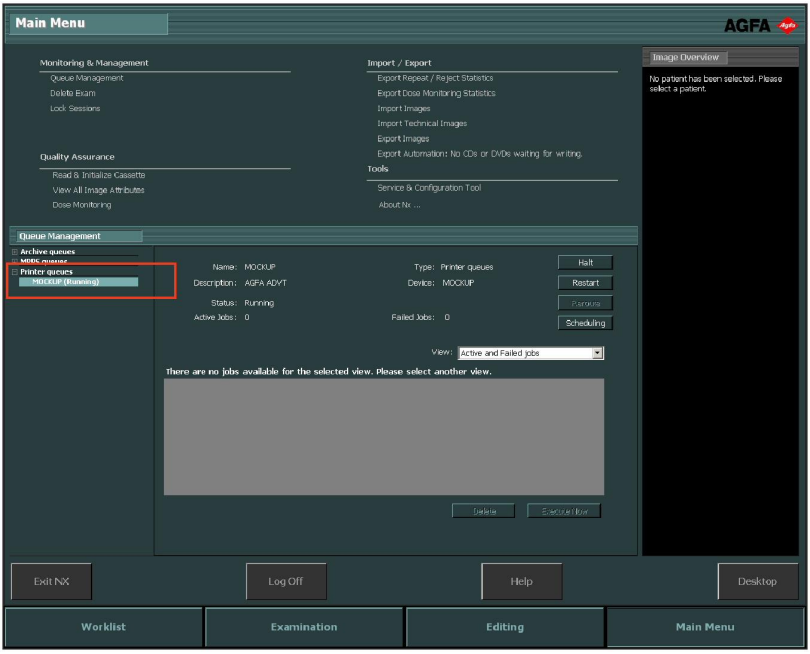


Figure 146: Main Menu window with Queue Management pane opened and Destination Name selected.

In the main window, the destination parameters appear, together with the list of jobs for that particular destination. The main window also has a number of buttons for controlling the queue on the right side of the screen.

Button	Action
 **Figure 147: Halt Button.**	Use this button to stop the queue temporarily.
 **Figure 148: Restart Button.**	Use this button to restart the destination.
 **Figure 149: Reroute Button.**	Use this button to change destinations.

Button	Action
 **Figure 150: Scheduling Button.**	Use this button to define and schedule routing destinations.

Topics:

- *Reroute to another destination*
- *Schedule the selected queue*
- *Sorting*
- *Musica MCE Engine archive*

Reroute to another destination

Procedure:

1. Select an archive or a print device.
2. Click the **Reroute** button.

   The Reroute Queue dialog box appears.

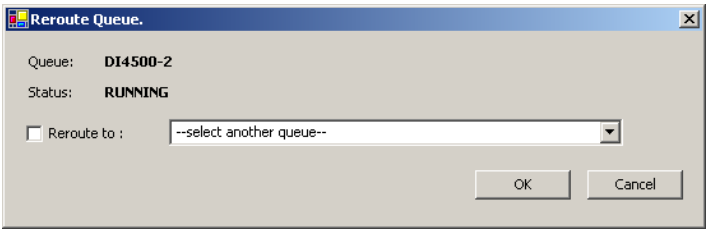


Figure 151: Reroute Queue window.

3. Check the reroute check box and select a destination.
4. Click **OK**.

Note: When the user works with MPPS reporting, the Reroute button is disabled.

Schedule the selected queue

Procedure:

1. Click the **Scheduling** button.

   The Scheduling Overview dialog box appears.

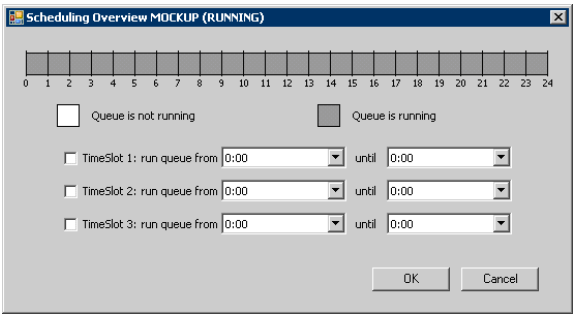


Figure 152: Schedule Queue window.

2. Define which and how many time slots must be used for the selected destination.
3. Click **OK**.

Note: *When the user works with MPPS reporting, the Scheduling button is disabled.*

Sorting

In the main window, queues can also be sorted using a number of filters.

Procedure:

From the **View** drop down list, select the jobs you wish to see:

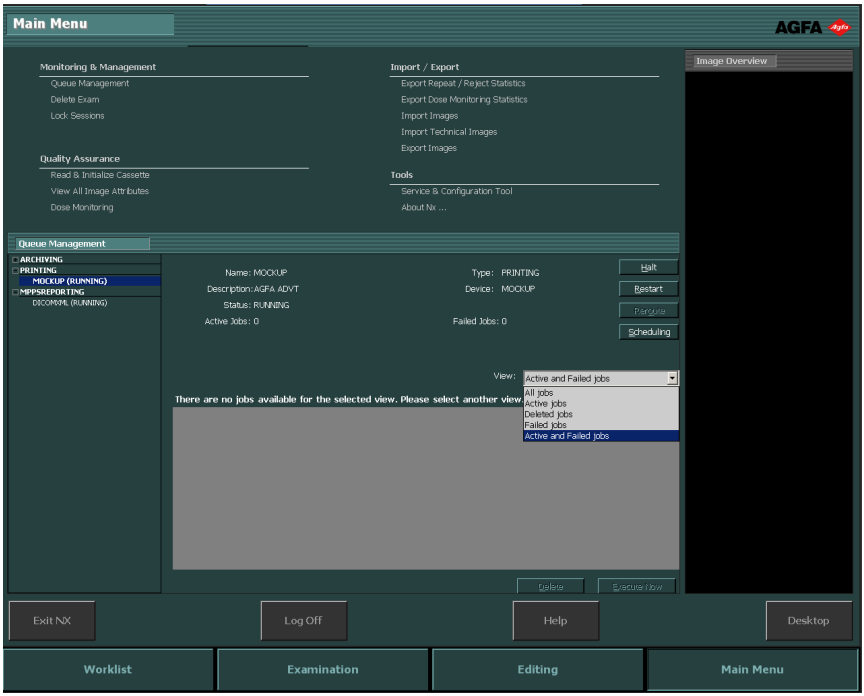


Figure 153: Main Menu window with Queue Management pane and View drop down menu selected.

Musica MCE Engine archive

If NX is configured to perform Micro Calcification Enhancement (MCE) on mammography images, a special archive queue is listed, that is not intended to store images. The Musica MCE Engine archive queue manages the MCE image processing jobs. The processed images are stored on a PACS archive, managed by a normal archive queue.

Delete Examination

The Key user can select closed examinations and remove them.

Note: *The complete examination with all images will be deleted.*

Note: *If you want to delete images on the Central Monitoring System, first perform a query in the Worklist Overview window. Only the search results will be displayed in the Delete Images pane.*

To delete examinations from the history list exams:

1. Click **Delete Examination** in the Functionality Overview pane of the Main Menu window.

   The Delete Examination pane is opened in the middle section of the Main Menu window:

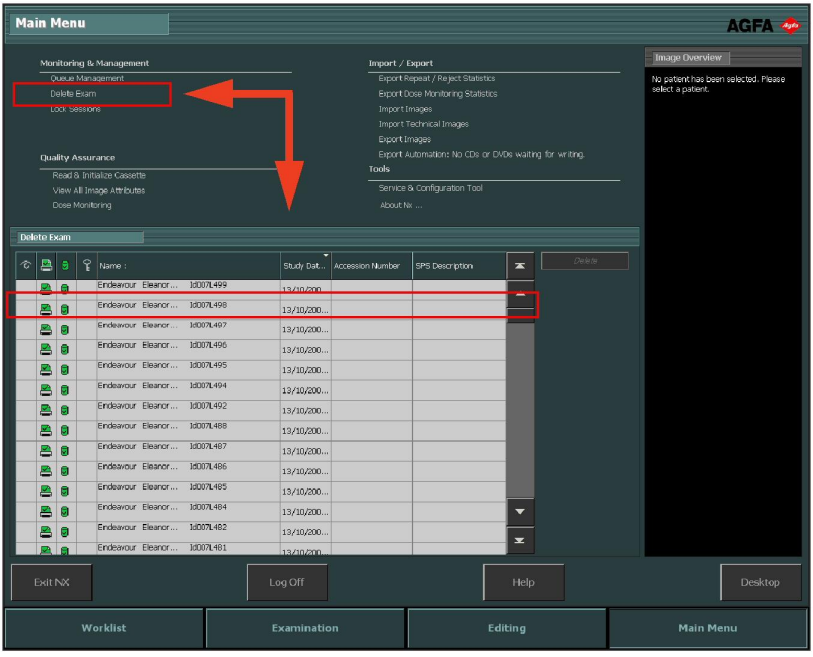


Figure 154: Main Menu window with Delete Images pane.

2. Select the examination you want to remove from the list.

The images of the selected examination are displayed in the Image overview pane.

3. Click **Delete**.

   The selected examination is deleted.

Lock Examinations

To prevent exams from being deleted from the workstation, the user is able to lock them. A locked examination can be unlocked using a toggle mechanism.

Note: If you want to lock exams on the Central Monitoring System, first perform a query in the Worklist Overview window. Only the search results will be displayed in the Lock Examinations pane.

To lock exams, proceed as follows:

1. Click **Lock Examinations** in the Functionality Overview pane of the Main Menu window.

   The Lock Examinations pane is opened in the middle section of the Main Menu window:

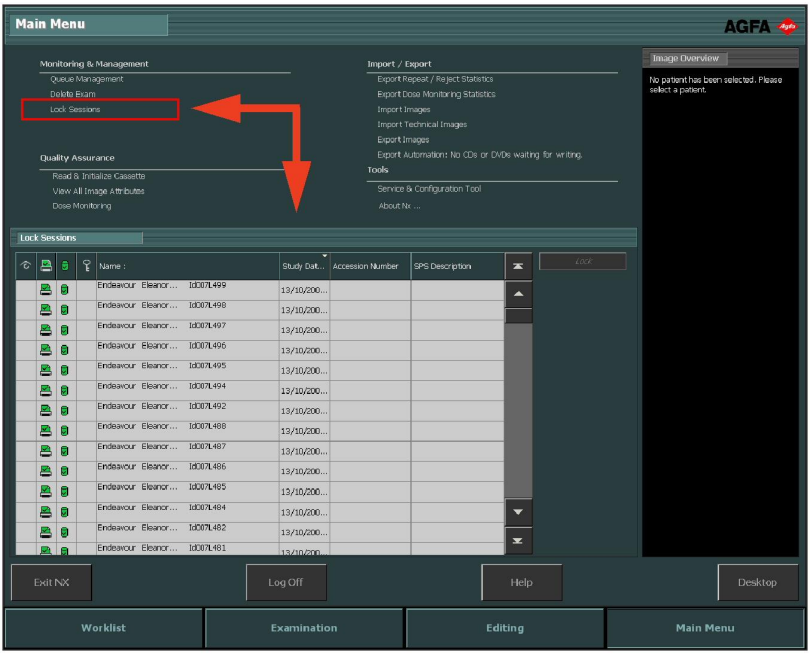


Figure 155: Main Menu window with Lock Examinations pane.

