GE Healthcare

Centricity™ Cardio Workflow Version 7.0 SP8

User Manual

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Revision 1

Disclaimer

The information in this manual only applies to the Centricity Cardio Workflow 7.0 SP8 configuration in effect at time of shipment from the factory. Due to continuing product innovation, specifications in this manual are subject to change without notice.

DISCLAIMER FOR EXTERNAL LINKS

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Revision History

Each page of this document has the document part number and revision number at the bottom of the page. The revision number identifies the document's update level.

Revision	Comment
1	Initial Revision for Centricity Cardio Workflow (CCW) 7.0 SP8 based on DOC2384609 Centricity Cardio Workflow 7.0 SP7 User Manual – Revision 1. Added: - Chapter 1.1: Client Basic Requirements. - Option to mark billing codes as Do Not Bill in the Billing Cockpit in chapter 9.9. - Chapter 18: Report Template Designer. Updated: - Steps to log delivered articles when using a barcode scanner in chapter 16.3.2. - Steps to log incoming materials when using a barcode scanner in chapter 16.4.2. - Steps to decrement materials when using a barcode scanner in chapter 16.4.3.

Related Documents

The latest revision of this document is made available through the Customer Documentation Portal (CDP). For a complete list of documentation valid for the current product release, navigate to the CDP by clicking on the following link, or copy and paste the link to the address line of your browser:

https://www.gehealthcare.com/en/support/support-documentation-library

Conventions and Notations

Regular text is typeset in GE Inspira.

Items shown in **Bold** text are keys on the keyboard, text to be entered, or hardware items such as buttons or switches on the equipment.

Items shown in *Italicized* text are software terms that identify windows, menu items, buttons, or options in various windows.

To perform an operation that appears with a plus (+) sign between the names of two keys, you press and hold the first key while pressing the second key once. This is called a keystroke combination. For example, "Press **Ctrl+Esc**" means to press and hold down the **Ctrl** key while pressing the **Esc** key.

When instructions are given for typing a precise text string with one or more spaces, the point where the spacebar must be pressed is indicated as: **<Space>**. The purpose of the < > brackets is to ensure you press the spacebar when required.

Enter means to press the **Enter** or **Return** key on the keyboard. Do not type "enter".

Text may be accompanied by symbols throughout this manual to provide additional information, point out hazards, and to designate a degree or level of seriousness. Familiarize yourself with their definitions and significance.

Hazard is defined as a source of potential injury to a person.

CAUTION: Indicates a potentially hazardous situation, which, if not avoided, may result in minor or moderate injury.

WARNING: Indicates a potentially hazardous situation, which, if not avoided, could result in death or serious injury.

Standards and Regulations

This manual is an integral part of the product and describes its intended use. Observance of the manual is a prerequisite for proper product performance and correct operation and ensures patient and operator safety.

GE Healthcare is responsible for the effects on safety, reliability, and performance of the product, only if:

- assembly operations, extensions, readjustments, modifications, or repairs are carried out by persons authorized by GE Healthcare;
- the hardware our product is installed on meets the provided minimum hardware requirements; and
- the device is used in accordance with the instructions for use.

The manufacturer is not responsible for any interference caused by using other than recommended interconnect cables or by unauthorized changes or modifications to this equipment. Unauthorized changes or modifications could void the users' authority to operate the equipment.

The GE Healthcare quality management system complies with the international standards ISO13485 and the Council Regulation (EU) 2017/745 Annex IX Chapter I and Section 4.

If you require a printed version of this user manual, please request it via your service representative.

Compliance with Regulatory Requirements

Centricity Cardio Workflow bears the CE mark, indicating its conformity with the provisions of the Council Regulation (EU) 2017/745 on medical devices and fulfills the general safety and performance requirements of Annex I of this regulation.

Year of first CE mark: January 2001

The authorized representative for GE Healthcare in Europe is:

EC REP

GE Medical Systems SCS
283 rue de la Minière
78530 BUC, France

The country of manufacture can be found in the About screen of the product.

The safety and effectiveness of this device has been verified against previously distributed devices. Although all standards applicable to presently marketed devices may not be appropriate for prior devices, this device will not impair the safe and effective use of those previously distributed devices.

Reporting of Serious Incidents

Any serious incident related to the use of this GE Healthcare device should be reported to both the manufacturer and the health authority/competent authority where the device is installed.

To report to GE Healthcare:

- Either contact your local service representative
- Or report to: In-box.complaints@ge.com

Please provide the following information:

- The catalogue number or the model designation of the device as stated on its identification plate affixed on the device
- The System ID/serial number/lot number of the device
- The date of incident
- The description of incident, including any patient or user impact/injury
- Your contact information (facility, address, contact name, title, and telephone number)

Contents

1 Overview

CCW is an interactive clinical information management system intended to support clinical documentation and operational departmental activities in cardiology departments. The system supports care by providing the following functionality:

- Creation of electronic physician procedural reports that can be printed, emailed, and exported to other systems, e.g. Hospital Information System, Electronic Medical Record, etc. This allows for treatment pathway design and visit management.
- Interface with other hospital information systems and medical devices for automatic data acquisition, viewing, and storage with the electronic patient record.
- Electronic scheduling supports workflow and manages content relating to scheduling of services in a cardiology department.
- Managing inventory shelf count and usage. Charge capture billing management to aggregate procedure and inventory charge codes to facilitate charge capture for the clinical procedure.
- Operational and clinical statistical reporting enable access to reliable structured data that can be used for a variety of quality and performance analysis.

The system can receive and display data secondarily from medical devices or other information systems. However, CCW should not be used for the direct monitoring of physiological processes and parameters, or as a definitive diagnostic tool for clinical or disease states. The documentation managed by CCW, in combination with the physiological information available from the primary diagnosis and monitoring systems as well as other medical examination results, may be used to influence future clinical decision making and treatment.

1.1 Client Basic Requirements

The specifications listed below are the minimum hardware and software requirements necessary to run the CCW 7.0 SP8 Client:

- Microsoft Windows 10 (32-bit or 64-bit) operating system
- Operating System Disk Partition: 100 GB
- 8 GB RAM or more
- Screen resolution 1280 x 1024
- Adobe Acrobat Reader
- For accessing the Scheduler, any of the following browsers:
  - Microsoft Edge, version 12 and higher
  - Google Chrome, version 45 and higher
  - Microsoft Internet Explorer, version 11

1.2 Safety and Security Information – Intended Use

The CCW product is an information system software solution for compiling, transferring and structuring information. CCW is intended to store and provide access to patients' complete cardiological electronic medical record, integrating information and data from Cardiology departments. This software is not intended to allow direct diagnosis.

CCW is designed to facilitate workflows, such as patient scheduling, device interfacing and data consolidation, procedure event tracking, results reporting, patient record retrieval, management of inventory, and statistical capabilities to measure department financial and resource productivity.

CCW interfaces with Computed Tomography (CT), Magnetic Resonance Imaging (MRI), Cath, Echo, Electrophysiology (EP), ECG, Stress, Holter and Cardiac Surgery, and communicates with other Hospital Information Systems (HIS), Picture Archiving Systems (PACS), and other devices through standard HL7 interfaces and DICOM standards. CCW does not contain controls for the direct operation of connected modalities.

CCW is intended for use by technical and medical professional users.

The CCW product is a standalone software solution intended to be installed on medical IT networks.

1.3 Equipment Symbols

	Consult accompanying documents.
	Consult instructions for use.
	CE marked per the Medical Device Regulation (EU) 2017/745 of the European Parliament and the Council.
	Authorized representative in the European Community.
	Manufacturer's identification.
	The number found under this symbol on the product label is the date of manufacture in the YYYY-MM format.
	Indicates this product is a medical device.

1.4 User Profiles and Use Environment

1.4.1 User Group 1: Operator

This group uses CCW predominately for:

- Input and aggregation of clinical data
- Analysis of clinical data
- Physician reporting
- Submitting data via an export to the Registry or Accreditation bodies

This group consists of:

- Professional Staff-Physicians: credentialed medical doctors (MD's)
- Ancillary Staff: credentialed in either Nursing (RN/LPN) or Technologists

1.4.2 User Group 2: Administrator

This group works predominately in the System Management area of CCW for:

- Maintaining the system (user rights, system configuration, troubleshooting)
- Ensuring it is in good working order
- Maintaining data lists and inventory
- Managing inventory
- Generating administrative and statistical reports

This group typically consists of Nurse (RN/LPN), Technologist (RT) or IT (healthcare or IT professional degree).

1.4.3 Intended Use Environment

Care Area where product will be used:

- Cath, EP, Echo, Nuclear Medicine Lab
- Outpatient Office
- Physician's Office (hospital and home)
- Radiology (MRI, CT, X-Ray, Ultrasound, Interventional)

1.5 License Agreements

The following third-party tools are used within the Centricity Cardio Workflow software:

- NetAdvantage for .NET, Copyright 2003-2007 Infragistics, Inc.
- Infragistics NetAdvantage for WPF, Copyright 2005-2010 Infragistics, Inc.
- Data Compression: zlib.h - interface of the "zlib" general purpose compression library, version 1.0.4, July 24th, 1996. Copyright 1995-1996 Jean-loup Gailly and Mark Adler
- ComponentOne C1 FlexGrid, Copyright ComponentOne LLC. All rights reserved.
- PPJ Framework 2.0, Copyright 2004-2008 Ice Tea Group, LLC
- TX Text Control .NET Document Server, Copyright The Imaging Source Europe
- SkinSoft VisualStyler.Net, Copyright 2008-2009
- Clinical Credits for Cardio Editor Schemas: Dr. med. Siegbert Haetinger, Klinikum Nürnberg, Germany
- PostSharp Express, Copyright PostSharp Technologies™
- Open Source Credits:
  - NHibernate – license file: http://www.gnu.org/licenses/lgpl.html
  - PDFBox.NET – license file: http://www.apache.org/licenses/LICENSE-2.0.txt
  - Json.net – license file: https://github.com/JamesNK/Newtonsoft.Json/blob/master/LICENSE.md

1.6 Product Lifetime

Customers are required to be on a commercially available release at all times. Failure to upgrade to an approved support version could result in additional support fees and adversely impacts GE Healthcare's ability to deliver the highest quality support.

1.7 Database Backup

CAUTION: It is very important to create backups of the CCW database and the Archive folder at least every night. For details, please contact your CCW administrator.

It is the customer's responsibility to maintain and verify the backup procedure on a regular basis.

2 General Functions

This section serves as a guide to general functions on the CCW application including how to launch the application, navigating the landing page, and viewing the various help options.

2.1 Launch Application

1. Double-click the *Cardio Workflow* icon on your desktop or launch the application from *Start Menu* > *All Programs* > *General Electric Company* > *Centricity* > *Cardio Workflow*.
2. When the *Login* dialog appears, enter a valid username and password in the appropriate fields.
3. From the *Client Type* drop-down menu, choose the workstation profile.
4. From the *Authentication Type* menu, choose the appropriate method of authentication, either *Credential Authentication* or *LDAP Credential Authentication*. The type of authentication is configured by your administrator.
5. Click *Log in*.

2.1.1 Option Keys Expiring

If *Expiring Option Keys* window pops up after logging in, it is a warning that the listed options will be expiring after the mentioned date. In this case, please contact your GE sales representative immediately.

2.1.2 Change Password

Users with the appropriate privileges can change their own password. This function is available during login.

1. Start Centricity Cardio Workflow.
2. On the login screen, click the *Change Password* button.
3. On the *Change Password* screen, enter user name, old and new password as required.
4. Click the *Change Password* button to activate the new password or click the *Close* button to return to the login screen without changing the password.

2.2 Landing Page

The landing page appears when the application starts after login. The landing page provides a single point of access to functions within CCW. Submenu options will vary depending on installed language version of CCW. Closing any screen within CCW will return you to the landing page. Several options on the landing page will be grayed out for user groups without system administrator privileges.

There are two possible configurations (configured by your system administrator) for the login buttons shown on the landing page and the main *Menu*:

- *Log in as another user* and *Exit* (see Log in As Another User/Exit)
- *Switch user*, *Log out* and *Exit* (see Switch User/Log Out/Exit)

2.2.1 Log in As Another User/Exit

The *Log in as another user* option allows you to log in as a new user without restarting the application. Since each user has unique rights to certain portions of the application, users must log in with their own login name and password to access these sections of the application.