2. Select an examination from the list and click **Lock**. A lock icon will appear next to the examination:

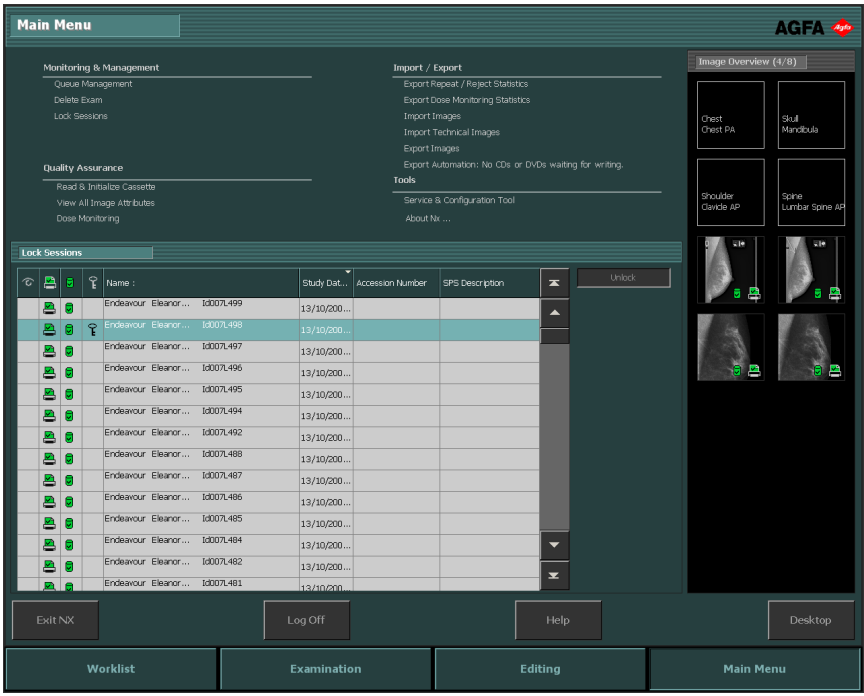


Figure 156: Main Menu window with Lock Examinations pane and Examination selected.

To unlock an examination, select a locked examination and click **Unlock**.

Quality Assurance

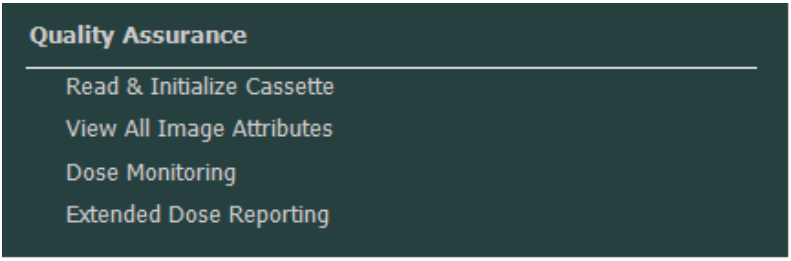


Figure 157: Quality Assurance section of the Functionality Overview pane.

Topics:

- *Read and Initialize Cassette*
- *View all Image Attributes*
- *Modifying Dose Monitoring Statistics*
- *Extended Dose Reporting*

Read and Initialize Cassette

Using the NX Main Menu you can read cassette information as well as initialize cassettes to be used together with DICOM Digitizers.

The workflow is different for two types of configuration:

- Configuration with ID Tablet
- Configuration with Fast ID

Note: *Cassettes for the DX-S Digitizer cannot be initialized using NX.*

Topics:

Initializing a cassette (write initial information on a cassette) in a configuration with ID Tablet

1. Click **Read and Initialize Cassette** in the Functionality Overview pane of the Main Menu window.

   The Read and Initialize Cassette pane is opened in the middle section of the Main Menu window:

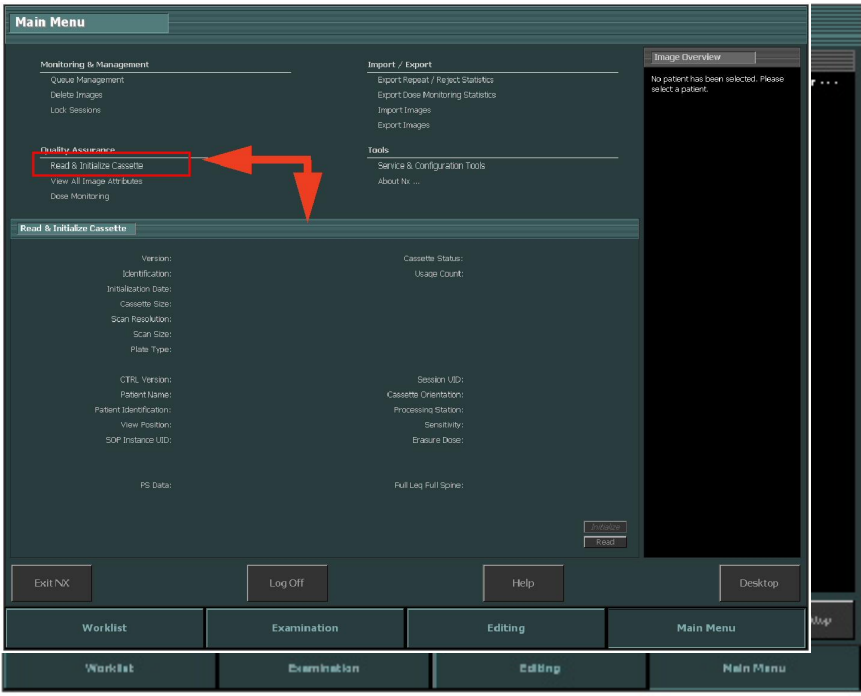


Figure 158: Main Menu window with Read and Initialize Cassette pane.

2. Insert a cassette in the ID Tablet.
3. Click **Read**.

   The Read and Initialize Cassette pane is filled with the details of the inserted cassette.

   Two attributes of the cassette can be changed here.

   - Plate type (1). This is the type of plate used in the cassette.
   - Usage count (2). This is the number of times the cassette has been scanned. You can reset this counter.

   The other attributes are read only.

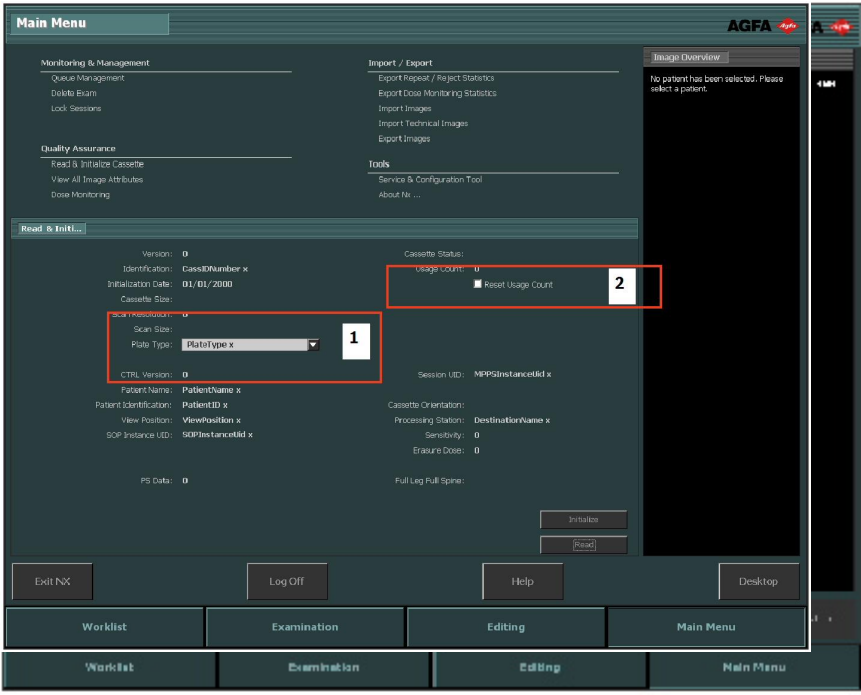


Figure 159: Editable fields in Read and Initialize Cassette pane.

If the information is OK, you can proceed with initializing the cassette.

4. Click **Initialize**.

   The information is now written to the cassette.

   Once initialization has been completed, all fields are cleared so that the same procedure may be performed for subsequent cassettes.

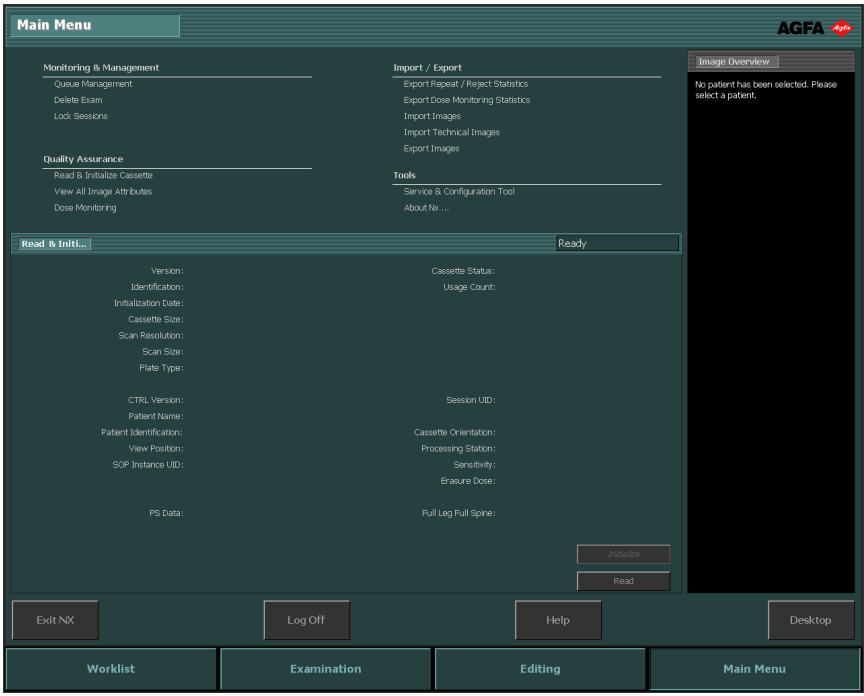


Figure 160: Initialization of the cassette completed.

Initializing a cassette (write initial information on a cassette) in a configuration with Fast ID

1. Click **Read and Initialize Cassette** in the Functionality Overview pane of the Main Menu window.

   The Read and Initialize Cassette pane is opened in the middle section of the Main Menu window:

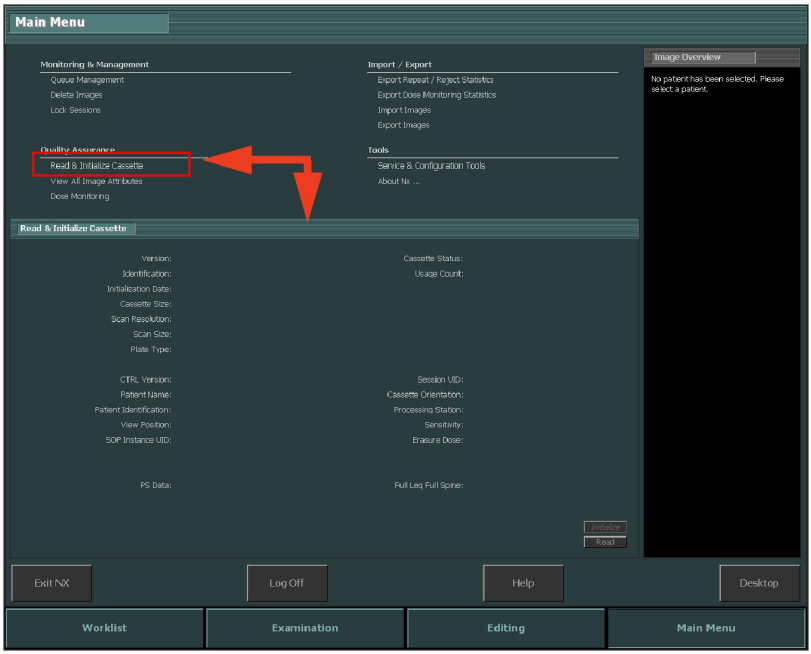


Figure 161: Main Menu window with Read and Initialize Cassette pane.