1. From the landing page or from the main *Menu* within the CCW application, click *Log in as another user*.
2. When the *Login* screen appears, enter a new valid *User* and *Password* in the appropriate fields.
3. From the *Authentication Type* menu, choose the appropriate method of Authentication, either *Credential Authentication* or *LDAP Credential Authentication*.
4. Click *Accept* to log in or press *Cancel* to return to the previous screen with the initial user logged in.

The *Exit* option allows you to completely terminate the application session. Clicking the *X* on the landing page also allows you to completely terminate the application session. When prompted to confirm, click *Yes*.

2.2.2 Switch User/Log Out/Exit

The *Switch user* option allows you to log in as a new user without restarting the application. Since each user has unique rights to certain portions of the application, users must log in with their own login name and password to access these sections of the application.

1. From the landing page or from the main *Menu* within the CCW application, click *Switch user*.
2. When the *Login* screen appears, enter a new valid *User* and *Password* in the appropriate fields. Accessing the *Login* screen also logs the initial user out of the system. If you press *Cancel*, the program automatically closes and relaunches to show the initial *Login* dialog.
3. From the *Authentication Type* menu, choose the appropriate method of Authentication, either *Credential Authentication* or *LDAP Credential Authentication*.
4. Click *Accept*. You will be automatically redirected to the same exam as the previous user, with the previously active form opened and the report template selected. If you do not have access to the form, you will be redirected to the first form in the exam. If you do not have access to the exam mode, you will be redirected to the configured login screen.

The *Log out* option allows you to close the application and log in as a new user. Since each user has unique rights to certain portions of the application, users must log in with their own login name and password to access these sections of the application.

1. From the landing page, click *Log out*.
2. The program automatically closes and relaunches to show the initial *Login* dialog.

The *Exit* option allows you to completely terminate the application session. Clicking the *X* on the landing page also allows you to completely terminate the application session. When prompted to confirm, click *Yes*.

2.3 Help Options

This user manual can be accessed by selecting *Help* > *Help* from the landing page or selecting *Menu* > *Help* > *Help* from within the CCW application.

You can also retrieve information on your current CCW software, such as software version or customer service contact information.

1. Select *Help* > *About* from the landing page or select *Menu* > *Help* > *About*.
2. To close the software information window, click *OK* or the *Exit* button.

3 Screen Elements

This section describes how to use common elements that are found in several screens within CCW including ribbon bars, data fields, data fields with catalogs, and tables.

3.1 Ribbon Bar

At the top of each screen, there is a ribbon bar with menus and tools for quick access.

To determine what each tool does, roll your mouse over the tool icon. A tooltip window appears, either giving the function name or describing the function associated with the tool.

When you click a menu or a tool in the ribbon, either a submenu appears, or the required function is executed immediately.

You might find it convenient to access the menus by keyboard shortcuts rather than pointing and clicking with your mouse.

1. Press **F10** to display shortcut letters next to the menu names.
2. Press the shortcut letter to access the respective menu.

3.2 Data Fields and Checkboxes

3.2.1 Simple Data Fields

Simple data fields allow you to type text directly into the field, e.g. the *Name* field on the *Patient Information* screen.

3.2.2 Text Fields

Any free text can be entered in text fields. The maximum text length is hard-coded for every text field.

The contents of text fields can never be evaluated in statistics or queries. If you need statistical evaluations or queries of data, always use data fields that are based on catalogs (combo boxes or multi-select fields), numeric data fields, checkboxes or date/time fields.

3.2.3 Numeric Data Fields

Numeric data fields are a special category of simple data fields on the main exam screen and all detailed exam screens. You can type numbers directly into the data field, or edit existing numbers, and also view a history of data from this field by right-clicking.

3.2.4 Composite Fields

Composite fields are used as a container for multiple child fields. Right-clicking a composite field label or the code of the currently selected child field displayed to the right of the composite field opens a context menu listing all the available child fields that can be used for that composite field.

3.2.5 Checkboxes

A checkbox is a small square box with a short description next to it. The checkbox is activated (check mark) or deactivated (no check mark) by clicking the box or the attached description.

3.2.6 Calendar Icon

A calendar icon next to a date input field allows you to select a date from a calendar display by clicking on the desired date.

3.3 Data Fields with Catalogs

In the daily routine of recording medical data, there are many inputs selected from groups of options that remain unchanged or need only occasional updates. Therefore, for many input fields, CCW allows items to be selected from catalogs. This allows data to be selected rather than typed and it allows you to adapt the catalog to your requirements. The use of catalogs allows quick recording of data, prevents misspellings, and guarantees consistency of data and reliable statistical evaluation.

The CCW screens require the input of catalog codes, which are also displayed. A catalog code consists of a sequence of up to eight characters (codes must be unique within a catalog) and has a text of up to 254 characters attached to it. The text of a catalog entry is not permanently displayed on the screen but appears as a tooltip when you place the mouse cursor on the item.

The combination of code and text allows quick selection of the code while the text is used to provide additional information and print full explanations in reports and memos.

There are two different types of data fields that are supported by catalogs.

3.3.1 Single-Select Fields – Combo Boxes

Click the down arrow next to the combo box to display the list of available options. You can either select one option or type a catalog code in the field. If the catalog code exists, the system will find the match and accept the code.

If you type a string into the combo box that does not exist in the catalog, your input will appear in italics and will not be saved.

The type ahead feature implemented in the combo boxes supports the incremental search functionality and speeds up locating the catalog entry. As you begin typing, the catalog list gets filtered with the characters you have entered, showing you matches.

You can use the up and down arrows on the keyboard to scroll through the list in a combo box. When recording data using combo boxes, you can display and edit the attached catalogs, if necessary.

1. Double-click the down arrow to the right of the text box with the right mouse button to display the attached catalog.
2. Click the *Insert Row* icon.
3. Enter the respective data; depending on the configuration of the respective catalog, an input mask will be displayed.
4. If you want to delete items from the catalog, mark the item in question and click the *Delete Row* icon.

5. Click the *Save* icon to save your inputs; otherwise you will be asked whether your inputs should be saved when you close the catalog window.

If you add items that contain leading or trailing blanks, they are removed when the catalog is saved. Also, if you add an item that has multiple blanks, the blanks are reduced to one blank when the catalog is saved. New entries will be inserted in alphabetical order automatically.

3.3.2 Multi-Select Fields (MSFs)

The multi-select field allows multiple catalog entries in one data field.

1. Click the down arrow next to a multi-select field to open the catalog.
2. Click all desired rows in the catalog table to add the respective entries to the field.

   As an alternative, type the code in the MSF; CCW will try to match your inputs.
3. When you are done, click somewhere outside the catalog table to close it.
4. To delete an entry from a MSF, simply mark it, and then delete using the **Del** key.
5. To display the full text associated with the code in the field, place the mouse cursor on the code.

3.3.3 Multi-Lined Report Descriptions

In the catalog entry's description, the double-pipe (||) can be used to create a line feed in the report. Line feeds are also displayed if you press and hold the right mouse button on a catalog entry in the UI and in the MSF catalog viewer.

3.3.4 Hierarchical Catalogs

When you select the down arrow next to a combo box in a hierarchical catalog, the associated catalog page appears.

In a hierarchical catalog, the catalog entries are ordered in a parent/child structure. Parents are displayed with an icon and cannot be selected. They only serve for structuring. Child items are displayed in green and can be selected. Navigate to the child items by expanding/collapsing the parents using the "+"/"-" signs.

To select a catalog entry, either double-click it or highlight it in the table and click on the *Accept* button in the toolbar.

3.4 Tables

A table can hold multiple data records in the form of rows.

Click the *Add* button to create an empty row. You can then enter data in each column of the row by selecting the column. Some columns have combo box functionality, allowing you to select an appropriate option for that column.

Click the *Delete* button to mark the selected row for deletion; the row is deleted when the screen is saved.

3.4.1 Tables with Dependent Data Fields

Tables with dependent data fields allow you to enter the data into input fields on the bottom of the screen. These inputs are then displayed in a row format on the top of the screen.

Click the *Add* button to create a new row. Then enter the necessary data in the input fields on the bottom half of the screen. As the information is entered in the input fields, the columns in the row above are populated automatically. This format allows you to review records easily in the row format, while the entire data record is shown in the input fields.

Click the *Delete* button to delete a selected row.

3.4.2 Sorting Tables

Many tables in CCW can be sorted by clicking the column header of the column that you want to sort by. The first click sorts in ascending order (up arrow icon), the second click sorts in descending order (down arrow icon). Clicking the space left of the leftmost column header returns to initial sorting order.

Exceptions are tables that present data in a hierarchical structure or where you can change the position of data in rows by moving them up or down. In some cases, it is impractical to sort a table by certain columns. These columns will not sort data after clicking the column header.

3.4.3 Tree Diagrams

Tree diagrams in the left-hand pane integrate the group names, such as article categories, vendor names or manufacturers. You can collapse the tree structure by clicking the - (minus) icon and expand the tree structure by clicking the + (plus) icon.

Your choice of a group in the tree diagram determines the content of the table to the right.

Your choice of an item in the table determines the content of the list below.

3.4.4 Specifying Filter Criteria

The row below the column headers allows you to specify filter criteria for searching the respective lists.

Clicking the square icon left of the leftmost column header clears ALL filter criteria.

Clicking the button to the right of the square icon opens a drop-down menu where you can choose an operand for your search. After selection of the operand, the cursor starts blinking in the field next to it and you can enter the search criterion in this field.

The next drop-down arrow further to the right opens a list box with additional filter criteria. If you choose *Custom*, the ensuing window allows you to define your own filter rules for the column in which you are currently working.

The button to the right of the drop-down arrow clears the filter criteria for the column in which you are currently working.

To change the width of a column:

1. Place the mouse pointer on the line between two columns; the pointer will change to a double-headed arrow.
2. Click and drag the double-headed arrow to the right to widen the column or to the left to make it narrower.

When you have configured a table layout, right-click in the column and select *Save* to save the table settings with a code and name.

From the same menu, you can...

- Load table settings
- Delete table settings
- Remove all filters
- Print the view (or a custom format configured in the print menu)
- Refresh the view

4 Patient Information Screen

This section describes elements of the *Patient Information* screen and provides steps on how to create and edit patient data, merge patient data, and add attachments.

4.1 Patient Information Ribbon Bar

The *Patient Information* ribbon bar allows you to use buttons to access frequently used functions.

When you initially open CCW, the application is in query mode, i.e. no patient is selected. It remains in query mode until you create or load a patient into *Patient Information*. Some buttons remain grayed out until a patient is selected.

- ***New Button*** - The *New* button opens a new and empty patient *Details* form but does not delete the current patient. Make the appropriate inputs and click the *Accept* button in the lower right corner to save the entries and close the form; the patient will appear on the *Patient Information* screen. If you want to exit the screen without saving the changes, click the *Cancel* button.
- ***Edit Button*** - The *Edit* button opens the patient's demographic data form. Make the appropriate inputs or changes and click the *Accept* button in the lower right corner to save the entries and close the form; the patient will appear in the *Patient Information* screen. If you want to exit the patient's demographic data form without saving the changes, click the *Cancel* button.
- ***Delete Button*** - The *Delete* button irretrievably deletes the current patient. However, for reasons of data security, you can delete a patient, including any requests associated to that patient, using the *Delete* button only after deleting all associated exams and admissions.

  If you are not able to delete a patient although you have deleted all associated exams and admissions, check if there are still requests that are converted to exams and thus are not displayed in the exam log. Create a new request without saving, then click the button *Load All* and step through the existing requests using the arrow buttons and delete them individually.
- ***Quick Search*** - See Searching for Patients.

4.2 Searching for Patients

After starting the program, the *Quick Search* box on the left side of the screen is open by default. You can hide or open it by clicking *Quick Search*. You can locate patients in the database via the *Quick Search* box in one of two ways:

- In the *Quick Search* box, leave all the fields empty and either press **Enter** or click the *Search* button to display a list of all patients in the database.

  Or
- Enter search criteria in at least one of the following fields to filter the list and reduce the number of displayed entries:
  - Patient number
  - Last Name

- First Name
- Date of Birth
- Exam Performed Date
- Exam Planned Date
- Exam Mode
- Admission No.
- Exam No.

Enter search criteria such as a last name in the appropriate field and either press **Enter** or click the *Search* button at the bottom of the *Quick Search* box. If there are no matches to your criteria, a message will be displayed. If there is exactly one match, the patient in question will appear in the *Patient Information* screen. If there are several matches, a list of patients will be displayed for selection of the appropriate patient.

- You can use the percent symbol (%) or asterisk (*) characters as wildcards to replace more than one character (for example, **Wa%ter** will match Water and Walter). If you want to search for all items that begin with certain characters, such as Wa, just enter **Wa**; the system automatically appends the % character and searches for all matches that begin with Wa. You can also use the underscore character (_) or question mark (?) as a wildcard to replace a single character.
- Performing a search without any criteria specified will list all patients in the database.
- The patient name and first name search are not case sensitive. For example, if you enter either **Doe** or **doe**, the patient John Doe will appear for either search.
- Patient number, admission and exam searches ARE case sensitive.
- Only the patient number must be unique for each patient. The first and last name and the date of birth can be the same as another patient, as long as the patient number for each patient is different.

WARNING: After the patient list is displayed, select the appropriate patient and confirm that it is the correct record by verifying the patient demographic data.

4.3 Create a New Patient

1. On the *Patient Information* screen, click the *New* icon.
2. An empty patient *Details* form will open, and you can begin entering the new patient's demographic information.

See Patient Data and Details Form for more information on how to enter this information.

4.4 Merging Patients

The *Manage Patient* screen allows you to merge two patient records so that only one patient record exists for a single patient. Most often, this function is used when a patient was entered twice; for example, the name was misspelled during one admission and when the patient record could not be located under the misspelled name, a second patient record was created.

Other times this function is used is when an emergency exam was performed with a fictional patient name, such as John Doe. When the patient's real name can be established, or the information is obtained from the hospital information system, the patient record can be merged with the actual patient record.

1. Access the worklist (see Access the Worklist Screen), right-click on the patient with the conflict and select *Merge patient*.
2. When the *Patient Merge* window appears:
    - The upper window will display the demographic information of the source patient with conflict(s) who was selected from the worklist.
    - The middle window will display a list of proposed destination patient(s) that the source patient should be merged into based on demographic criteria.
3. If the correct destination patient is not displayed, open the *Quick Search* window and manually search for the correct destination patient.
4. Once the correct destination patient is highlighted, select the *Merge source patient into destination patient* button. All data related to the source patient is assigned to the destination patient and added to the data currently existing for the destination patient. The source patient will be deleted from the database.

4.5 Patient Data and Details Form

In the patient's *Details* form, you enter the patient demographic data. When a new patient is created, the patient's *Details* form is displayed automatically. To make changes to an existing patient's data, first choose the patient in question and then click the *Edit* button.

Depending on the geographic location of the CCW installation, not all tabs described in this manual may be available.

The following fields comprise the patient demographic data. While the mandatory fields are noted below, it is recommended that you enter all the patient data.

- ***Pat. No.*** (Patient Number) - CCW automatically creates the patient number; however, you can enter this number manually. If you enter it manually, CCW checks to determine if the number already exists. If yes, you will be unable to save the record and you will need to enter a new patient number. Only the patient number must be unique for each patient. The first and last name and the date of birth can be the same as another patient, as long as the patient number for each patient is unique.
- ***NHS No.*** (NHS Number - UK specific) - Enter the National Health System number, if applicable.
- ***SSN No.*** (SSN Number- US specific) - Enter the Social Security Number, if applicable.

- ***Last Name*** - Enter the last name of the patient. This field is mandatory. The name fields on the *Patient Information* screen are case sensitive. For example, if you enter a patient as **John doe**, the record is saved as John doe, exactly as entered.
- ***First Name*** - Enter the first name of the patient. This field is mandatory. The name fields on the *Patient Information* screen are case sensitive. For example, if you enter a patient as **John doe**, the record is saved as John doe, exactly as entered.
- ***Middle Name*** - Enter the middle name of the patient. This field is optional.
- ***DOB*** - Enter the patient's birth date in the correct format based on the installed language version of CCW. This field is mandatory.
- ***Birth Gender*** - Select the appropriate option for the patient. This field is mandatory.
- ***Administrative Gender*** - Select the appropriate option for the patient. This field is optional.

There are four additional data fields in the form. These data fields can be used to store two sets of additional name and first name (i.e. in a different character set). These fields can also be used for searching a patient; the use of wildcards is possible (* or ?). However, a search with either of these new fields is case sensitive!

In the *Patient Details* pane, the following fields appear:

- ***Maiden Name*** - Enter the patient's maiden name, if applicable.
- ***Title*** - Select a title from the combo box, if applicable.
- ***Alias*** - Enter the alias name of the patient, if applicable.
- ***Occupation*** - Enter the patient's occupation.
- ***G.P.*** - Enter the name of the patient's general practitioner.
- ***Native Town*** - Enter the patient's town of birth.
- ***Nationality*** - Select the patient's nationality from the combo box.
- ***Race*** - Select the patient's race from the combo box.
- ***Ethnic*** - Select the code for the applicable ethnic origin from the combo box.
- ***Address 1/Address 2*** - Enter the street address for the patient.
- ***City*** - Enter the city for the patient.
- ***State*** - Select the state for the patient, where applicable.
- ***Zip Code*** - Select the postal code for the patient city.
- ***Country*** - Select the country for the patient.
- ***County*** - Select the county for the patient.
- ***Phone*** - Enter the home telephone number for the patient.
- ***Workphone*** - Enter the work telephone number for the patient.
- ***Cellphone*** - Enter the mobile telephone number for the patient, if applicable.
- ***Email*** - Enter the patient's email address, if applicable.
- ***Emergency Contact*** - Enter the emergency contact information for the specific patient.
- ***Responsible Party*** - Enter applicable information, e.g. the guardian for the specific patient.
- ***Deceased*** - Enter date-of-death directly into the data field or use the icon next to it and select a date from the calendar.

The date entered is validated that an examination date does not occur after the date of death and the admission date is before the date of death. If an error is recognized, you are notified by a message.

The text data field next to the date of death field can be used to store any information about the death of patient (reason, source of info, procedures, etc.).

Click *Accept* when all information is entered.

4.5.1 Exam Log Tab

The *Exam Log* tab displays all existing admissions, discharges, exams, and requests that pertain to this patient. To refresh the list at any time, click the *Refresh* button on the right-hand side.

For your convenience, there are two types of views available for entries. Below the *Refresh* button, you can find the *Switch to Table View* and *Switch to Tree View* buttons. Use the buttons to choose your preferred view.

Double-click on any row in the table to display the corresponding admission, exam or request screen. The *Request*, *Discharge*, *Admission* and *Exam* icons let you easily locate the desired row.

Clicking the *Delete* button in the last column instantly deletes the corresponding exam, request and admission. Deleting an exam will delete all findings and reports associated to it.

If multiple examinations were selected on the *Exam Data* screen in the multi-select *Examination* field, all the selected examinations will appear in the *Comment* column, allowing you to more easily select the correct exam.

You can also sort the *Exam Log* section by clicking on any column header. The table is sorted based on the information in that column. For example, if you click the *Mode* column, the column is sorted alphabetically by exam mode abbreviations. To return to the default sorting, click the top left corner of the section.

4.5.2 Details Tab

The *Details* tab displays the patient's demographic data. To edit the data, click the *Edit* button in the ribbon bar.

In the lower part of the *Details* screen you can save comments about the patient that are not related to an admission or exam. If you want to edit an entry, mark the entry in question and click the *Edit* icon. To delete an entry, mark the entry in question and click the *Delete* icon. To refresh the list, click the *Refresh* icon.

This screen is intended for non-crucial comments only. Since any entered information is free text, it cannot be evaluated. Therefore, if there is any crucial information that must be statistically evaluated, it should go into data fields and tables on other screens.

4.5.3 History Tab

The *History* tab allows you to enter and view historical data of the patient.

To view a clinical history entry, position the cursor on an entry; the entry will be displayed.

Click the *Add* button to create a new entry. Fill in the following fields:

- ***Date*** - Enter the date of the event you want to describe.
- ***Angina*** - Use the combo box to select the appropriate entry.
- ***Dyspnea*** - Use the combo box to select the appropriate entry.
- ***Arrhythmia*** - Use the combo box to select the appropriate entry.
- ***Comment*** - Enter a brief comment.

You can copy and edit data from an exam by clicking *Copy&Edit From Exam* above the entry list.

You can copy and edit a previous history by clicking *Copy&Edit Previous* above the entry list.

Click the *Accept* button to save the entry or click *Cancel* to close the window without saving.

To edit a clinical history entry, mark the entry in question and click the *Edit* icon.

To delete a clinical history entry, mark the entry in question and click the *Delete* icon.

To refresh the list, click the *Refresh* icon.

4.5.4 Allergy Tab

WARNING: For patient safety, you are responsible for correctly entering allergy information. If this information is wrong or missing, life-threatening situations may occur.

The *Allergy* tab allows you to view and enter patient allergies. The screen consists of two areas. The entries are listed on the left. Clicking an entry displays the allergy details on the right.

To view an allergy entry, position the cursor on an entry; the entry will be displayed.

Click the *Add* button to create a new entry.

You can copy and edit data from an exam marked under the *Exam Log* tab by clicking *Copy&Edit From Exam* above the entry list.

You can copy and edit a previous entry by clicking *Copy&Edit Previous* above the entry list.

Click the *Accept* button to save the entry or click *Cancel* to close the window without saving the entry.

To edit an entry, mark the entry in question and click the *Edit* icon.

To delete an entry, mark the entry in question and click the *Delete* icon.

To refresh the list, click the *Refresh* icon.

4.5.5 Infection Tab

The *Infection* tab allows you to quickly record any infections present in the patient prior to, during, and after the exam.

You can copy and edit data from an exam marked under the *Exam Log* tab by clicking *Copy&Edit From Exam* above the entry list.

You can copy and edit a previous entry by clicking *Copy&Edit Previous* above the entry list.

Click the *Accept* button to save the entry or click *Cancel* to close the window without saving the entry.

To edit an entry, mark the entry in question and click the *Edit* icon.

To delete an entry, mark the entry in question and click the *Delete* icon.

To refresh the list, click the *Refresh* icon.

4.5.6 Laboratory Tab

The left side of the *Laboratory* tab allows you to record data for *Date and Time*, *Recorded* (how information is captured), and *Comment*. When a HIS system is connected, the data may be automatically imported from the Lab Interface.

You can copy and edit data from an exam marked under the *Exam Log* tab by clicking *Copy&Edit From Exam* above the entry list.

You can copy and edit a previous entry by clicking *Copy&Edit Previous* above the entry list.

Click the *Accept* button to save the entry or click *Cancel* to close the window without saving the entry.

To edit an entry, mark the entry in question and click the *Edit* icon.

To delete an entry, mark the entry in question and click the *Delete* icon.

To refresh the list, click the *Refresh* icon.

4.5.7 Medication Tab

The *Medication* tab allows you to enter patient medications.

You can copy and edit data from an exam marked under the *Exam Log* tab by clicking *Copy&Edit From Exam* above the entry list.

You can copy and edit a previous entry by clicking *Copy&Edit Previous* above the entry list.

Click the *Accept* button to save the entry or click *Cancel* to close the window without saving the entry.

To edit an entry, mark the entry in question and click the *Edit* icon.

To delete an entry, mark the entry in question and click the *Delete* icon.

To refresh the list, click the *Refresh* icon.

4.5.8 Phone Log Tab

The *Phone Log* tab displays a log of consultation calls for this patient.

Click the *Add* button to create a new log. Then fill in the following fields:

- ***Date*** - The date the call took place.
- ***Category*** - Use the combo box to select the appropriate call category.
- ***Caller*** - Enter the caller's name.
- ***Received by*** - Enter the name of the person who received the call.
- ***Summary*** - Enter a brief summary of what was discussed during this telephone call.

Click the *Accept* button to save the phone log or click *Cancel* to close the window without saving the log.