2. Click **Read**.

   A signal is now sent to the Digitizer, indicating that the next cassette is entered in order to read and change cassette attributes, not for digitizing images.

3. Insert the cassette in the Digitizer.

   The Read and Initialize Cassette pane is filled with the details of the inserted cassette.

   Two attributes of the cassette can be changed here.

   - Plate type (1). This is the type of plate used in the cassette.
   - Usage count (2). This is the number of times the cassette has been scanned. You can reset this counter.

   The other attributes are read only.

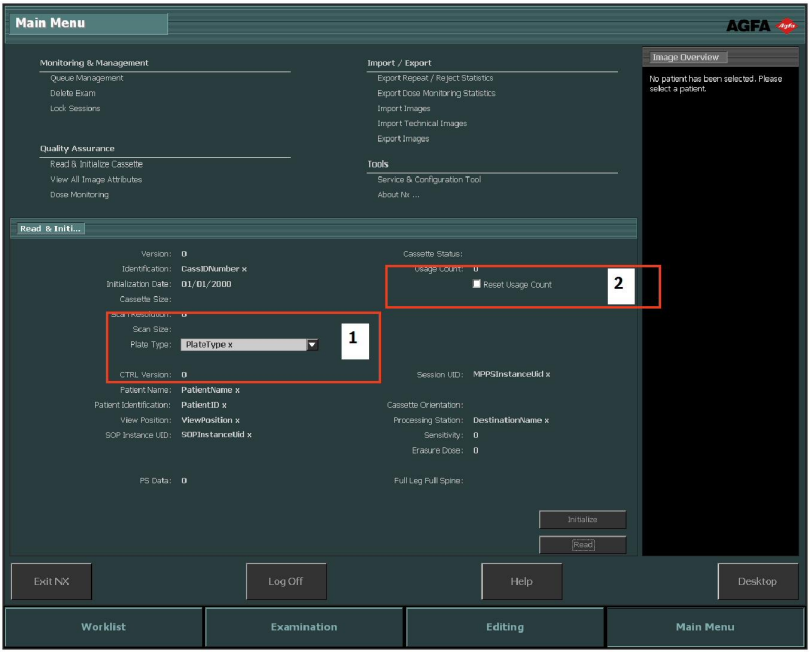


Figure 162: Editable fields in Read and Initialize Cassette pane.

If the information is OK, you can proceed with initializing the cassette.

4. Click **Initialize**.

   The information is now written to the cassette.

   Once initialization has been completed, all fields are cleared so that the same procedure may be performed for subsequent cassettes.

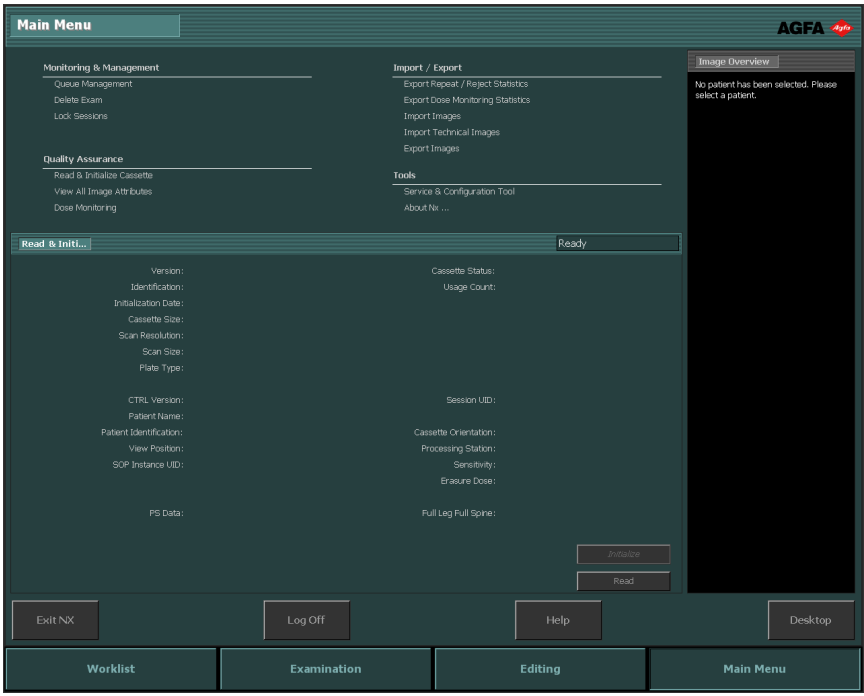


Figure 163: Initialization of the cassette completed.

View all Image Attributes

The Key user can choose to view all image attributes of a selected image. These are then displayed (read only) in the task pane.

Procedure:

1. Click **View all image attributes** in the Functionality Overview pane of the Main Menu window.

   The View All pane is opened in the middle section of the Main Menu window:

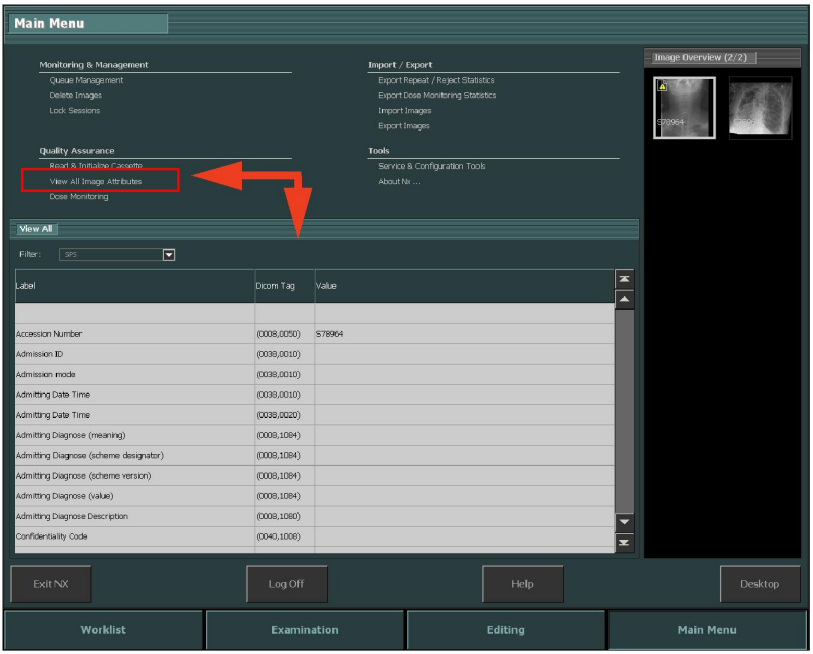


Figure 164: Main Menu window with View All pane.

2. You can filter the image attributes in the Filter drop down menu.

Name	Action
 Filter drop down menu.	Select a filter option from the drop down menu (SPS, Exposure or Patient).

3. Columns may be sorted in ascending order by clicking a column header once. Clicking twice will sort the data in descending order. A third click will restore the original order.

Modifying Dose Monitoring Statistics

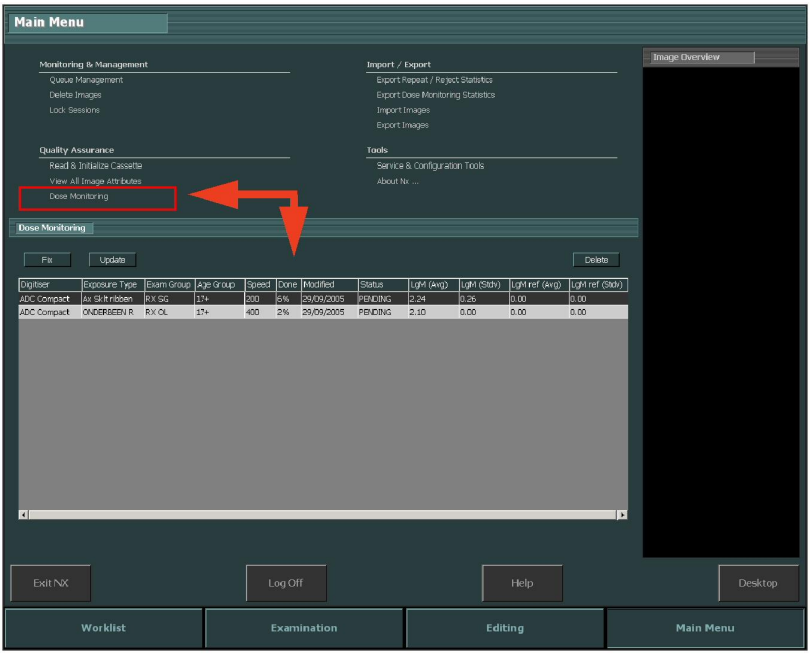


Figure 165: Main Menu window with Dose Monitoring pane.

Using Dose monitoring, on the Main Menu a list of all received exposure types per Digitizer technology and per speed class can be viewed.

For each entry in the dose reference value list, the median and standard deviation is calculated and the reference median and standard deviation is displayed.

For each exposure type it is possible to set a reference value or to update the reference value with the median and standard deviation of the 50 latest exposures or to remove exposure types.

An external dose consistency analysis program calculates several statistics with regard to doses, answering questions such as what sort of exposures are likely to be under- or overexposed.

Possible actions in the Dose Monitoring pane are:

- Fixing reference values.

  This is a reference LgM value (refLgM) or reference Exposure Index (target Exposure Index, TEI) which can be used as a guidance value when not enough statistics are available to have a proper average LgM value or reference Exposure Index.

- Updating reference values.

  This is updating the fixed reference value with the average LgM or EI value when a proper average value is available.
- Delete exposure types.

  This is removing exposure types and all statistics from the NX workstation.

Topics:

Fixing reference values

1. Select an exposure type by clicking the row of the exposure type.
2. Click the **Fix** button.

   The Fix Lgm/EI Mean Reference value dialog box appears:

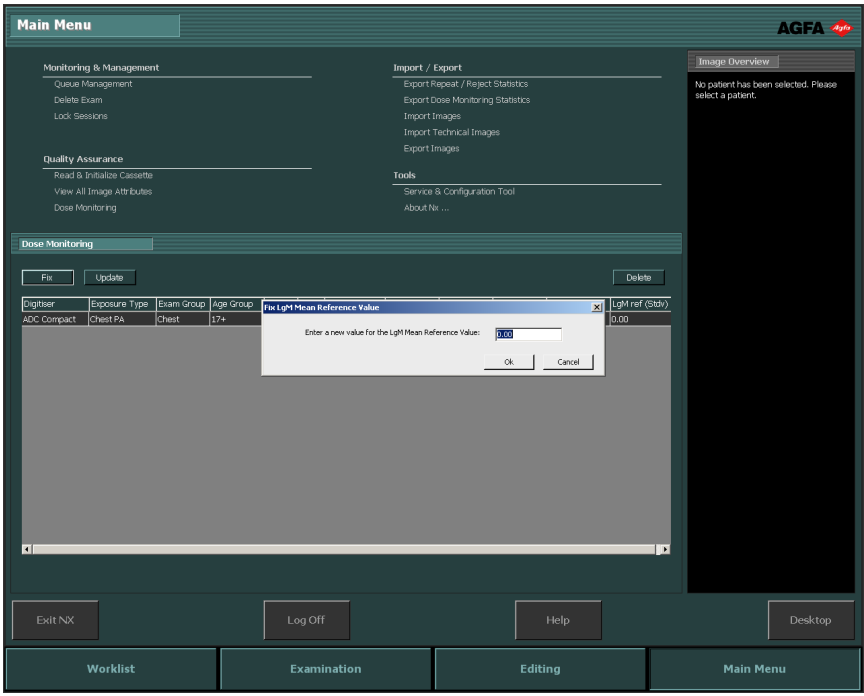


Figure 166: Fix Lgm/EI Mean Reference value dialog box

3. Enter a new value and click OK.

   The value is added to the refLgM (Avg) or the TEI (Avg) column of the Dose Monitoring pane.