To edit a phone log entry, mark the log in question and click the *Edit* icon.

To delete a phone log entry, mark the log in question and click the *Delete* icon.

To refresh the list of phone logs, click the *Refresh* icon.

4.5.9 Risk Factor Tab

You can add, remove, copy, and populate this exam by copying all the risk factors from the latest exam.

You can copy and edit data from an exam marked under the *Exam Log* tab by clicking *Copy&Edit From Exam* above the entry list.

You can copy and edit a previous entry by clicking *Copy&Edit Previous* above the entry list.

To edit an entry, mark the entry in question and click the *Edit* icon. In the *Risk Factors* window, you can select various risk factors from the respective drop-down menus as they relate to the current patient for the current exam.

To delete an entry, mark the entry in question and click the *Delete* icon.

To refresh the list, click the *Refresh* icon.

4.5.10 Observations Tab

The *Observations* tab allows you to quickly record your clinical observations on the patient at the time of the exam, as well as any comments.

You can copy and edit data from an exam marked under the *Exam Log* tab by clicking *Copy&Edit From Exam* above the entry list.

You can copy and edit a previous entry by clicking *Copy&Edit Previous* above the entry list.

To edit an entry, mark the entry in question and click the *Edit* icon. In the *Risk Factors* window, you can select various risk factors from the respective drop-down menus as they relate to the current patient for the current exam.

To delete an entry, mark the entry in question and click the *Delete* icon.

To refresh the list, click the *Refresh* icon.

4.6 Devices/Leads

Click the *Devices/Leads* button from the *Patient Information* screen to display the *Manage Devices/Leads* dialog for this patient. The button will only be visible if the patient has devices/leads.

In the *Devices* or *Leads* tab, click on any row to display and edit the details of a device or lead.

To add a device or lead, click the *Add* button to create a new row, enter the details of the new device or lead, and click *Accept*.

The *MR Compatibility* tab provides MR compatibility related information from existing (not explanted) devices and leads.

4.7 Attachments Screen

Click the *Attachments* button from the *Patient Information* screen to display the *Patient Attachments* window for this patient. A list of all current attachments appears. The *Patient Attachments* window allows you to add non-CCW files to the patient record. These files can be file types as images, videos, or documents.

Double-click on any row to display the attachment, or highlight an attachment and click the *Edit* button to display the attachment.

To add attachments:

1. On the *Patient Attachments* window, click the *Add* button to create a new attachment row.
2. Locate and select the desired attachment file.
3. In the *New Attachment* window, use the *Document Type* combo box to select whether this file is a picture or text.
4. Use the *Comment* text box to add any additional comments about the attachment, if necessary. This field is free text and will not be included in any statistical evaluation.
5. Click the *Accept* button to add the attachment to the patient record.
6. When the *Patient Attachments* window appears, confirm that a row appears in the log for the newly-created attachment.
7. Click the *Close* button to close the screen.

If the system is enabled to accept attachments, it is possible to automate the attachment function electronically from other systems. Please consult with your service representative if you want this functionality.

4.8 Report Overview Dialog

The *Report Overview* dialog allows you to view all reports for a patient in a single location.

You can only view existing reports in read-only mode from the screen.

1. Click the *All Studies* button to display the *Report Overview* dialog.
2. Double-click any desired report row to view the report.

4.9 Web Screen

The *Web* button on the *Patient Information* screen allows you to launch the web interface, displaying the information for the patient currently selected on the *Patient Information* screen. Depending on the site configuration, the following Web Interfaces may be available:

- Centricity Enterprise Web
- Centricity CW Web (Xi)
- Centricity CW Web (Muse)
- Centricity CW Web (IMS)
- CardioSoft Web
- GE Healthcare

1. Locate the desired patient and have that patient's information displayed on the *Patient Information* screen.
2. Click the *Web* button.

3. When the pop-up box appears, select one of the available web options, such as MuseWeb or CardioSoftWeb.
4. The web interface appears, with the current patient's information displayed.
5. Since the web interface opens in a separate window, it may be positioned and resized as needed.
6. Close the web interface window when you are done.

4.10 Organization Link

Click the *Organization Link* button to link the patient currently selected on the *Patient Information* screen to relevant organizations and view the history of organization links to each admission, exam and request for the current patient.

4.11 CRM Import

The *CRM Import* button on the *Patient Information* screen allows you to import data from a CRM device to CCW:

1. Copy CRM data from a programmer device (acquisition station) to a USB storage device.
2. Connect the USB storage device to the CCW Client PC. This step can also be performed after opening the *CRM Import* window.
3. In CCW, select the appropriate Organization and click the *CRM Import* ribbon item in the *Patient Information* screen.

   The *CRM Import* window will open and automatically display patient data found on the USB.

   - ***Unprocessed Only*** - Select this checkbox to show the list of unprocessed records. When this checkbox is unchecked, it is possible to select a file that was already transferred and send it to CCW again.
   - ***Select All*** - Click this button to select all patients in *CRM Import* window.
   - ***Files*** - Displays the total number of files present in the import location.
   - ***Deselect All*** - Click this button to deselect all patients in *CRM Import* window.
   - ***Delete Selected Files*** - Click this button to delete selected files.
   - ***Send to CCW*** - Click this button to send the data from selected patients across the interface to CCW.
   - ***Select Import Folder*** - If the data is stored on a different location, e.g. on the client PC rather than a USB storage device, click *Select Import Folder* and browse to the alternative folder location and click *OK*.

4. If patient information is missing (missing fields displayed in orange in the *CRM Import* window), enter the missing info before sending out the results to CCW. To enter missing info for a patient, right-click on the selected patient and click *Change Patient Information*. In the *Patient* window, enter the missing data and click *Accept*.
5. In the *CRM Import* window, select the patients and click *Send to CCW*. CCW looks for a CRM exam of the same type (implant or follow-up) with the same date as the import data date:

- If patient is identified and an exam is found, the data is imported.
- If patient is not identified or no exam is found, the data goes into the *CRM Unresolved Imports* admin tool. Please contact your system administrator for importing this data manually.

5 Workflow Overview

This section describes a common workflow when using CCW from a patient's initial admission to the hospital through to discharge when he or she leaves the hospital.

5.1 Standard Workflow

5.1.1 The Admission

The admission initiates the patient's stay in the hospital. On the *Admission* screen, you enter the admission date, as well as the initial diagnosis and planned exams. Any number of admissions and discharges can be assigned to the patient.

If Centricity Cardio Workflow communicates with a Hospital Information System (HIS), the demographic data and admission data may be obtained from the HIS. Admission and Discharge data are also referred to as case data.

You need to use the addressee fields of the admission if you want to use the addressee functions in the report editor.

5.1.2 The Examination

After the patient is admitted, an examination can be created. Although your facility may not utilize admission workflow, there will always be an admission to which examinations are associated. See diagram below.

An exception is made if an Emergency exam is created when admission information is not available. Upon initiating an exam, click the *Unlinked Examination* button to create the examination without an admission.

The exam initiates the clinical examination. On the *Exam* screen, you will select the examination mode and other relevant examination information. Any number of examinations can be created beneath a single admission.

5.1.3 The Examination Transfer

Depending on your implementation, some Centricity clients may be configured with a transfer function. If evoked, you are able to pass critical examination information, such as patient demographics, to other laboratory devices electronically.

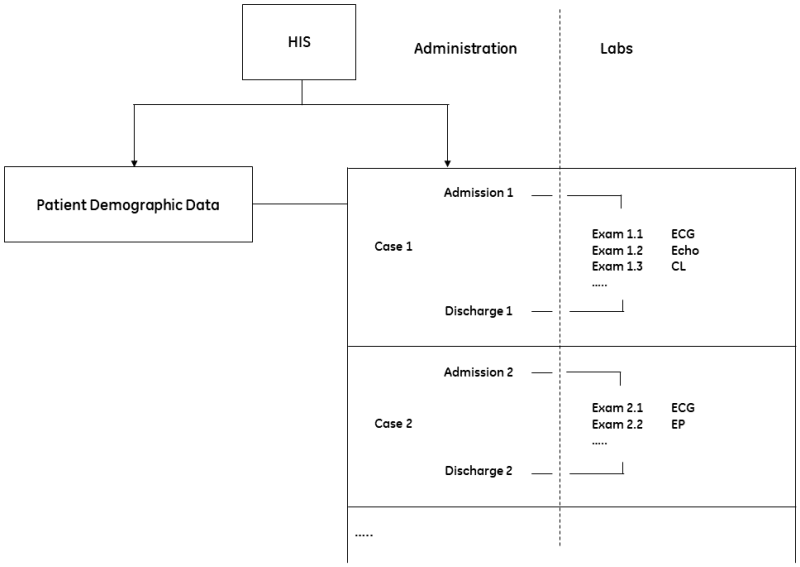
5.1.4 Detailed Examination Forms

The detailed exam forms that are linked to the exam modes and accessed via the related main exam forms represent the clinical content that is available and that is characteristic of the exam mode.

5.1.5 Discharge

Following all examinations, an admission may be moved into a discharge state; a patient is discharged when he or she leaves the hospital. Again, this can be automated with a Hospital Information System communication. No discharge is required for outpatient admissions.

The following illustration shows the basic workflow.



5.2 Request Workflow (Optional)

The optional request workflow can be used in combination with or instead of the standard workflow.

A request generates a request for a clinical examination. On the *Request* screen, enter the type of examination (exam mode), initial diagnosis, indications, etc. The request may then be scheduled using the exam scheduler.

Once the patient admission is created, the request can be converted into an examination by clicking the *Convert Request to Exam* button; this effectively closes the request.

Requests can be generated by one staff member, and then processed later by another staff member, including the handling of the admission and exam date.

Even if you are not using the scheduler, you must create requests if you want to have full DICOM modality worklists (Full DICOM MWL).

Request is also used as a synonym for order. If connected with a Hospital Information System (HIS), the requests may come from the HIS.

5.3 User Preferences

Only users with Administrator rights can configure individual user preferences. Contact your administrator if you would like to enable/disable user preferences.

User preferences are intended to streamline the reporting process. User preference options include:

- ***Return to Worklist After Signing*** - When enabled, this setting will return you to the worklist after signing a report, instead of returning you to the patient list.
- ***User Login Screen*** - When you log in, you will be automatically directed to one of the

following screens (depending on your access rights):

- Main Screen (the default landing page (see Landing Page))
- Patient Management
- Worklist
- Inventory Management

6 Request Screen

This section describes how to navigate the *Request* screen including how to create new requests, convert requests to exams, and create and edit memos.

6.1 Access Existing Requests

You can access the *Request* screen to view and edit existing requests from the *Patient Information* screen, from the *Request* menu in the main menu bar, or from the *Scheduler* screen.

From the Patient Information screen

1. Select the *Exam Log* tab.
2. Double-click an existing request on the *Exam Log* if you want to display and edit that request.

From the Request menu in the main menu bar

If a request has already been opened for this patient and not been closed again, this request can be quickly accessed by clicking *Request* in the menu bar when working in other screens.

From the Scheduler screen

Double-click an existing entry in the *Scheduler* screen and select *Request* to display the request.

6.2 Create a New Request

The *Request* screen allows you to create requests for the different exam modes.

Requests can be recorded independently of admission and exam dates. A request includes the date and/or documentation of a future exam. Requests are attached to a patient and are seen on the *Patient Information* screen on the *Exam Log* tab.

A request is created from the *Patient Information* screen in situations where the persons/institutions who initiate the request are not responsible for scheduling the exam. However, if the person who records the request is also in charge of scheduling, the request can subsequently be processed within the scheduler, e.g. in the scheduler's lab view by a person who is responsible for the schedule of a certain lab. See Scheduler for more information about the Scheduler.

1. On the *Patient Information* screen, click the *Request* button in the ribbon bar to create a request in the exam mode currently indicated below the button (the exam mode indicated is either predefined in the user profile, or it is the last exam mode used during the session) or click the arrow below the button to display a list of exam modes and choose the exam mode.

   As an alternative, click *New request* in the *Scheduler* screen. Whether you want to create a request from the *Patient Information* screen, or the *Scheduler* screen depends on your preferred workflow.
2. Enter the following information for an exam request. The following information is generally entered by the persons/institutions initiating the request.