Topics:

Updating reference values

1. Select an exposure type.
2. Click the **Update** button.

   The value of the refLgM (Avg) or the TEI (Avg) column is updated with the calculated average value.

Deleting an exposure value

1. Select an exposure type.
2. Click the **Delete** button.

   The exposure type is deleted from the list.

Note: The dose reference list will be empty if the room has no dose monitoring license.

Note: If you want to modify dose monitoring statistics on the Central Monitoring System, you first have to select a room as shown in the figure below.

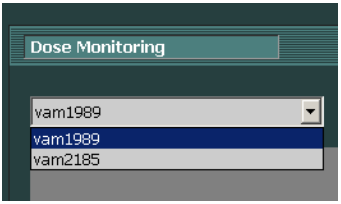


Figure 167: NX in-room workstation selecting for dose monitoring.

Dose monitoring

In computed radiography or direct radiography the image processing automatically adjusts the image density independently of the applied dose. In fact, this is one of the key advantages of the new technology. It helps to reduce the retake rate significantly, but at the same time this feature may hide occasional or systematic under- or overexposure.

While in conventional radiography or direct radiography the amount of exposure is directly related to average density, in computed radiography it determines the signal-to-noise ratio, not the image density. The higher the dose, the better the SNR. This is good news as such, but in the long term there is a risk of gradually drifting to higher doses, as the more exposed images tend

to look better. For that reason Agfa has developed a quality control tool called Dose Monitoring Software.

Depending on the installation your workstation will be configured in such a way that the dose monitoring will make use of LGM (Logarithmic Median) values or Exposure Index (EI) values.

Both are derived from the pixel histogram and only apply to the Region of Interest (areas with direct radiation on the detector and collimated areas on the tube are left out). Manual collimation will affect these values, only the area within the collimated zone is taken into account.

LgM is a logarithmic value that will respond in a logarithmic way to changes in the detector dose, EI is a linear value that respond in a linear way to changes in detector dose.

The higher the value the higher the detector dose (relatively) was. Since the X-ray beam quality influences the values, this is not an absolute dose measuring tool, but a good relative dose indicator to monitor your applied doses.

Dose monitoring will compare the LgM or EI of a image with a “reference LgM” or a reference EI (“Target Exposure Index”: TEI) and calculates the deviation which will be kept into the statistics and can be visualized on the NX by means of a bar graph.

In case of LGM values the system stores a reference LGM and a standard deviation on this reference value.

In case of an EI the system stores a Target Exposure Index (TEI) and a standard deviation on this TEI. Besides the EI, a Deviation Index (DI) is calculated and displayed on the NX for every image. The DI expresses the deviation of the EI from its TEI.

To manage the reference values for dose monitoring, click Dose Monitoring in the Functionality Overview pane of the Main Menu window.

Refer to "Suggested Radiographic References and User Guides" for more information on determining Target Exposure Index values.

Related Links

Modifying Dose Monitoring Statistics on page 266

Suggested Radiographic References and User Guides on page 307

A guide to “Exposure index of digital X-ray imaging systems” - IEC 62494-1 Standard.

Dose Statistics

NX stores records of the dose value (LgM or EI) and the deviation to the reference value for each exposure.

To export the dose record data, click **Export Acquired Dose Records** in the Functionality Overview pane of the Main Menu window. By default, only the records that have been added since the last export are exported.

To analyse the dose record data, click **Extended Dose Reporting** in the Functionality Overview pane of the Main Menu window. Extended Dose Reporting is available on installations configured to use Exposure Index (EI) values.

Related Links

Exporting Acquired Dose Records on page 277
Extended Dose Reporting on page 271

Extended Dose Reporting

Using Extended Dose Reporting, you can analyse the records of the dose value (EI) and the deviation to the reference value and the records of the dose area product (DAP) values, that are stored for each exposure. Records can be filtered and grouped on a set of attributes, e.g. exposure type, modality, equipment, operator, date and time. Outliers can be analysed separately.

To analyse the dose records:

1. Click **Extended Dose Reporting** in the Functionality Overview pane of the Main Menu window.

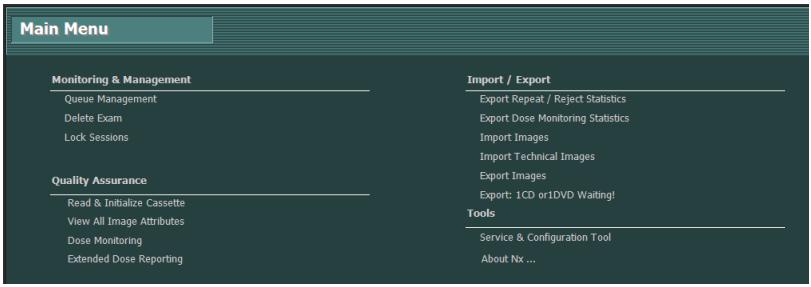


Figure 168: Main Menu window

   The **Extended Dose Reporting** window appears.
2. On the Central Monitoring System, select a room.
3. Limit the analysis by selecting specific values or by specifying a date range.
4. Select the type of values to be analyzed:
   - EI-DI Statistics: analyze EI and DI values for all selected exposures, grouped by exposure type and digitizer or detector type.
   - DAP Statistics: analyze DAP values for all selected exposures grouped by exposure type and digitizer or detector type.
   - DAP Statistics Protocol Code: analyze DAP values per protocol code for all selected exposures grouped by protocol code.
   - Outliers: analyze EI and DI values for all selected exposures for which the deviation of the dose value (EI) to the reference value corresponds to a specific overexposure or underexposure, grouped by exposure type and digitizer or detector type. The overexposure or underexposure is expressed by a minimum and maximum deviation index value (DI).
   - Exposure Info: list EI, DI and DAP values for each selected exposure.
5. Filter the data to be displayed by age group, exam group, exposure type, operator, digitizer or detector type.
6. Click **Start Analysis**.

   The results of the analysis are displayed in the table.

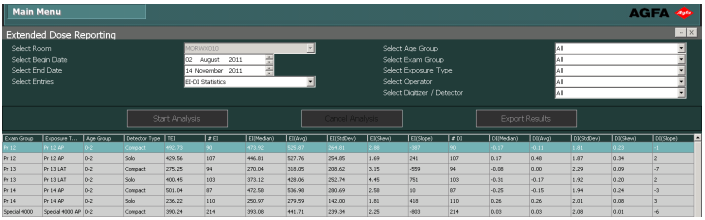
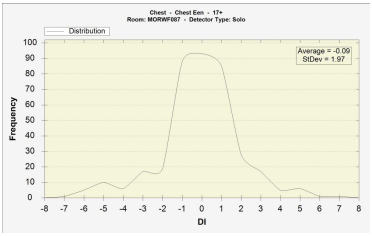


Figure 169: Analysis results

- TEI is the Target Exposure Index for the exposure type
- #EI is the number of exposures
- #DI is the number of exposures for which a deviation has been calculated
- EI is the Exposure Index
- DI is the Deviation Index
- DAP is the dose area product value
- #DAP is the number of exposures
- DRL is the diagnostic reference level. Click the table cell to enter a value. The DRL value will be visible in the trend and distribution charts.
- Median, Avg, StdDev; Skew and Slope indicate the statistic analysis results

7. Double-click a row to view basic trend and distribution charts. Charts can only be viewed in views containing statistical data and if sufficient data is available.

trend chart	distribution chart
	

Right-click the chart to save or print the chart. Click the chart to switch to the next chart or return to the Extended Dose Reporting window.

8. Click **Export Results** to export the results of the analysis.

   A Windows **Save As** dialog box appears. A default name and the format (xml) of the file are already displayed.

9. Select a location and click **Save**.

   The files can now be found in the destination folder. Two files are exported: an xml file and a html file. Use the html file to view the analysis

results in a browser. Use the xml file to import the data in a third party software tool. The html file is automatically opened in a browser window.

10. If the destination folder is a CD-writer drive, the following extra steps are required to perform the CD writing operation.

    On Windows 7 or 8

    a) The “Burn a Disk” window appears. Follow the instructions to write the file to CD/DVD.
    b) A dialog box may be displayed asking how the disk will be used. Depending on this choice, the disk may not be usable on other computers.

Extended Dose Reporting on another PC

To use Extended Dose Reporting on another PC, install the NX Offline Config tool on the PC first. The installer is available on the NX StarterKit DVD 1 in the folder Service Software.

To analyse a dataset:

1. On the NX workstation, click **Extended Dose Reporting** in the Functionality Overview pane of the Main Menu window.
2. Click **Export for Analysis**.

   A Windows **Save As** dialog box appears. A default name and the format (xml) of the file are already displayed.
3. Select a location and click **Save**.

   The files can now be found in the destination folder. Three xml files are exported.
4. Transfer to the files to a folder on the other PC.
5. On the other PC, go to the Windows Start menu > **Agfa** > **NX** > **Offline Config Tool** and click **Dose (EDR) Analysis Tool**.

   The **Extended Dose Reporting** window appears.
6. Click **Open XML File**.

   A Windows **Open File** dialog box appears.
7. Navigate to the folder where the export files are stored, select the exported file and click **Open**.

   By default the dialog only lists files with a filename as proposed during the export. Only one of three export files must be selected, the other files are retrieved from the same folder automatically.

The dose records can now be analysed.

Import/Export

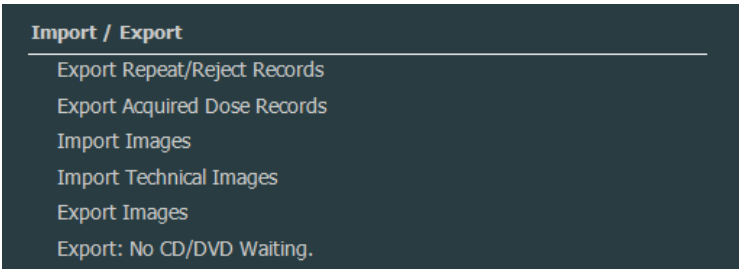


Figure 170: Import/Export section of the Functionality Overview pane.

Topics:

- *Exporting Repeat / Reject statistics*
- *Exporting Acquired Dose Records*
- *Importing Technical Images*
- *Exporting images*
- *Exporting automatically*

Exporting Repeat / Reject statistics

The Key user can export the Repeat/Reject logging files. This information, stored in XML format, can then be easily imported into a 3rd party software tool (not provided by Agfa) for consultation, for example Microsoft Excel. Also a formatted HTML file is automatically created in the same folder.

Procedure:

1. Click **Export Repeat/Reject Statistics** in the Functionality Overview pane of the Main Menu window.

   A dialog is displayed to specify the filename for the logging files.

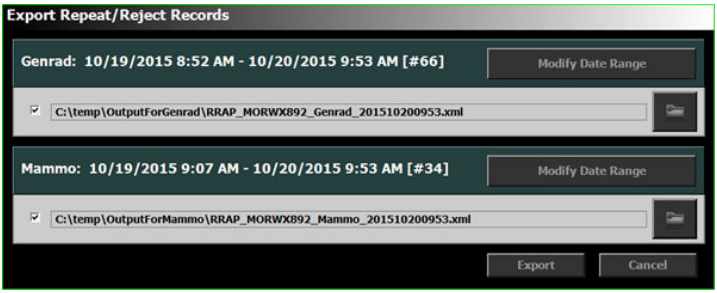


Figure 171: Export Reject Statistics

2. Check the checkboxes to export statistics for genrad or mammography exams or both.
3. To export data for a specific timeframe, click **Modify Date Range** and select a start and end date and time.