- ***Urgency***
- ***Requested by*** - Use the combo box to select the person/institution that sends/initiates the request. This is not the person who schedules the exam.
- ***Exam Mode*** - The Exam mode is chosen while creating a new request; the chosen type is indicated here but cannot be changed.
- ***Type of Referral*** - Use the combo box to select if this is an inpatient or outpatient request.
- ***Transport*** - Use the combo box to select the type of transport required for the patient, such as ambulance, normal, etc.
- ***Diagnosis/Indication/Examination Tab:***
    - ***Indication*** - Click the down arrow to display the *Indication* catalog screen. From this screen, click as many applicable indications as necessary. The indications appear in the *Indication* field. You can also type in the field to display a list of indications matching your inputs. To delete an entry, mark the entry in question and delete it by pressing **Del** or the **Backspace** key.
    - ***Initial Diagnosis*** - Click the down arrow to display the *Diagnosis* catalog screen. From this screen, click as many applicable diagnoses as necessary. The diagnoses appear in the *Initial Diagnosis* field. You can also type in the field to display a list of diagnoses matching your inputs. To delete an entry, mark the entry in question and delete it by pressing **Del** or the **Backspace** key.
    - ***Examination*** - Click the down arrow to display the *Examination* catalog screen. From this screen, click as many applicable examinations as necessary. In the *Examination* field. You can also type in the field to display a list of examinations matching your inputs. To delete an entry, mark the entry in question and delete it by pressing **Del** or the **Backspace** key.
    - ***Comment*** - Enter any additional comments in this text box, if necessary. Any information entered in this field will not be included in statistical analysis.
- ***ICD Diagnosis Tab:***
    - ***ICD9 Primary Diagnosis*** - Select an ICD9 primary diagnosis from the drop-down list.
    - ***ICD9 Secondary Diagnosis*** - Select one or more ICD9 secondary diagnoses from the drop-down list.

      These entries do not carry over to the findings form within the exam modes.
    - The *ICD10 Primary Diagnosis* field is read-only.

3. Enter the following information. The following information is generally entered by the person responsible for scheduling the request.
    - ***Appointment for Admission/Date*** - Enter the desired date for the requested admission.
    - ***Appointment for Admission/Scheduled Time*** - Enter the desired time for the requested admission.

- ***Patient/Height and Weight*** - Enter the patient's height and weight.
- ***Examination Date/Date*** - Enter the date the examination should take place. The planned exam date is the most important information for scheduling and can also be filled/changed by dragging & dropping the request within the Scheduler (recommended). Request without a start date are displayed in the *Unscheduled Requests* list of the Scheduler (see No-date-yet Requests).
- ***Examination Date/Time*** - Enter the requested time for the exam.
- ***Examination Date/Room*** - Use the combo box to select the room where the exam should take place.
- ***Examination Date/Probable Duration*** - Enter the time (in minutes) for the exam length.
- ***Examination Date/Device Group*** - Use the combo box to select the device group needed for the exam.
- ***Staff*** - Using the + (plus button), enter the staff.

4. Click the *Save* button in the ribbon bar to save the request.
5. Then click the *Patient* button to return to the *Patient Information* screen, or, if you are the person responsible for scheduling the request, click the *Schedule* button. The *Scheduler* screen then appears. See *Schedule Requests* for more information.

6.2.1 Save Request

Click the *Save* button in the ribbon bar of the *Request* screen to save the request.

6.2.2 Refresh Request

To return to the last saved version of the request, click the *Refresh* button in the ribbon bar of the *Request* screen; all unsaved changes will be discarded.

6.2.3 Reset to Default Values

To reset the request form to the respective default values, click the *Default* button in the ribbon bar of the *Request* screen.

The default values can be altered by the administrator.

6.3 Convert Request to Exam

When a planned exam (request) is about to be performed, you can convert the request to an exam. To convert a request to an exam:

- Click the *Convert* button in the ribbon bar of the *Request* screen. The *Request* screen closes, the *Exam* screen appears, and the *Create Exam* dialog opens (see Create a New Exam).

If you exit the *Exam* screen without saving it first, the conversion is rejected, and the request remains active. Once a request is converted to an exam and saved, it is not possible to reverse the process.

When using the scheduling workflow, convert the request into an exam rather than create a new exam in the patient screen. Otherwise the requests you started will remain open and affect the list of open requests in the scheduler, making effective scheduling impossible.

6.4 Mark a Requested Examination as Performed

To mark a requested examination as performed, click the *Performed* button in the ribbon bar of the *Request* screen.

6.5 Create and Edit Memos

You can create, edit and print memos. Memos are text documents that are opened and can be edited in the CCW text editor. They are intended as temporary data for view and print only, and it is not possible to save the information. The detail noted will not be included in patient, examination, or report information.

1. To add a memo to a request, click the triangle below the *Memo* button in the ribbon bar of the *Request* screen and select the checkbox next to the memo you want to edit; if there is no memo so far, only a standard memo form is available in the list.
2. Click the *Memo* button in the ribbon bar.
3. The selected memo or memo form will be opened in the text editor. You can now edit the memo.

6.6 Schedule a Requested Examination

Click the *Scheduler* button in the ribbon bar of the *Request* screen to schedule the requested examination.

6.7 Delete a Request

Click the *Delete* button in the ribbon bar of the *Request* screen to delete the request.

6.8 Show All Requests

You can access all saved requests for the patient from the *Request* screen.

1. Click the *Show All* button in the ribbon bar of the *Request* screen.
2. Next to the button, a drop-down list appears. Choose the request you want to open from the drop-down list.

3. As an alternative, use the arrows on the right-hand side of the drop-down list to browse the existing requests.

7 Scheduler

This section describes how to use the CCW Scheduler web application for scheduling exams via requests and avoiding resource conflicts.

7.1 Access the Scheduler

You can access the Scheduler from within CCW by creating a request (see Create a New Request) and clicking the *Schedule* button on the *Request* screen or by clicking *Scheduling* from the landing page or from the main *Menu*. The Scheduler opens as a new tab on the default web browser, which can be left open as long as needed, i.e. it is not correlated to any patient or exam screen and will not close when you close any patient or exam screens.

Exiting CCW or using the *Log in as another user* function in CCW will automatically log you out of the Scheduler web application.

You can also access the Scheduler directly from the web browser by typing the Scheduler url or IP address (contact your system administrator for the Scheduler url) and logging in using your CCW (or, if configured, LDAP) credentials. You can log in to the Scheduler on different browsers (not tabs), or from different PC's and mobile devices simultaneously. These sessions are independent, i.e. logging out from one of them does not affect the others.

- ***Remember me*** - When unchecked, you will be automatically logged out after an idle duration of 20 minutes. When checked, you will never be automatically logged out even after closing the browser, closing the browser tab, shutting down the PC, etc.

To sign out directly in the Scheduler, click the username at the top and click *Sign Out*. Signing out resets the selected Date and Organization but the selected View option (day or week) will always persist until manually changed.

7.2 Scheduler Display

When the Scheduler is opened,the user is scrolled to the current time as indicated by a blue horizontal line, which moves down automatically as time advances.

The Scheduler allows you to schedule and display exam requests in a daily or weekly graphical format. After exam requests are scheduled, you can use different resource calendars to display only the pertinent schedule information (see Resource Calendars). For example, you can display the schedule by exam mode, room, and assigned staff member.

The options menu at the top right provides access to the same help options as in the CCW Client (see Help Options). Third-party software licenses are accessible by clicking *Licenses* on the *About* page.

7.2.1 Requests

Requests can be viewed on a daily or weekly basis using the *Day* and *Week* buttons. Clicking the date label opens the calendar view to select a specific date. Depending on the selected view *Day* or *Week*, requests are displayed for the selected day or the week that includes the selected day.

The arrow buttons to the left of the date label can be used to go backward or forward one day or one week, depending on the selected view.

Requests are represented as rectangular boxes on the resource calendars. They are located with respect to their start-end hours. The content of the box can include the following information:

- Patient name
- Unique request identifier
- Exam mode
- Procedures
- Staff
- Room
- Device
- Hardware
- Site
- Comments

Information that does not fit into the box is not displayed, e.g. when the duration of requests is short or when several resource calendars are displayed. Hovering the mouse pointer over the request displays a tooltip containing the complete information.

7.2.2 Color Legend

Requests have different background colors with respect to their states as defined in the color legend at the bottom-right.

7.2.3 Conflict Management

Two requests with overlapping resources create a conflict when they are scheduled to an overlapping time interval.

If a request has a conflict, the first line of the request box has an orange-colored background and the tooltip window will list the conflicting resources.

Requests can have resource conflicts with each other with respect to:

- Staff
- Rooms
- Devices
- Hardware
- Sites
- Patients

7.2.4 Resource Calendars

The Scheduler main view consists of one or more resource calendars displayed as columns. Each resource calendar is a filter of requests displayed per day or per week. The events are vertically organized with respect to their starting hours and duration.

Configuration of resource calendars is per user, allowing you to personalize your resource calendars by adding, editing and removing them.

To add a resource calendar:

1. Click the *Add Calendar* button on the navigation menu.
2. In the *New Resource Calendar* dialog, select the *Resource Type* and/or *Exam Mode*. If no filters are selected from the drop-down lists, all requests will be displayed.

   Resource types:

   - ***Rooms*** - e.g. "All events in Room 1".
   - ***Devices***
   - ***Hardware***
   - ***Site***
   - ***Staff*** - Select a specific staff member or role or a combination (e.g. "All requests of Dr. Gibson as Diagnostic Cardiologist").
3. Click *Save* to save the resource calendar. The Scheduler main view updates automatically to display the new resource calendar.

While resource type and exam mode filters can be combined, e.g. "All CATH events in Room 1", it is not possible to combine multiple resource types, e.g. "All events of Diagnostic Cardiologist in Room 1".

To edit a resource calendar, click the title of the resource calendar in the Scheduler. This opens the *Edit Resource Calendar* dialog, where you can edit the existing *Resource Type* and *Exam Mode* of the resource calendar. You can delete the resource calendar from the *Edit Resource Calendar* dialog or by clicking the close icon (X) that appears on the resource calendar title row when hovering the mouse pointer over the resource calendar title.

7.2.5 Anonymized View

Patient-related information can be hidden, and certain functionality disabled by using the *Show Anonymized View* option menu item.

When *Show Anonymized View* is selected:

- Patient-related data in the request box and the tooltip are replaced by the unique request identifier
- The comments sections are hidden
- Editing events functionality is disabled
- The calendar date is set to the current day
- The calendar moves down automatically (auto-scrolls) as time advances

Click *Close Anonymized View* in the option menu to exit anonymized view.

7.3 Schedule Requests

To create a new request:

1. There are two ways to start adding a new request from the Scheduler:
    - Click the *Add Request* (+) icon from the navigation menu.
    - Double-click a time slot in the resource calendar or a slot in the *No time yet* section at the top of the resource calendar. Any filtering applied to the resource calendar is automatically applied to the request but can be changed.
2. In the *New Request* dialog, start typing the patient name, which will auto-populate the patient list. The search can be performed on the patient name, surname and other patient identifiers that are configured on the system (e.g. SSN, MRN, etc.).
3. Select the patient from the list and click *Next*.
4. Select *New Request*, select an *Exam Mode* and *click* Next. This step will be skipped if the new request was added by double-clicking a time slot in a resource calendar that is filtered by exam mode.
5. In the *New <exam mode> Request* dialog, enter the details of the new request:
    - ***Procedures*** - Multiple procedures can be selected from the drop-down list or by typing the procedure and then selecting. Selected procedures can be removed by clicking the 'X' icon. You can add custom options to the procedures if applicable.
    - ***Date/Time*** - The start/end times and duration fields auto adjust depending on how they are changed, e.g. if duration time is set, entering a start time will auto adjust the end time. Checking the *No time yet* checkbox disables the start and end time selection boxes.
6. (Optional) Select staff by assigning them to roles and select resources from the drop-down lists.
7. (Optional) Enter any applicable comments in the *Comments* field.
8. Click *Save* to add the new request to the resource calendar. Requests with *No time yet* selected are displayed in the topmost row of the resource calendar.

7.4 Reschedule/Edit Requests

To edit an existing request using the *Edit <exam mode> request* dialog:

1. Click on a scheduled request in the resource calendar or an ordered request from the *No time yet* section.
2. In the *Edit <exam mode> request* dialog, edit the existing request details and click *Save* when done. The exam mode and patient details cannot be changed.

   Existing requests can also be edited from the *New Request* dialog when following the create a new request workflow described in Schedule Requests.

To reschedule an existing request using drag and drop:

1. Click to drag a scheduled request from its time slot or an ordered request from the *No time yet* section and drop it to another time slot of the same resource calendar.

To extend the duration of a scheduled request directly in the resource calendar:

1. Click and drag the lower boundary of the scheduled request and drop it to the desired end date/time.

7.5 No-date-yet Requests

Requests created from the *Request* screen of CCW (see Data Fields and Checkboxes) without a start date are visible in the Scheduler in a sidebar on the right of the resource calendars. The sidebar can be closed and opened by clicking the *Unscheduled Requests* button on the navigation menu, which also displays the number of requests without a start date. This list is updated when changes are made, either in the Scheduler or by editing requests in CCW.

To schedule a no-date-yet request, drag it from the *Unscheduled Requests* list and drop it to a time slot or to the *No time yet* area in a resource calendar. The request will then be removed from the *Unscheduled Requests* list.

A no-date-yet request can be dropped to a resource calendar if the calendar:

- defines the same exam mode as the no-date-yet request
- has not defined an exam mode but a resource that can be used for the request's exam mode
- has neither defined a name nor a resource

Example:

Assume a resource calendar for which the room "Cath Lab 2" was defined, but no exam mode. The room "Cath Lab 2" implies that this room can only be used for CATH exams. Therefore, a user can drop CATH no-date-yet requests to that calendar, but not ECHO no-date-yet requests.

When a no-date-yet request is dropped to a resource calendar for which a resource filter is defined, the request's resources are modified according to the resource calendar's filter:

- For single-value fields (e.g. Room, Site): The request's resource is overwritten by the resource calendar's resource
- For multi-value fields (e.g. Staff): The request's resource is merged with the resource calendar's resource

Example 1:

Assume a resource calendar for which the room "Cath Lab 2" was defined and assume a CATH no-date-yet request for which the room "Cath Lab 1" was defined.

When that request is dropped to the resource calendar, the request's room gets updated from "Cath Lab 1" to "Cath Lab 2".

Example 2:

Assume a resource calendar for which the Role "Diagnostic Cardiologist" and the Staff "Dr. Irvin Becker" was defined and assume a no-date-yet request with Role "Referral Physician" and Staff "Dr. John Smith".

When that request is dropped to the resource calendar, the request will have both "Diagnostic Cardiologist" - "Dr. Irvin Becker" and "Referral Physician"- "Dr. John Smith".

7.6 Delete Requests

To delete an existing request:

1. Click on a scheduled request in the resource calendar.
2. In the *Edit <exam mode>* request dialog, click *Delete Request*.
3. When asked to confirm deletion, click *Yes*.

7.7 Patient Search

To view all scheduled requests for a particular patient:

1. Click the *Search* icon and start typing the patient name, which will auto-populate the patient list. The search can be performed on the patient name, surname and other patient identifiers that are configured on the system (e.g. SSN, MRN, etc.).
2. Select the patient from the list to view the requests.
3. Clicking on a scheduled request opens the *Edit <exam mode> request* dialog, with the existing request details loaded. The request can be rescheduled from this dialog, but the exam mode and patient details cannot be changed.
4. Click *Exit Search* to go back to the Scheduler main screen.

7.8 Print the Schedule

The daily or weekly schedule can be printed by your local printer at any point using the print functionality of the web browser.

7.9 Print Requests

Existing requests can be printed directly from the *Edit Request* dialog. A newly-created request cannot be printed. The *Print* button will be disabled in this case. The request must be saved first.

Please ask your system administrator if you need to print requests.

To print a request:

1. Click the *Print* button at the bottom of the *Edit Request* dialog.

   This opens the *Print Preview* dialog, which displays the values of the request in your custom print template.
2. Click the *Print* button on the *Print Preview* dialog starts your browser's print functionality to do the actual printing. Depending on the browser, this can open another print dialog or start the printing immediately.

Unsaved modifications will be printed. There is no auto-save triggered by the printing.

7.9.1 Mark Requests as Printed

Existing requests can be marked as being previously printed.

This feature is only available if printing requests is enabled. Please ask your system administrator if you need to print requests.

To mark requests as printed, check the *Mark as Printed* checkbox next to the *Print* button in the *Edit Request* dialog. The *Mark as Printed* checkbox is not automatically checked after clicking the *Print* button and must be checked manually.

- The displayed timestamp indicates when the checkbox was checked.
- The check mark and timestamp stay with the request when you click the *Save* button.
- When hovering over a request in the calendar, the tooltip will display the print timestamp if the checkbox was previously checked.

8 Admission Screen

This section describes the various data fields of the *Admission* screen.

8.1 Access the Admission Screen

You can access the *Admission* screen from the *Patient Information* screen:

- Click the *Admission* icon to create a new admission for the current patient.

To edit an existing admission:

- Double-click an existing admission on the *Exam Log* tab if you want to edit the admission. The *Admission* screen appears.

8.2 Admission Screen Toolbar

The *Admission* toolbar allows you to use buttons to access frequently used functions.

When you create a new admission, some of the buttons in the toolbar will appear grayed out until the admission is saved.

- ***Save Button*** - Saves new admission data or changes made to an existing admission record.
- ***Refresh Button*** - Refreshes all admission data in the admission record.
- ***Default Button*** - Resets all fields in the *Admission* screen to the default values.
- ***Attachments Button*** - Opens the *Attachments* window. You can add, edit or delete attachments such as images (e.g. x-rays), digitized voice recordings, or text documents as well as other types of attachments for the current patient.
- ***All Studies Button*** - View all existing reports applying to the current patient in a single location in read-only mode.
- ***Discharge Button*** - When you click the *Discharge* button on the *Admission* screen, the *Discharge Date* and *Discharge Time* fields are set to the current date and time. The *Admission* screen is saved, and you are returned to the *Patient Information* screen. On the *Exam Log* tab on the *Patient Information* screen, the former admission is replaced with this discharge.

  If a discharge is performed by mistake, you can delete the discharge date on the *Admission* screen and save the screen. This deletes the discharge.

  If an admission is classified as Ambulant (outpatient), you can create a new admission without completing a discharge of the ambulant admission. Ambulant (outpatient) admissions are closed automatically after midnight each day. These admissions are then displayed in the system as discharges. Your facility may decide to not use Admission/Discharge management. If that is the case, there is no need to complete a discharge on an open admission; all exams for the patient are then assigned to the open admission.

- The *Discharge* button is disabled unless a current admission is present for the patient.
- If you enter the discharge date and time manually, you must click the *Save* button to log the discharge.
- After a patient is discharged, a new admission is required before a new exam can be recorded. This is because every exam must be attached to a current admission.
- Existing exams that are attached to the discharge can be edited or completed even after the discharge is entered.

- ***Delete Button*** - Irretrievably deletes the current admission. However, for reasons of data security, it is not possible to delete an admission as long as there is dependent data, such as exams, findings or documents for this patient. Therefore, delete the following items in the correct order if you want to delete an admission record.
  - Reports
  - Findings
  - Exams
  - Admissions
- ***Import Button*** - Imports the Referring Institution, the G.P. and the Receiver from the last admission.
- ***Memos Button*** - Use the *Memos* button to select and print pre-defined admission memos.

8.3 Admission Data

The *Admission* screen records all data pertaining to the patient's actual appearance in the hospital. As long as there is no discharge, the admission is referred to as open admission and all new exams are attached to this admission. There can only be one open admission at a time.

1. Access the *Admission* screen.
2. Enter the following information on the *Admission* screen. Information may populate (if sent) from ADT interface or may be manual entry.
   - ***Admission No.*** - This number is generated by the software after the admission record is saved. You can enter a number manually; however, if that number already exists in the Centricity Cardio Workflow database, the number will be rejected. If the admission was created by the hospital information system, the admission number is generated by that system. The admission no. is also referred to as case no.
   - ***Visit No.*** - You can enter a visit number in this field.
   - ***Admission Date/Time*** - These fields are generated by the software when the *Admission* screen is saved. However, you can change these fields, if necessary.
   - ***Discharge Date/Time*** - Fill in the discharge date and time.
   - ***Referring Institution*** - Use the combo box to select the name of the institution that sends or refers this patient for admission. (This field uses the same catalog as the *G.P.* field.) The referring institution is the default addressee in the basic report templates, e.g. the CATH template. The related catalog is extended.
   - ***G.P.*** - Use the combo box to select the name of the patient's general practitioner (this field uses the same catalog as the *Referring Institution* field).
   - ***Type of Referral*** - Use the combo box to select if this is an inpatient or outpatient admission. Within the related catalog, you can assign the flags "amb"

(ambulatory=outpatient) or "stat" (stationary=inpatient) to the different list entries, i.e. although the list entries themselves are customized, these flags define the admission as inpatient or outpatient if the appropriate entry is selected. An outpatient admission does not require a discharge; this means that an outpatient admission is discharged automatically the day after the outpatient admission was created (if no flag is specified, the default selection is inpatient).

- ***Transport*** - Use the combo box to select the type of transport required for this patient, such as an ambulance.
- ***Unit*** - Fill in the unit.
- ***Room*** - Fill in the room.
- ***Bed*** - Fill in the bed.
- ***Station*** - Fill in the station.
- ***Patient Class*** - User may enter room type if desired.
- ***Registered*** - This is a read-only checkbox indicating if the admission is registered or unregistered.
- ***Initial Diagnosis*** - Click the down arrow to display the *Diagnosis* catalog screen. From this screen, double-click as many applicable diagnoses as necessary. The diagnoses appear in the lower left window on the screen. When you have finished entering the initial diagnosis, click the *Accept* button.
- ***Planned Exam*** - Click the down arrow to display the *Examination* catalog screen. From this screen, double-click as many applicable planned exams as necessary. The exams appear in the lower left window on the screen. When you have finished entering the planned exams, click the *Accept* button.
- ***Receiver*** - You can specify a list of institutions as a subset of the referring institutions catalog. This list represents the distribution list for reports if you select a report template that contains a distribution list. For example, the standard CATH report template uses the referring institution stated on the Admission screen as the addressee and the Receiver List as its distribution list. Click the + (plus) button to create a new row in the table where a referring institution can be entered. All changes to this table are saved when the *Admission* screen is saved.

  The Receiver list applies to the current admission only. This list can also be edited after the report is generated and before it is printed.
- ***Insurance Tab*** - Use this tab to enter insurance-related information by specifying *Code*, *Designation*, *Type*, and *Policy Number*. Catalog entries can be created for the codes (name of the insurance company) and the type. Click the + (plus) button to create a new row in the table where the insurance information can be entered.
- ***ICD Diagnosis Tab:***
    - ***ICD 10 Primary Diagnosis*** - This is a read-only field that is populated from the ADT interface.
    - ***ICD 10 Secondary Diagnosis*** - This is a read-only field that is populated from the ADT interface.
    - ***ICD 9 Primary Diagnosis*** - Can be selected from the drop-down list or populated through the ADT interface.
    - ***ICD 9 Secondary Diagnosis*** - Can be selected from the drop-down list or populated through the ADT interface.

3. Click the *Save* icon when the admission information is complete.

You cannot record exams until the admission is saved. If you click *Exam* on the *Patient Information* screen and an open admission does not exist, you are told there are no admissions available. However, it is possible to create an unlinked exam that can be linked to an admission at a later time.

9 Exam Screen

This section describes how to navigate the *Examination* screen and explains common functions of the patient banner, toolbar, and exam finalize section.

9.1 AutoSave Exam Data

Examination data is automatically saved for normal forms; therefore, a save button is not displayed when these forms are visible.

When you change data within an examination, AutoSave is executed in the background.

If any changes are made to an examination, other users that currently have the same examination open will receive a notification that changes have been made.

9.2 Open an Existing Exam

From the *Patient Information* screen:

1. Search and select a patient from the database (see Searching for Patients).
2. Exams are listed in the *Exam Log* tab. You can sort the entries by clicking the column headers. Click the top left corner to return to the default sorting.
3. Double-click an existing exam in the list if you want to view and/or edit the exam data.