   By default, only the records that have been added since the last export are exported.

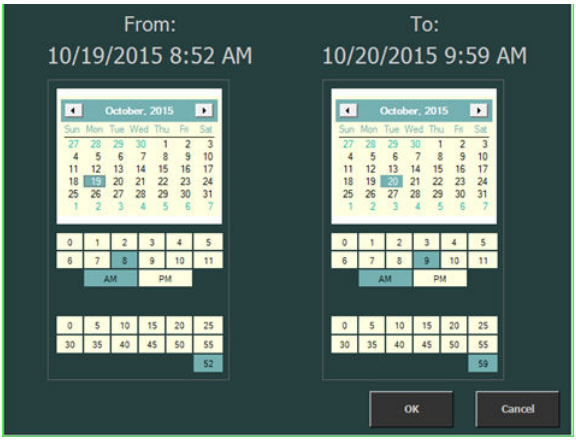


Figure 172: Start and end date and time dialog

4. For each file, click the folder button.

   A Windows **Save As**-dialog box appears; a default name and the format (xml) of the file are already displayed.
5. Select a location.
6. Click **Export**.

   The XML and HTML files can now be found in the destination folder.

   You can open the HTML by clicking it:

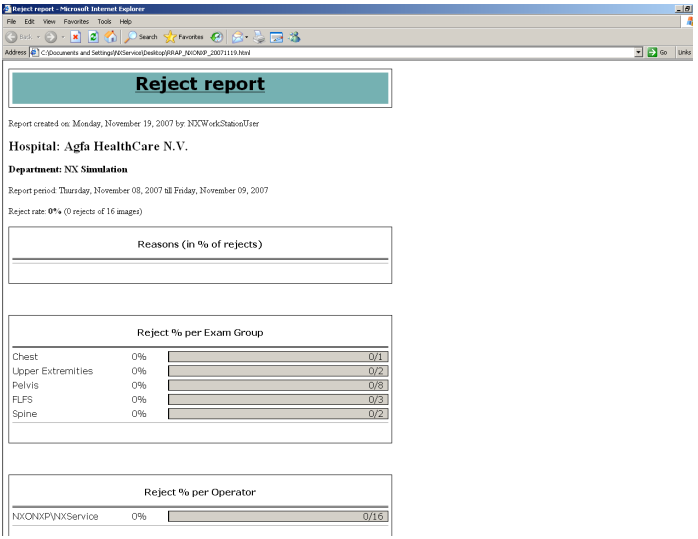


Figure 173: HTML report with Repeat/Reject statistics.

For printing the HTML report from your browser, it is advised to use landscape page orientation in the printer settings.

7. If the destination folder is a CD-writer drive, these extra steps are required to perform the CD-writing operation.

   On Windows 7 or 8

   a) The “Burn a Disk” window appears. Follow the instructions to write the file to CD/DVD.

   b) A dialog box may be displayed asking how the disk will be used. Depending on this choice, the disk may not be usable on other computers.

Exporting Acquired Dose Records

The Key user can export acquired dose records. This information, stored in XML format, can then be easily imported into a 3rd party software tool (not provided by Agfa) for consultation, for example Microsoft Excel.

To export acquired dose records:

1. Click **Export Acquired Dose Records** in the Functionality Overview pane of the Main Menu window.

   A dialog is displayed to specify the filename for the logging files.

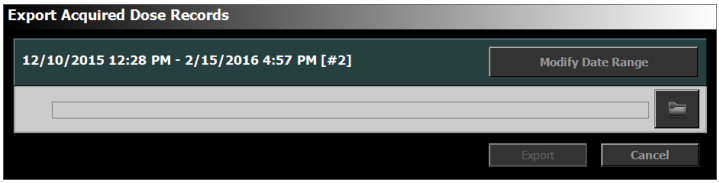


Figure 174: Export Acquired Dose Records

2. To export data for a specific timeframe, click **Modify Date Range** and select a start and end date and time.

   By default, only the records that have been added since the last export are exported.

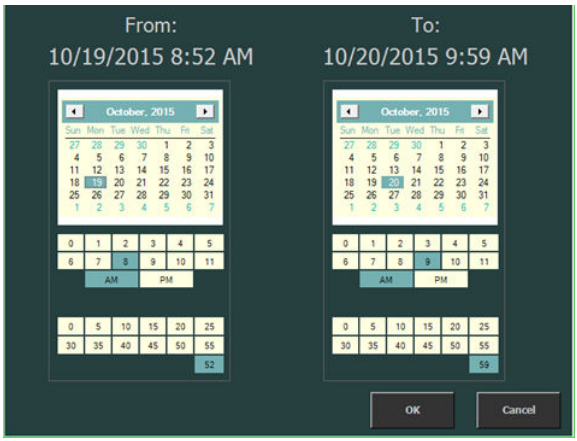


Figure 175: Start and end date and time dialog

3. Click the folder button.

   A Windows **Save As**-dialog box appears; a default name and the format (xml) of the file are already displayed.

4. Select a location.

5. Click **Export**.

   The XML files can now be found in the destination folder.

6. If the destination folder is a CD-writer drive, these extra steps are required to perform the CD-writing operation.

   On Windows 7 or 8

   a) The “Burn a Disk” window appears. Follow the instructions to write the file to CD/DVD.
   b) A dialog box may be displayed asking how the disk will be used. Depending on this choice, the disk may not be usable on other computers.

Importing Technical Images

Procedure:

1. Insert a CD (or other medium) containing technical images in DCM-format.
2. Click Import technical images in the Functionality Overview pane of the Main Menu window.

   A Windows **Import**-dialog box appears:

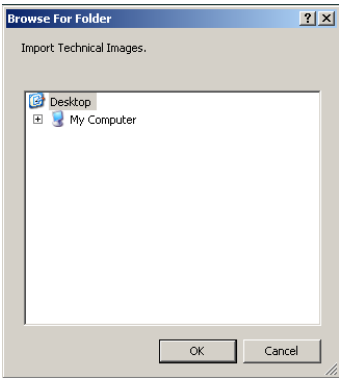


Figure 176: Import Technical Images dialog box.

3. Select the location of the files and click **OK**.

   The technical images are imported into the NX system. They can be retrieved in the Closed examinations list.

Note: *with this function it is possible to import AAPM TG 18 Test Patterns.*

Exporting images

On NX it is possible to export images from an examination to CD or DVD.

To export images

1. Go to the Main Menu.
2. Click Export images in the Functionality Overview pane of the Main Menu window.

   The Export Images pane is opened in the middle section of the Main Menu window.

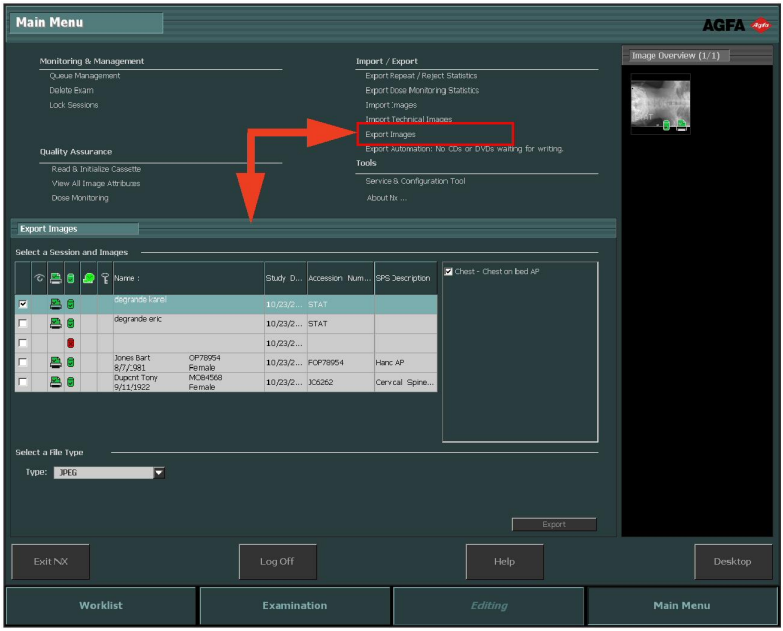


Figure 177: Export Images pane of the Main Menu window

3. Perform one of the following actions:

   - Select the checkboxes of the examinations you want to export (1) in the first column of the Export Images pane.
   - Decide to include or exclude images by selecting or deselecting the checkbox of the image in the Image Selection pane (2).
   - Select a file type in the File Type drop down box (3).

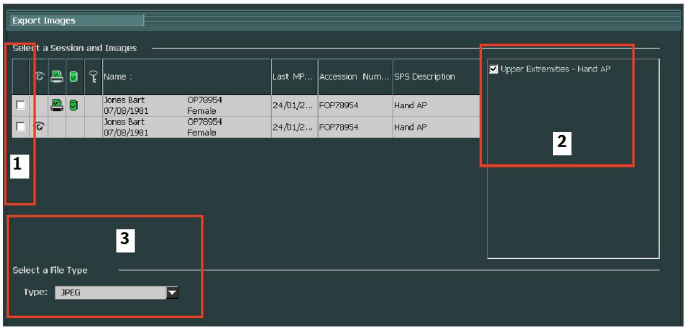


Figure 178: Export Images actions

Note: If you choose DICOM or Native as export format, you have the option to include patient demographics.

Note: Multiple DICOM export profiles can be configured.

Note: The DICOM export is IHE compliant only if the user or the RIS has provided a value for the Patient ID field.

4. Click **Export**.
5. Select a destination folder.
6. Click **Save**.

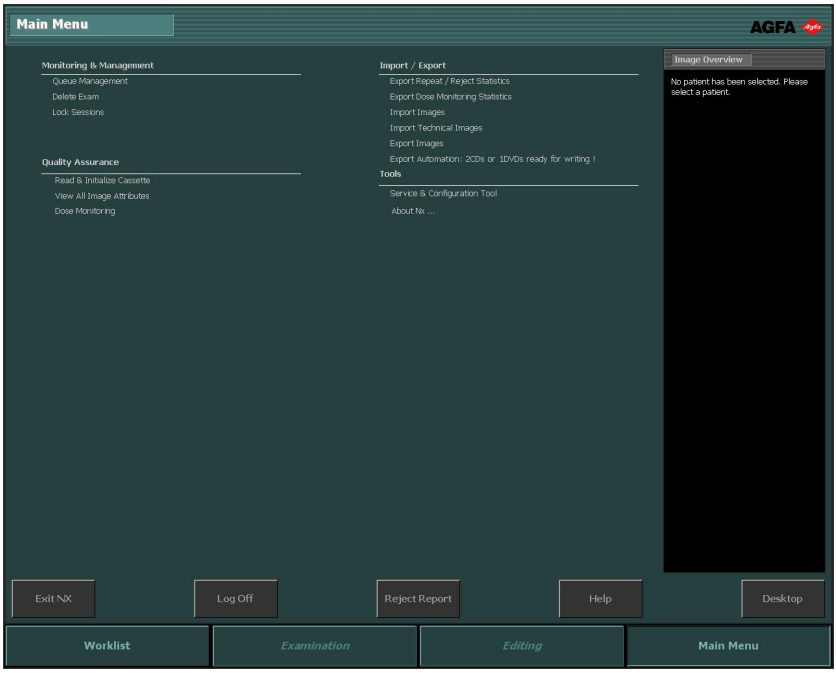
Exporting automatically

NX can be configured to write all images to CD or DVD. The images are put in a queue and at any moment you can start writing the images to a CD or DVD. Alternatively, when the hard disk space for buffering the images is full, you will be prompted to write the images to a CD or DVD.

To write images to CD or DVD

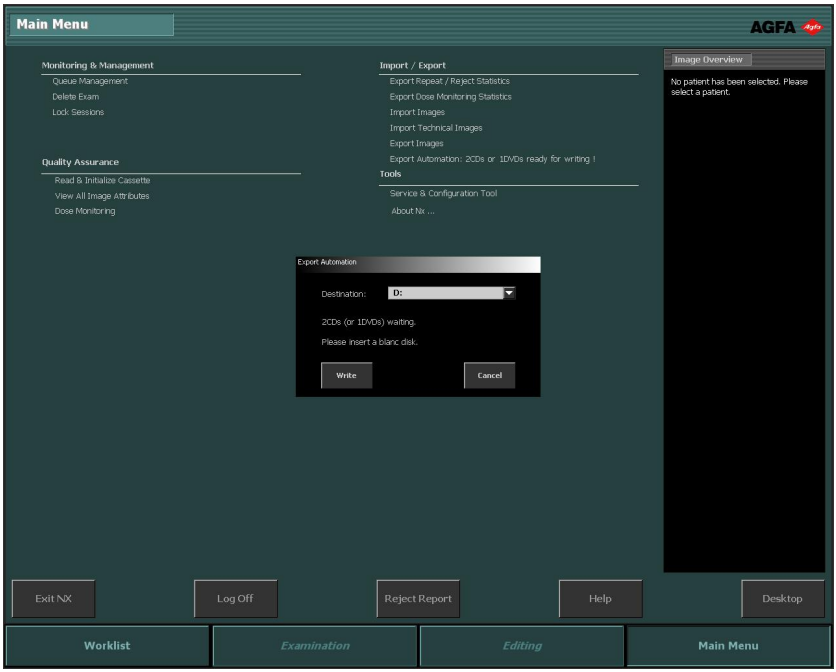
1. Go to the Main Menu.

   Under **Import/Export**, you will see the line **Export Automation** along with the number of CDs or DVDs needed to complete the export. The line is visible from the moment there are images ready to be written to CD/DVD.



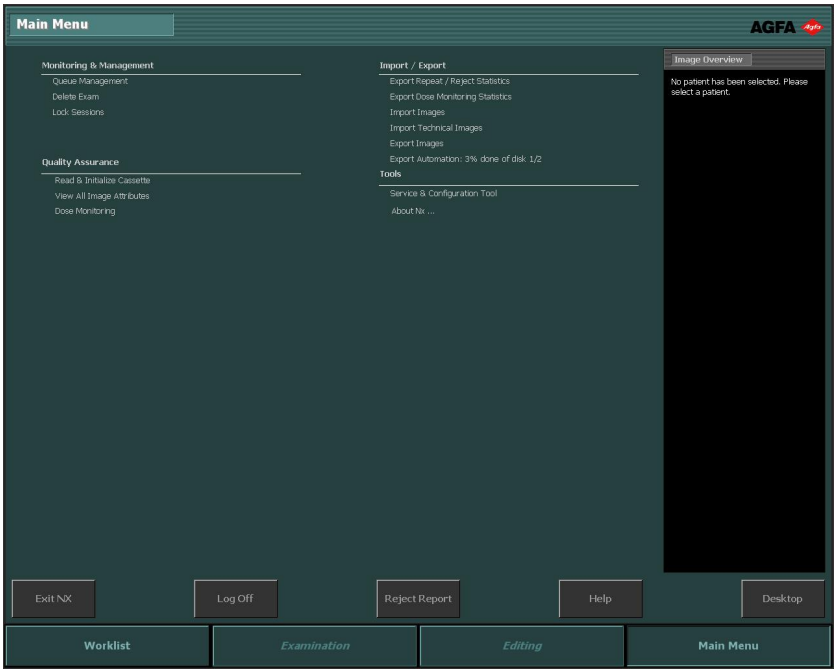
2. Click the **Export Automation** line.

   The **Export Automation** dialog box opens. In this dialog box you can enter the path of the CD/DVD writer drive.



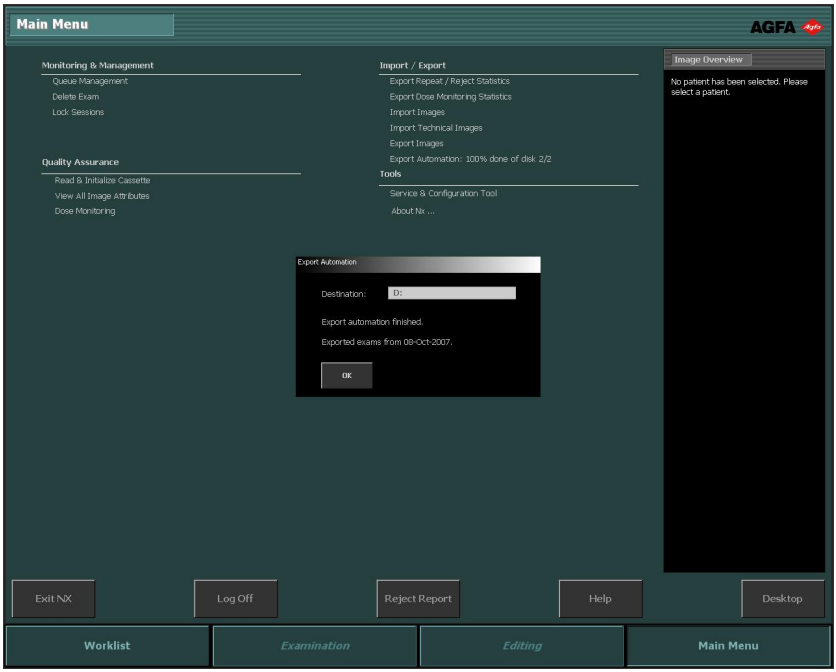
3. Insert a disk.
4. Click **Write** to start writing.

   The progress of the writing is shown next to the **Export Automation** line.



If multiple CDs are to be written and one CD/DVD is completed, the Export Automation dialog box will reappear and prompt you to select a destination and enter a new CD/DVD. Click **Write** again to continue writing.

After all images are written, a new dialog will appear with the message that writing is finished. The actual date is also shown. The operator can write this date on a label.



5. Click **OK** to close the dialog.

Tools

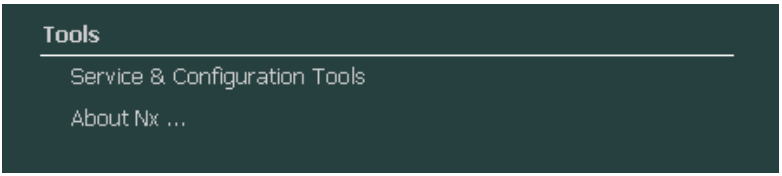


Figure 179: Tools section of the Functionality Overview pane.

Topics:

- *NX Service and Configuration Tool*
- *About NX*

NX Service and Configuration Tool

To open the NX Service and Configuration Tool:

Click **NX Service and Configuration Tool** in the Functionality Overview pane of the Main Menu window.

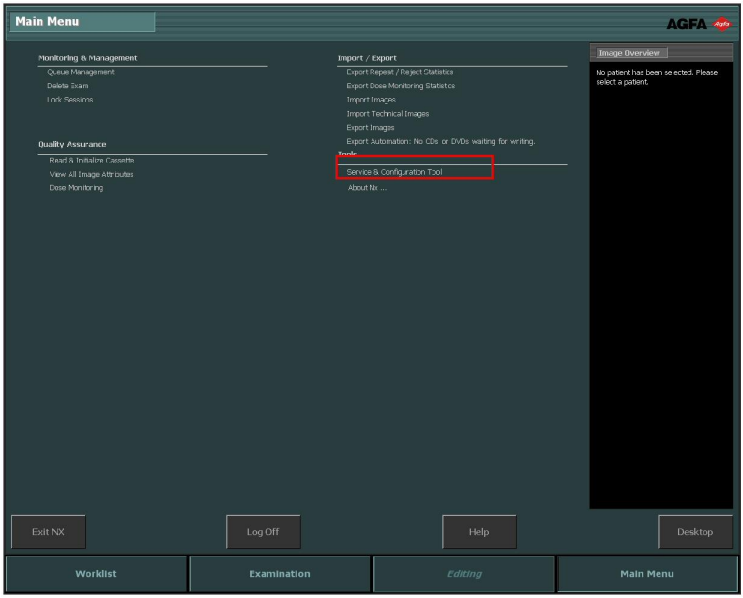


Figure 180: Main Menu window.

This is a link to the dedicated tool for setting up and modifying NX applications. Refer to the Key user manual for more information.

The date and time of the latest activation is displayed next to the link.

About NX

To consult the About box:

1. Click **About NX** in the Functionality Overview pane of the Main Menu window.

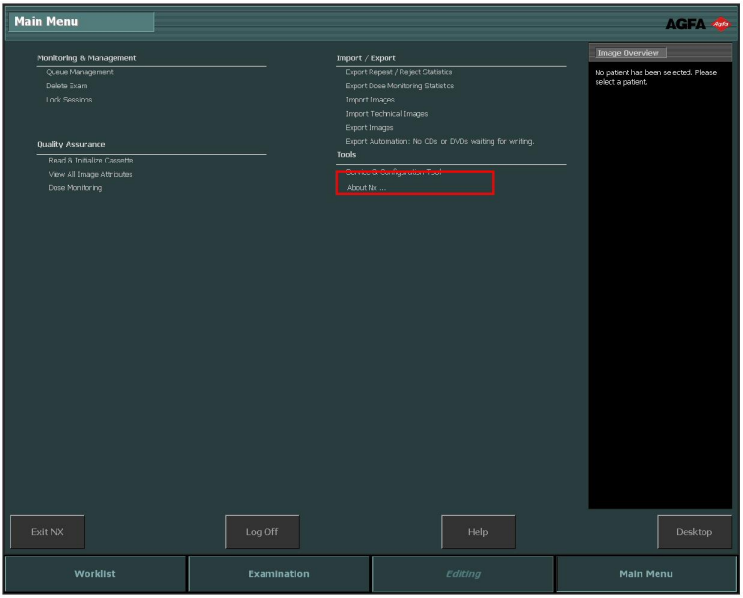


Figure 181: Main Menu window.

This will open the About box showing the current release and version details of NX in the lower right corner.

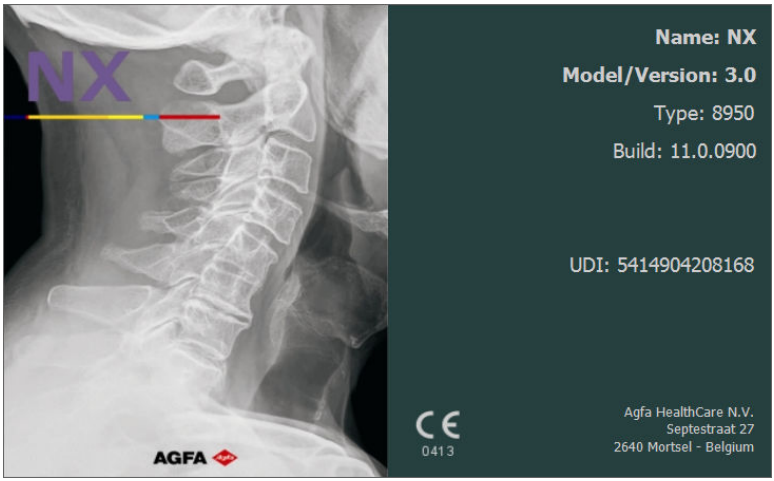


Figure 182: NX About box (Displayed data may be different).

Note: Always quote these details when you discuss any issues with Agfa service personnel.