WARNING: After the exam is displayed, confirm that it is the correct record by verifying the examination number and examination date.

9.3 Create a New Exam

From the *Patient Information* screen:

1. Search and select a patient from the database (see Searching for Patients).
2. Click the *Exam* button in the ribbon bar if you want to create a new exam in the exam mode currently indicated below the button.

   To create an exam in an exam mode different from the one currently indicated below the *Exam* button in the ribbon bar, open the drop-down list and choose the exam mode.
3. In the *Create Exam* dialog, enter a unique number for this exam in the *Exam No.* field. If no exam number is entered, the next number in the numbering sequence for that exam mode will be used as the exam number.

   If a request is converted to an examination (see Convert Request to Exam), the request is pre-configured to have an automatically generated exam number. In this case, the *Exam No.* field will contain that value and be set as read-only.

4. Select the admission to which you want to assign the exam and click *Create Exam*.
5. The *Exam* screen opens.

9.4 Patient Banner

The patient banner at the top of the *Examination* screen includes patient information, a search control, and exam finalize functions.

9.4.1 Patient Info

The patient information section of the patient banner includes the following information about the patient:

- Patient last name and first name; separated by a comma.
- The information icon next to the patient name launches a pop-up window with additional information about the patient.
- Patient date of birth.
- MRN. If the value is empty, it displays "---".
- Allergies, if any, with the number of allergies in brackets. Hovering the mouse pointer over the red icon before the label displays the list of the patient's allergies.

  This section will be blank if there are no allergies associated to the patient.
- Exam ID. If the value is empty, it displays "---".
- Order Number. If the value is empty, it displays "---".
- Admission ID. If the value is empty, it displays "---".

Patient info values that are too long to show completely in the pane will be truncated at the end, with the omitted text replaced by an ellipsis. Hovering the mouse pointer over the values displays a tooltip containing the complete values.

9.4.2 Search Forms

You can search for keywords within forms using the search box in the *Examination* screen patient toolbar or by opening the *Search Forms* dialog directly by pressing **CTRL+F** while working in a form.

Search results in the *Search Forms* dialog are displayed per *Result Type*, which can be filtered by:

- Field labels
- Current value of field
- Entries of catalogs (e.g. Items in a drop-down list)

Depending on where the keyword was found, the keyword in the results will be displayed in bold.

The *Location* column indicates on which form the keyword was found. By clicking the hyperlink in the *Location* column, you are taken to the relevant field in the form, which is displayed with a temporary turquoise border.

- If on *Form & Previous* view, the corresponding field in the previous exam is also displayed with a temporary turquoise border.
- If the field is contained in a table and no data currently exists in the table, you will be asked if you would like to create a new row so that the field can be focused; otherwise the whole table will be selected.

Search is limited to 300 results. If more results are found, then the search should be refined using search options or filtered by result type. The following search options can be used when searching for keywords from within the *Search Forms* dialog:

- ***All words*** - To show a result, all words you enter must be found. This is the default.
- ***Any words*** - To show a result, at least one of the words you enter must be found.
- ***Phrase*** - To show a result, the exact phrase you enter must be found.

Search is not available for Supplies and Attempts in the *Intervention* form.

9.4.3 Exam Finalize Functions

The exam finalize functions section of the patient banner includes functions used after completing the report:

- ***Check*** - The *Check Required Fields & Validation Errors* dialog displays missing required fields, fields with invalid data, and calculation errors. See Check Validation Errors.
- ***Lock/Unlock Exam*** - Used to lock or unlock current exam, i.e. to prevent or allow it to be edited. This button is disabled when the Procedure Log is selected.
- ***Addendum*** - Add an addendum for a signed report. This button is visible and enabled depending on your access rights and only when there is at least one signed report for the exam. See Add an Addendum.
- ***Revise Data*** - For exams containing signed reports and for users with the appropriate access right, subsequent versions of reports can be created. See Revise Data.
- ***Export*** - Export the data of the current examination to a Hospital Information System (HIS).
- ***Sign*** - Sign the report. This button is visible and enabled depending on your access rights. See Sign or Confirm a Report.
- ***Close*** - Closes the current exam.

9.5 Exam Functions Toolbar

9.5.1 Exam Info Pane

An exam info pane above the navigation pane displays key details about the currently selected exam. Switching to a different exam mode automatically updates the displayed information.

Information displayed in the exam info pane includes:

- Exam mode
- Date of the examination
- BSA value (sourced from the calculated BSA field in the examination main form

- Patient class (In or Out Patient; sourced from *Patient Class* field of the admission)
- Study location (sourced from the *Room* field in the examination main form

If any of these values are absent in the forms, then this exam info pane will display a blank area where the value should be. Patient class and study location values that are too long to show completely in the pane will be truncated at the end, with the omitted text replaced by an ellipsis. Hovering the mouse pointer over the values displays a tooltip containing the complete values.

Three icons can appear on the right of the exam info pane, stacked vertically, to provide the following functionalities:

- ***Change the exam mode*** - Changes the exam mode of the current examination in the event the incorrect exam mode was linked to a request. This button will always be visible and enabled based on examination context.
- ***Unlink exam*** - Unlinks any previously linked images from the exam. This button will be visible only if applicable and hidden otherwise.
- ***Verify exam*** - Verifies the correct exam mode type. This button will be visible only if applicable and hidden otherwise.

9.5.2 Exam Functions

The exam functions toolbar allows you to use buttons to access frequently used functions:

- ***Quick Report*** - Displays the list of Quick Report templates. Selecting a Quick Report template applies that template to the final report as previewed in the report pane.

  Any existing data in the form (or previously applied template) that conflicts with data in the newly applied template will be overwritten by data in the new template. However, blank/empty fields of an applied Quick Report template will not erase any existing data in corresponding fields of the form (or previously applied template).
- ***Undo*** - Clicking the *Undo* button once reverts the last data modification in the exam. Clicking the *Undo* button repeatedly, reverts each data modification in backward order until all changes have been undone. If all changes have been undone, the *Undo* button is then disabled.

  If a row in a grid was deleted, then the Undo button will bring back the row, but insert it below all other rows at the end of the grid. If a row was added, the *Undo* button will remove it again.

  After adding fields/sentences to conclusion, they will be removed again by clicking the *Undo* button. After removing fields/sentences from conclusion, they will be added back by clicking the *Undo* button. After resetting a sentence to its original text, the *Undo* button will bring back the text from before. Editing, cutting or pasting of text and re-ordering of sections in conclusion can be reverted. If the same sentence is edited consecutively at a time, the *Undo* button will bring back the text as it was before doing the very first change.

  Any data that is applied to an open examination by importing data from a previous examination can be undone by clicking the *Undo* button once. This includes adding archive items to the Key Image Archive: the single undo step that is reverting the complete import will also remove the archive items that were added by the import. If an import included the heart diagram, clicking the *Undo* button removes the imported heart diagram (can only be

brought back by performing another import) and restores the previous heart diagram if one existed before the import (whether selected or not).

Removing parent data items that have children (like in Diagnostic and Intervention forms) and then clicking the *Undo* button brings back the parent item together with its children and grandchildren. For example, if an intervention with some treatments, attempts and supplies is removed, the *Undo* button brings back the intervention together with all the treatments, supplies and attempts.

Data modifications in legacy forms (e.g. Procedure Log) cannot be undone using the *Undo* button.

When measurement data arrives in CCW (e.g. coming from Universal Viewer), those fields that were filled with measurement data cannot be undone, even if there was a manual change before.

- ***Transfer*** - Transfers values from CCW to the Mac-Lab/CardioLab or other appropriate modalities. Refer to Exam Transfer for details.
- ***Sync*** - The *Sync* button can be used in three scenarios:

  Sync exam data when two or more users are in the same exam at the same time, i.e. apply changes made by the other user(s) to the current user's work.

  Apply available data from modality.

  For legacy forms that are not able to use the AutoSave functionality, the *Sync* button can be used to save the form and continue synchronizing the data.
- ***Import from Previous*** - Opens the *Import from Previous Examination* dialog. This button only works for exams within the same exam mode and within the same organization, and is disabled when the exam is loading or in a locked or signed state.

  Selecting an examination from the list and clicking the Import button imports the data from the selected examination. The report of the current exam is refreshed with imported data. Any existing data in the form that conflicts with data in the selected previous examination that is being imported will be overwritten by data stored with the previous examination. However, blank/empty fields of the selected previous examination will not erase any existing data in corresponding fields of the form.

  In the *Import from Previous Examination* dialog, you can change the number of the days to search for previous exams and click the *Refresh* button to refresh the list of previous exams for newly entered number of days.

  Double-clicking on a signed report in the "*Signed reports for...*" pane will open the selected report in a new window.

  For exam modes that include *Diagnostic* forms, the *Import from Previous Examination* dialog is extended to show a list of vessels for the selected exam.

  The "*Images and other files for...*" pane lists additional import options, depending on the layout configuration. You can choose between three options:

  - ***Heart Diagram*** - If checked, heart diagram images for the selected examination will be imported.
  - ***Files from Key Images / Waveform Archive*** - If checked, all of the files that are coming from the Key Image/Waveform Archive form for the selected examination will be imported. All of these files will be added as additional files to the current examination onto which the import of the data is being performed.
  - ***Additional Notes*** - If checked, all the notes for the selected examination will be imported and the existing ones will be overwritten.

- ***All Studies*** - Opens the *Report Overview* dialog to view reports assigned to the current patient. For details, see Existing Reports.
- ***Web*** - Launches the web interface, displaying the information for the patient currently selected on the *Patient Information* screen.
- ***Print*** - Opens a context menu and prints the option selected from the menu:
  - ***Current Report*** - Disabled if in Form only view.
  - ***Procedure Log*** - Enabled only when in the Procedure Log, and will not appear if exam mode does not include the Procedure Log.
  - ***Key Image/Waveform Archive*** - Enabled only when in the Key Image/Waveform Archive, and will not appear if exam mode does not include the Key Image/Waveform Archive.
- ***Attachments*** - Enables you to add attachments to the exam.
  a. Click the *Attachment* button in the ribbon bar; the *Examination Attachments* window opens.
  b. Above the attachments table, choose the attachments to be displayed in the table; select the checkbox *Show all attachments for the Current Patient, Current Request, Current Admission,* or *Current Examination*.
  c. To add a new attachment, click the plus (+) icon on the right-hand side of the table. A file manager window opens. In the lower right corner of the window, choose the type of file you want to attach, e.g. image, video or text document files.
  d. Navigate to the file you want to attach, mark it and click *Open*.
  e. The *New Attachment* window opens. Here you can add comments to the file and open it in an external viewer to check the contents of the file.
  f. Click *Accept* to finally attach the file to the exam or click *Cancel* to close the window without attaching a file.
  g. To edit an existing attachment, mark it in the table and click the edit (pencil) icon on the right-hand side of the table.
  h. To delete an attachment, mark it in the table and click the x (delete) icon on the right-hand side of the table; when asked, confirm the deletion.
  i. To refresh the table of attachments, click the refresh icon on the right-hand side of the table.
- ***Memo*** - You can add memos to the examination; memos are text documents that are opened and can be edited in the CCW text editor. Memos are considered temporary data that can be viewed and printed, it is not possible to save memo information to the patient, examination, or report data.
  a. To add a memo to an examination, click the triangle below the *Memo* button in the ribbon bar and check the box next to the memo form you want to use.
  b. Click the *Memo* button in the ribbon bar.
  c. The selected memo form will be opened in the text editor. You can now edit the memo.
- ***Billing*** - You can assemble and export the necessary billing information for the current examination. See Exam Billing for more details on exam billing.
  a. Click the *Billing* button in the ribbon bar. The *Billing* window opens. If certain billable items have not been enabled in the configuration, then the corresponding button in the Billing Cockpit will be grayed out. Contact your system administrator for billing

configuration.

b. In the upper part of the window, you can choose billing positions. Under the following buttons, *Billing Codes*, *Material*, *Procedures*, and *Exam Codes*, you find predefined configured lists.

c. Double-click the applicable billing items to add them to the billing list. You can manually add or credit the materials, procedures, and exam codes assigned to the current exam. Billing codes assigned via any of the buttons in the Billing Cockpit will not be referenced and will be remarked as Manual.

d. To remove rows from the list, mark the row in question and click the x (delete) icon on the right-hand side of the table. The row will be marked for deletion. Only manual items can be deleted from the Billing Cockpit.

e. If wanted, add a remark in the *Remarks* field.

f. To export the billing codes to a predefined billing system, click the *Export* button. Items that do not have billing codes assigned or manually entered will not export and will remain in the Billing Cockpit as pending.

g. To save the billing information, click *Accept*; to discard your inputs and close the window, click *Cancel*.