2. Click on the dialog to close it.

Appendices

Problem Solving in NX

Topics:

Image is not displayed

Details	An image is acquired but not displayed in the examination.
Cause 1	The DR Detector could not send the image directly after the exposure to the NX workstation.
Brief Solution	If the image is stored on the DR Detector, it will become available after restarting NX. To restart NX, go to the Windows **Start** menu > **Agfa** > **NX** and click **Restart NX Completely**. The recovered image is available on the NX workstation in a new examination. It is processed using a default exposure type.
Cause 2	The digitizer could not send the image to the NX workstation where the image was identified and the image is rerouted to another NX workstation.
Brief Solution	If the image is stored on the digitizer, it can be rerouted to another NX workstation. For more information about rerouting images on the digitizer, refer to the digitizer User Manual. After rerouting, the recovered image is available on the other NX workstation in a new examination. It is processed using a default exposure type.

Only part of the image is displayed

Details	DR images and CR 10-X images are cropped to the collimation area that is automatically detected by NX. The cropping is intended to remove non relevant areas of the image. Nevertheless it can occur that the cropping makes useful diagnostic information invisible. In this case you must be able to turn black border and cropping off or re-collimate the image manually.
Cause	Failing auto collimation.
Brief Solution	This problem is solved by: • Turning off the black border and cropping. • Applying manual collimation. To prevent this problem, use the ROI detection exposure techniques as described in “Working with collimation”.
Solution Steps	To turn the black borders and cropping on or off: **1.** Select an image in the **Image Overview** pane. **2.** From the first drop-down list in the **Image Processing** tool section, select the following icon.  To draw a rectangular collimation area: **1.** Select an image in the **Image Overview** pane. **2.** In the **Editing** window, from the first drop-down list in the **Image Processing** tool section, select the icon below.  **3.** Click once to define one corner of the rectangle. **4.** Move the pointer. **5.** Click again to define the opposite corner. **6.** To display the collimation area, select the icon below.

To draw a polygonal collimation area:

1. Select an image in the **Image Overview** pane.
2. In the **Editing** window, from the first drop-down list in the **Image Processing** tool section, select the icon below.

3. Click to define the starting point.
4. Move the pointer and click to define each corner.
5. Click the starting point to close the polygon.
6. To display the collimation area, select the icon below.

Related Links

Working with collimation on page 217
Black borders and cropping on page 221
Applying collimation and cropping manually on page 221

Part of the image is masked by the black border

Details	During the automatic collimation process, NX normally applies black borders to the image. These black borders are intended to mask non relevant areas of the images. Nevertheless it can occur that the black borders do mask useful diagnostic information. In this case you must be able to either hide the black border or re-collimate the image manually.
Cause	Failing auto collimation.
Brief Solution	This problem is solved by: • Hiding the black border. • Applying manual collimation. To prevent this problem, use the ROI detection exposure techniques as described in “Working with collimation”.
Solution Steps	To show/hide black borders: **1.** The **Image Detail** pane in the **Examination** window has a set of buttons to perform basic operations on an image. With this button you can remove the black border in case of failed collimation. Click the button to show/hide black borders.  To draw a rectangular collimation area: **1.** Select an image in the **Image Overview** pane. **2.** In the **Editing** window, from the first drop-down list in the **Image Processing** tool section, select the icon below.  **3.** Click once to define one corner of the rectangle. **4.** Move the pointer. **5.** Click again to define the opposite corner.

6. To display the collimation area, select the icon below.

To draw a polygonal collimation area:

1. Select an image in the **Image Overview** pane.
2. In the **Editing** window, from the first drop-down list in the **Image Processing** tool section, select the icon below.

3. Click to define the starting point.
4. Move the pointer and click to define each corner.
5. Click the starting point to close the polygon.
6. To display the collimation area, select the icon below.

Related Links

Working with collimation on page 217
Performing quality control on the image on page 145
Applying collimation and cropping manually on page 221

NX is not running

Details	NX is not active, no activity takes place.
Cause	
Brief Solution	First check on the Windows taskbar if NX is running. Otherwise look in the Start Menu to start NX. You can also choose to reboot the system from the Start Menu.
Solution Steps	If you see NX in the taskbar, click NX in the taskbar. The NX application appears. Alternative solution: **1.** Click the NX start icon in the Windows Start menu or the shortcut icon on the desktop.

Related Links

Stopping NX on page 55
Starting NX on page 48

Window/Level setting is completely out of range

Details	During the auto processing of an image, NX calculates auto collimation parameters and applies these parameters (such as window/level settings) to the image. In specific situations, these auto collimation parameters may be wrong.
Causes	• automatic collimation failed to detect region of interest • region of interest is extremely small
Brief Solution	• If MUSICA image processing is used: apply manual collimation • If MUSICA2/MUSICA3 image processing is used: adjust the global contrast and intensity (window/level)
Solution Steps for MUSICA Image Processing	To manually draw a rectangular collimation area (for MUSICA image processing): **1.** Select an image in the **Image Overview** pane. **2.** In the **Editing** window, from the first drop-down list in the **Image Processing** tool section, select the icon below.  **3.** Click once to define one corner of the rectangle. **4.** Move the pointer. **5.** Click again to define the opposite corner. **6.** To display the collimation area, select the icon below.  To manually draw a polygonal collimation area (for MUSICA image processing): **1.** Select an image in the **Image Overview** pane.

	2. In the **Editing** window, from the first drop-down list in the **Image Processing** tool section, select the icon below.  3. Click to define the starting point. 4. Move the pointer and click to define each corner. 5. Click the starting point to close the polygon. 6. To display the collimation area, select the icon below. 
Solution Steps for MUSICA2/ MUSICA3 Image Processing	To adjust the global contrast and intensity (for MUSICA2/MUSICA3 image processing): 1. Select an image in the **Image Overview** pane. 2. Select the following icon.  3. Use the mouse to adjust the global contrast and intensity. 4. When the desired contrast and intensity have been reached, click in the image pane.

Related Links

Applying collimation and cropping manually on page 221
Changing the global contrast and intensity of an image (window/level) on page 224

Archive button is disabled

Details	After you have performed the quality control tasks and have inspected the images of a study on the NX station, the image must normally be sent to an archive (or a printer, depending on your workflow). You must know that you can only archive an image once. So when an image is archived, it can still be consulted at the NX station but cannot be archived again (the Archive button is disabled). If you still want to archive the image a second time, you have to save it as a new image. The archive button can also be disabled because the image has been rejected. In this case you need to unreject the image if you want to archive it.
Cause	Image has already been archived before. The image has been rejected.
Brief Solution	Saving the image as a new image.
Solution Steps	To save a processed image as a new image: **1.** Go to the **Editing** window. **2.** Select an image in the **Image Overview** pane. **3.** Process the image. **4.** In the **Editing** window, click **Save as New**. The processed image is added to the exam and appears in the **Image Overview** pane. To unreject an image: **1.** Select the image in the **Image Overview** pane. The image is displayed in the **Image Detail** pane. **2.** Click **Unreject Image**.

Related Links

Saving a processed image as new image on page 175
Rejecting/unrejecting an image on page 147

Archive cannot be selected in drop down list

Details	After you have performed the quality control tasks and have inspected the images of a study on the NX station, the image must normally be sent to an archive (or a printer, depending on your workflow). You must know that you can only archive an image once. So when an image is archived, it can still be consulted at the NX station but cannot be archived again (the archive cannot be selected anymore from the list of archives). If you still want to archive the image a second time, you have to save it as a new image.
Cause	Image has already been archived to that archive.
Brief Solution	Saving an image as a new image.
Solution Steps	To save a processed image as a new image: **1.** Go to the **Editing** window. **2.** Select an image in the **Image Overview** pane. **3.** Process the image. **4.** In the **Editing** window, click **Save as New**. The processed image is added to the exam and appears in the **Image Overview** pane.

Related Links

Saving a processed image as new image on page 175

DR Detector is out of order

Details	The DR Detector status is red.
Cause	The communication between the NX workstation and the DR Detector is lost.
Brief Solution	**1.** Stop NX completely. To stop NX completely, go to the Windows Start menu > **Agfa** > **NX** > **Service** and click **Stop NX** and confirm the procedure by pushing enter in the command window. **2.** Restart the X-Ray system. This will restart the fixed DR Detector that is part of the X-Ray system. Refer to the X-Ray system user manual for more information. **3.** Start NX. To start NX, go to the Windows Start menu > **Agfa** > **NX** and click **Restart NX Completely**. **4.** Restart the portable DR Detector. Refer to the DR Detector user manual for more information.

Cassette is identified with the wrong exposure - detected prior to scanning

Details	Normally you select an exposure at the NX station, insert the cassette with the exposure in the ID Tablet and then identify the exposure by pressing the ID button. It may be possible that you have initially selected the wrong exposure at NX and identify this cassette with the wrong exposure. You must be able to solve this mistake by making a new identification.
Cause	User mistake.
Brief Solution	Re-identifying with the right exposure.
Solution Steps	To re-identify a cassette with the right exposure: **1.** Re-insert a cassette in the ID Tablet. **2.** Select the correct thumbnail in the **Exam Overview** pane. **3.** In the **Examination** window, click **ID**.

Related Links

Identifying the cassettes on page 79

Cassette is identified with wrong exposure and the image has been received

Details	Normally you select an exposure at the NX station, insert the cassette with the exposure in the ID Tablet and then actually identify exposure by pressing the ID button. It may be possible that you have initially selected the wrong exposure at NX and identify this exposure with the wrong cassette. If you discover this mistake when the image is already digitized and displayed on NX, you must be able to solve this mistake by editing the data of the exposure (without re-identifying or re-digitizing the cassette).
Cause	User mistake.
Brief Solution	Edit exposure data.
Solution Steps	To edit the exposure data: **1.** Go to the **Examination** window. **2.** Make sure the image you want to edit is selected. **3.** Click **Edit** in the **Image Detail** pane. The **Edit Image Detail** pane opens on top. **4.** To change the **Exposure Type**, click the button displaying the exam/exposure name. This brings up the Add Image dialog where you can select the new exam/exposure type. After you have selected an exposure type, this dialog closes automatically. **5.** Click **OK** to apply the changes and close the Edit dialog.

Related Links

Selecting the correct examination after the image has been received on page 149

Cassette is identified with the wrong patient data due to a user mistake

Details	It is possible that an image displayed on NX in conjunction with wrong patient data. This can be caused by identifying cassettes with wrong patient data. In this case, the most efficient solution is to transfer the image from one examination to an other (from the wrong to the correct patient).
Cause	User mistake.
Brief Solution	Transfer an image to the right patient.
Solution Steps	To transfer images to the right patient: 1. In the **Worklist** window, select the exam from which you want to transfer the images. The images are displayed in the **Image Overview** pane. 2. Click **Transfer Images**. The **Transfer Images** wizard opens. 3. In the **Image Overview** pane, select the image(s) that you want to transfer. The image is displayed in the wizard. 4. Click **Continue**. 5. In the **Worklist** window, select the exam to which the image should be transferred. The patient data is displayed in the wizard. 6. Click **Continue**. A transfer overview is displayed to check if all information is correct. 7. Click **Finish**. The image is transferred.

Related Links

Transferring images from one exam to another on page 119

Error "no valid image plate gain calibration file found" when identifying cassette for DX-M digitizer

Details	When identifying a cassette, this error is displayed: “Error, no valid image plate gain calibration file found”. The cassette cannot be used.
Cause	The IP gain calibration file is not available on the NX workstation.
Solution 1: if the IP Gain Calibration CD is available	Fetch the CD labeled “IP Gain Calibration” that is delivered with the cassette and load the IP gain calibration file on the NX workstation.
Solution Steps	To install the gain calibration file: **1.** Insert the CD in the NX Workstation. **2.** Browse to the CD. **3.** Run the application ‘install.exe’. **4.** Follow the instructions on the screen.
Solution 2: if the IP Gain Calibration CD is not available	Contact the Service organization.

Suggested Radiographic References and User Guides

A guide to “Exposure index of digital X-ray imaging systems” - IEC 62494-1 Standard.

The IEC 62494-1 Exposure Index standard provides a standard way to measure the exposure to a digital detector. Exposure Index should be used to provide a reference guide for each exam view within department and to monitor variations in exposure within an exam type. The standard consists of three values, Exposure index (EI), target exposure index (TEI), and deviation index (DI).

The EI is related to the amount of radiation reaching the detector. The EI is directly proportional to exposure, doubling the mAs will double the EI value. Reducing the mAs in half will reduce the EI will in half. The EI is also a function of the region of interest (ROI) selected by the NX workstation for the examination type, image processing, and exposure used. If the ROI selection is done incorrectly, either by the system or operator intervention, then the EI will be incorrect.

The target exposure index or TEI is the reference exposure index obtained when an image is exposed correctly. It is dependent on the body part, view, procedure, imaging receptor and image quality required. It should be determined by the user based on the image quality and dose desired.

The deviation index or DI quantifies how much the actual EI varies from the Target Exposure index. In an ideal situation, where EI and TEI are the same, DI will be zero. DI values of 1.0 and 3.0 correspond to 26% and 100% overexposure, respectively. Conversely, DI values of –1.0 and –3.0 correspond to 20% and 50% underexposure, respectively. The DI value gives immediate feedback to the user about the adequacy of the exposure1.

Table 1: Relationship between EI, TEI and DI for a TEI of 400

Agfa NX EI Value*	Target Exposure Index (TEI)	DI	Exposure Factor	% Change
1640	400	6.1	4.1	310%
1000	400	4	2.5	150%
900	400	3.5	2.25	125%
800	400	3	2	100%

Agfa NX EI Value*	Target Exposure Index (TEI)	DI	Exposure Factor	% Change
640	400	2	1.6	60%
504	400	1	1.26	26%
400	400	0	1	0%
320	400	-1	0.8	-20%
240	400	-2.2	0.6	-40%
200	400	-3	0.5	-50%
180	400	-3.5	0.45	-55%
160	400	-4	0.4	-60%
98	400	-6.1	0.25	-76%

(* Agfa NX workstations use the IEC 62494-1 Exposure Index standard)

Determining Target Exposure Index Values

Agfa provides a useable range of target exposure index values which will achieve acceptable image quality based on the detector type used. The final target exposure index (TEI) selected by the user for each examination should be within this range. CsI - detectors operate typically around a speed class of 400 system with a TEI between 250 and 750 for general radiography and a TEI between 500 to 1000 for extremities. As the TEI is increased the dose is increased and the noise in the images is decreased.

For example: for a chest radiograph one facility might select 275 as the target exposure index. A second site with the same equipment might select 500. Both facilities should have diagnostically acceptable images, but the images created at the site using 275 as their target exposure index will use less dose and will have higher noise.

If the TEI is properly selected the majority of actual exposure index values will fall within +3 to - 3 DI (deviation units) or ± 2 x from the target exposure index for manual exposures. For example: If the target exposure index selected is 400 the majority exposures should fall between 200 and 800 in EI. This is due to normal patient and exposure variation.

[Don Steven, B.R. Whiting, L.J. Rutz, B.K. Apgar. December 2012. New Exposure Indicators for Digital Radiography Simplified for Radiologists and Technologists. American Journal of Roentgenology, 199, 1337-1341]

Patient Age Groups

The NX Workstation can use patient age to apply unique image processing and display settings. When used with Agfa DR systems the NX workstation can

also be configured to provide default (average) exposure settings (kVp, mAs, etc.) by age. These default exposure settings appear when the system or operator selects a given exposure view and patient age, based on information provided automatically from the RIS or from patient records.

The default exposure settings should be determined by the user using good radiographic practice and the ALARA principle. They should be based on the target exposure index and image quality desired. This ensures that the appropriate image quality and patient dose is achieved.

The default exposure settings should be guidelines that work for the average size patient within a given age group at the specific facility. The user should always use appropriate techniques and set the final exposure settings as needed based on the proper measurement of the patient regardless of age.

The following reference provides the most current data for anteroposterior and transverse body diameter for pediatric patients ranging in age from 0.5 to 20 years.

Table 2: Mean Thickness in CM Per Body Part

Kleinman, P. L., K. J. Strauss, D. Zurakowski, K. S. Buckley, and G. A. Taylor. 2010. Patient size measured as a function of age at a tertiary care children's hospital. American Journal of Roentgenology, 194, 1611-1619

Age Group	Skull		Thorax		Abdomen		Pelvis	
	AP	Lat	AP	Lat	AP	Lat	AP	Lat
0-1.5	16.0	13.3	12.2	16.9	11.1	15.7	10.4	15.4
1.6-5	17.9	14.8	13.7	19.2	12.6	18.1	11.9	18.3
6-12	19.3	15.8	17.1	24.5	15.8	23.4	15.4	24.9
13-16	20.0	16.3	20.4	29.5	19.0	28.5	18.7	31.2
17+	20.5	16.7	23.7	34.6	22.1	33.6	22.1	37.5

Reference Guides

The following is a list of textbooks and references which can be used as guides for appropriate radiographic practice, exposures and procedures.

Publications

- Textbook of Radiographic Positioning and Related Anatomy, 7th Edition By Kenneth L. Bontrager, MA, RT(R) and John Lampignano, MEd, RT(R) (CT)
- Merrill's Atlas of Radiographic Positioning and Procedures, 12th Edition By Eugene D. Frank, MA, RT(R), FASRT, FAEIRS, Bruce W. Long, MS,

RT(R)(CV), FASRT and Barbara J. Smith, MS, RT(R)(QM), FASRT, FAEIRS

- Principles of Radiographic Imaging: An art and a science, 5th Edition Carlton/Adler
- Willis, C. E. Optimizing Digital Radiography of Children. European Journal of Radiology 72. e-Pub 3/2009.
- Cohen, M.D., R.Markowitz, J. Hill, W. Huda, P. Babyn, and B. Apgar. 2012, Quality assurance: a comparison study of radiographic exposure for neonatal chest radiographs at 4 academic hospitals. Pediatric Radiology 42(6):668-73
- http://www.ncbi.nlm.nih.gov/pubmed/22057362

Web Based Information (subject to change)

- Image Gently - Back to Basics Digital Radiography resources http://www.pedrad.org/associations/5364/ig/
- European guidelines on quality criteria for diagnostic radiographic images in paediatrics ftp://ftp.cordis.europa.eu/pub/fp5-euratom/docs/eur16261.pdf
- FDA Pediatric X-ray Imaging webpage http://www.fda.gov/Radiation-EmittingProducts/RadiationEmittingProductsandProcedures/MedicalImaging/ucm298899.htm
- ACR-SPR PRACTICE GUIDELINE FOR GENERAL RADIOGRAPHY http://www.acr.org/~/media/ACR/Documents/PGTS/guidelines/General_Radiography.pdf
- ACR-AAPM-SIIM PRACTICE GUIDELINE FOR DIGITAL RADIOGRAPHY http://www.acr.org/~/media/ACR/Documents/PGTS/guidelines/Digital_Radiography.pdf
- NCRP Report No. 172 - Reference Levels and Achievable Doses in Medical and Dental Imaging: Recommendations for the United States (2012) http://www.ncrppublications.org/Reports/

For further information contact Agfa Healthcare.

Automatic exposure control device response & patient dose

Image quality loss due to uncalibrated AEC device

Details	Noticeable decrease in image quality (noise)
Cause	The specific X-Ray scattering of the photostimulable phosphors can influence the response of the automatic exposure device, which is above the cassette. The exposure will be stopped earlier and the patient dose will be reduced accordingly. Lower dose goes together with lower image quality (signal-to-noise ratio).
Solution	The user has two options: keep the lower patient dose with a noticeable decrease in image quality or compensate for this loss of image quality. This compensation can be done by providing an additional exposure step (20%) or by setting the automatic exposure device less sensitively. Such interventions are not to be interpreted as increasing the patient dose, but as bringing the dose to its normal level. The AEC must be recalibrated and optimized for the new system in order to give the correct cut-off dose and the according image quality. Cut-off doses are subject to local legislation. The calibration of the AEC has to be done with the CR cassette or DR detector present in the bucky.

Glossary

Term	Explanation
AEC	Automatic Exposure Control
ATNA	Audit Trail and Node Authentication
CR	Computed Radiography, using a phosphor plate to capture the X-Ray image and a digitizer to read it and send it to the workstation.
Collimation	Collimation is performed during exposure using the tube collimator, to expose only part of the full exposure field. The collimation area is used by the software to apply black borders. DR images and CR 10-X images are automatically cropped at the collimation borders.
Cropping	Selecting a rectangular area on an image and displaying only the contents of this area.
Destination	A destination is a device to which the studies are routed after they have been digitized.
DI	Deviation Index : a number quantifying the deviation of the actual exposure index from a target exposure index
DICOM	Digital Imaging and Communication in Medicine.
DICOM gateway	The DICOM gateway is the DICOM input port on the workstation which enables it to 'load' the images.
Digitizer	The Digitizer scans the exposed image plate, converts the information into digital data and automatically transfers the image to the image processing station for further processing and visualization.
DR	Direct Radiography, using a digital image sensor to capture the X-Ray image and send it directly to the workstation.
EI	Exposure Index: measure of the detector response (on a linear scale) in a relevant image region of an image.
Exposure type	An Exposure type is a set of parameters (concerning image processing, exposure options such as view position and cassette orientation, and collimation) which are by default used for a defined type of exposure.

Term	Explanation
	A number of Exposure types make up an Exam group.
Graphical Help	Graphical help is based on a simulation of the application. You browse through the simulation until you get to the part (field, button, etc.) you have a question with. Clicking on this object will open the related part of the help system.
GSPS	A license which allows annotations to be removed on the PACS archive. Only annotations can be removed, markers are burnt on the image.
HIPAA	Acronym for the Health Insurance Portability and Accountability Act of 1996. It is a set of rules to be followed by health plans, doctors, hospitals and other health care providers. It took effect on April 14, 2003.
ID Tablet	Hardware device for performing identifications of cassettes.
LGM	Logarithmic median Value. The median value of the measured pixel values. This is used as a relative measure for the detector-dose.
License	A digital permit containing descriptions of rights that can be applied to one or more pieces of content.
Local database	Database stored on the hard disk of a workstation.
Marker	A marker behaves differently as compared to an annotation. It is always burnt onto the image when it is sent out by DICOM, even when GSPS is used.
Medical printer	Printer used to produce diagnostic hardcopies of radiographic images.
MUSICA	Multi-Scale Image Contrast Amplification.
P mode	Print mode.
PACS	Picture Archiving and Communication System.
Protocol code	A code that completely defines and identifies a specific exposure type. Protocol codes are imported from the RIS, and can be linked to exposure groups, exposures and exams that are displayed in the user interface. This way, an incoming protocol code can be “resolved” and

Term	Explanation
	the operator receives immediate feedback on the examination he needs to perform.
PVI	Pixel Value Index: average of the digital value of all pixels in a region of interest of an image, expressed as a logarithmic value.
Remote database	Database stored on a remote volume.
RIS	Radiology Information System.
SAL	Average of the digital value of all pixels in an image or a region of interest of an image. Expressed in terms of SQRT (exposure).
SALlog	Scan Average Level Logarithmic : average of the digital value of all pixels in a region of interest of an image, expressed as a logarithmic value.
Speed class	Sensitivity of the plate emulsion. Parameter necessary in defining exposure types.
TEI	Target Exposure Index: expected value of the Exposure Index when exposing the X-ray image receptor properly.
Web 1000	Web1000 is a system to provide web-based distribution over hospital networks of (archived) examinations.