- ***Inventory*** - You can specify supply materials used in the examination. See Exam Inventory for more details on exam inventory.
  a. Click the *Inventory* button in the ribbon bar. The Inventory window opens.
  b. Using the category tree on the left and the related items list, navigate to the respective medical material and double-click the item to add it to the list.
  c. To remove an item from the list, mark the row in question and click the *Delete* button on the right-hand side of the table. A red x appears to the left of the row marked for deletion.
  d. Click the *Save* button in the menu bar to save your changes.
  e. Close the window.
- ***Change View*** - Switch the view (options depend on form type and number of exams):
  - ***Form only*** - The width of the report pane is set to 0 so that the report becomes hidden and only the form is visible.
  - ***Form & Report*** - The form and report are shown side by side with a fixed ratio.
  - ***Report only*** - The width of the form pane is set to 0 so that the form becomes hidden and only the report is visible.
  - ***Form & Previous*** - The form of the current exam and corresponding form of the previous exam are displayed side by side. Enabled only if more than one exam of a specified type exists for the patient. If more than one previous exam is assigned to a patient for the same exam mode, you can select which exam to view using the *Previous Exam* drop-down list.

  Even when the form is invisible, the navigation can still be used. Switching back to a view that also shows the form will then display the corresponding form of the selected section/subsection in the navigation.

  Forms may have an initial default view, but this can be changed using the *Change View* icon. If you change the view during the exam, this view will be kept until you change the view again

or until the CCW Client is closed. If you choose *Report-Only*, the next time they navigate to a new form, the view will follow the default configuration of that form.

9.6 Navigation Tree

The navigation tree allows you to navigate to different forms within the selected exam mode.

Upon opening an examination, all forms in the navigation tree are collapsed with only the top-level entries displayed.

- Clicking on a section that has subsections will expand the list of subsections, and the first entry in the subsection (without further subsections) will be selected, with its corresponding form shown in the form pane.
- Clicking on a subsection that has further subsections, then called subsubsections, will expand the list of subsubsections, and the first entry in the subsubsection will be selected, with its corresponding form shown in the form pane.
- Pressing the **Down** key on the keyboard when the focus is on the navigation tree navigates to the next available form or next available subsection of the current form. If the newly selected form or subsection has subsections, then the first subsection will be selected, and the list of all subsections will be expanded.
- Pressing the **Up** key on the keyboard when the focus is on navigation tree navigates to the previously available form or previously available subsection of the current form. If the newly selected form or subsection has subsections, then the last subsection will be selected, and the list of all subsections will be expanded.

Items in the navigation tree may be displayed with a gray-colored stripe to indicate that fields within that form contain data or an orange-colored stripe to indicate that a value in the form is required but missing. See Exam Data Validation for more information on data validation.

9.7 Forms

9.7.1 Exam Data

The form pane next to the navigation tree is used to record clinical information related to a specific exam for a patient.

Clicking on a field in the form pane, scrolls the corresponding field in the report into view (unless already in view) and is highlighted. If more than one field in the report corresponds to the same field in the form, the first instance of the field in the report pane is highlighted.

The comment button above the form pane allows you to add an additional comment to the applicable section of the report. Double-clicking on the free text note section in the report opens the comment dialog to edit the text. When the examination is locked, however, the comment dialog will open in read-only mode.

9.7.2 Exam Data Validation

CCW provides a visual indication in the navigation pane and in the form for the following scenarios:

- If any fields within a form contain data, then that form will be displayed with a gray-colored stripe in the navigation pane. This includes newly created forms that contain default values. For the Key Image/Waveform Archive, the gray stripe appears when there is at least one image on the form. Additionally, if the gray stripe appears next to a child form in the navigation tree, then it will also appear next to the parent form.
- If a value in the form or table is required but missing, then that form will be displayed with an orange-colored stripe in the navigation pane. In the form, the required field will be displayed with an orange-colored background. Hovering the mouse over the highlighted field will display a tooltip stating, "The field is required". If the orange stripe indicator appears next to a child form in the navigation tree, then it will also appear next to the parent form. If any fields within a form contain data but a required field does not, then the orange stripe takes precedence over the gray stripe in the navigation pane.
- If a value in the form is out of the normal range of values defined for the respective field, the field will be displayed with a yellow-colored background. Hovering the mouse over the highlighted field will display a tooltip indicating the error. If no description of the abnormal value has been configured, then the tooltip will display a message in the format "Value '<value>' is out of range" (e.g. "Value '6.5' is out of range").
- If a value in the form or table is invalid, the field will be displayed with a thick blue border. Hovering the mouse over the highlighted field will display a tooltip stating the specific validation error.
- **For forms with expanders:** If any field within an expander is invalid, a blue stripe will appear to the far left of the expander; even if the expander also has a field that is required but missing. If no fields within an expander are invalid, but at least one field is required but missing, an orange stripe will appear to the far left of the expander.
- **For forms with tabs:** If any field within a tab is invalid, a blue stripe will appear on the top of the tab header, even if there are also missing required fields. If no fields within a tab are invalid, but there are at least one field is required but missing, an orange stripe will appear on the top of the tab header.
- **For forms with popups:** If any field within a popup is invalid, a blue stripe will appear on the top of the button that opens the popup, even if there are also missing required fields. If no fields within a popup are invalid, but there are at least one field is required but missing, an orange stripe will appear on the top of the button.

9.8 Reports

WARNING: The user is responsible for checking the report and confirming that the report is correct before printing, signing, exporting or any other form of publishing.

When creating a new exam, or opening an existing exam, the report with the default template is generated and viewable in the report pane.

To select a different template, click the Current drop-down menu and choose from the list of report templates. Switching to another report template regenerates the report with the same data based on the selected template. The selected report will then be opened in the report pane where you can edit and save it. Signed reports are labelled as *Read-only* in the report template drop-down list and cannot be edited. The read-only report is treated like a PDF, allowing you to highlight and copy content but not edit, cut, paste, etc.

Changing data in any examination form automatically updates the displayed information in the report. This includes changes made to Key Images and Wall Motion diagrams.

9.8.1 Edit Report Text

Field details in the forms are part of the generated statements in the report; also called TextGen. These predefined sentences eliminate the need for you to type commonly used phrases for reporting purposes.

TextGen fields are split into the individual sentences that form them, allowing you to edit and add free text to the individual sentences directly in the report by simply clicking on the sentence in the report.

The following rules apply when editing individual sentences and adding free text to the report:

- Edits made to TextGen sentences are saved using AutoSave (see AutoSave Exam Data).
- The report pane will block any attempt to edit sentences while there is a pending refresh of the report. You must wait until the refresh is complete before editing sentences.
- Editing TextGen sentences in the report will not alter the values of the fields involved in the generation of the sentences.
- If a field which affects the sentence is modified, the sentence will be completely regenerated, and any previous manual change you made will be lost.
- All manual changes made to the findings/conclusions are automatically applied to the conclusions/findings so that they will always have the same text.

It is possible to perform copy, cut and paste operations within the report either using the context menu or the usual keyboard shortcuts **Ctrl+C**, **Ctrl+X** and **Ctrl+V**, respectively.

- The copy operation is only possible when some text is selected.
- The cut operation is only possible when the selection includes only TextGen editable text.
- The paste operation requires that the current input position (where you want to paste the copied content) is inside an editable TextGen sentence. The pasted text will have the same formatting as the TextGen sentence that it is pasted to.

It is possible to change the order of the sections within the conclusions. The sections can be moved up/down/to the top/to the bottom inside the level they belong to by clicking on a section header in the conclusions and using the *Reorder Section* button at the top of the report pane.

9.8.2 Take to Field

To navigate to the first occurrence of a field in the form:

1. Right-click on the sentence in the report that was formed from that value and select the option *Take to field: <Field>* from the context menu; where *<Field>* is the name of the field.
2. In case more than one field was used to form the sentence, then the option *Take to field...* will list each source field in a submenu. Select the relevant field from the submenu.

   After the take-to-field operation, the focus will be moved to the form; it will not stay in the report pane.

To view the first occurrence of a field in the form but keep the focus in the report:

1. Left click on a report field or sentence. The corresponding form field is brought into view and it is highlighted in the form pane.
2. In case more than one field was used to form the sentence, then the first source field will be highlighted and displayed in the form pane.

9.8.3 Add to/Remove from Conclusions

To add TextGen sentences from the findings section to the conclusions section:

1. Right-click on the sentence in the report that was formed from that value and select the option *Add '<Field>' field to Conclusions* from the context menu; where *<Field>* is the name of the field.
2. In case more than one field was used to form the sentence, then the option *Add to Conclusions* will list each source field in a submenu. Select the relevant field from the submenu or select *Complete sentence* to add the whole sentence to conclusions.
3. Complete sentences can also be added to the conclusions by:
   a. Double-clicking the sentence if the sentence is not already included in the conclusions or if only some of the fields used to form the sentence were previously added to the conclusions. If the sentence was already added to the conclusions, then double-clicking the sentence will trigger a warning that the sentence was already added and asks if you would like to delete the sentence from the conclusions.
   b. Clicking to highlight a TextGen sentence in the report and clicking the *Copy or remove...* button at the top of the report pane.
4. If sentences are grouped, they will be highlighted together in the report text. The group of sentences may be added to the conclusions by right-clicking on one of the sentences in the report, and selecting *All sentences* from the *Add to Conclusions* submenu.

To remove TextGen sentences from the findings section to the conclusions section:

1. Right-click on the sentence in the report that was formed from that value and select the option *Remove '<Field>' field from Conclusions* from the context menu; where *<Field>* is the name of the field.
2. In case more than one field was used to form the sentence, then the option *Remove from Conclusions* will list each source field in a submenu. Select the relevant field from the submenu or select *Complete sentence* to remove the whole sentence from conclusions.
3. Complete sentences can also be removed from the conclusions by:
   a. Double-clicking the sentence from the findings (if previously added) or directly from the conclusions. A warning dialog will warn that the sentence was already added and asks you if they would like to delete the sentence from the conclusions.

b. Clicking to highlight a TextGen sentence in the report and clicking the *Copy or remove...* button at the top of the report pane. A warning dialog will warn that the sentence was already added and asks you if they would like to delete the sentence from the conclusions.

If sentences were formed from the same multi-select field, clicking one of these sentences will highlight the clicked sentence in dark gray, while the other sentences formed from the same multi-select field will be highlighted in light gray. The group of sentences may be added to/removed from the conclusions by right-clicking on one of the sentences in the report, and selecting *Add/Remove all highlighted sentences*.

9.8.4 Delete Field Values of a TextGen Sentence

It is not possible to delete the field values of TextGen sentences if the exam is locked.

To delete a field value in the form:

1. Right-click on the sentence in the report that was formed from that value and select the *Delete <Field> field* option from the context menu; where *<Field>* is the name of the field.
2. In case more than one field was used to form the sentence, then, in addition to the *Delete <Field> field* entries in the context menu for each field, another option *Delete All fields* is available to delete all fields that formed the sentence.
3. If the selected sentence was generated from a code in an MSF field, then you have the possibility of deleting the codes that generated the sentence while keeping the other selected codes of the field by clicking *Delete '<MSF code>' code*; where *<MSF code>* is the code of the field.

Deleting a field deletes the value in the database and refreshes the report. Further editing of the report will not be possible until the refresh is complete. If all fields of a TextGen sentence are deleted, then the sentence will be removed upon refresh. If the removed sentence was previously added to the conclusion (see Add to/Remove from Conclusions), then the sentence will also be removed automatically from the conclusion.

A field value can also be deleted from a sentence that was previously added from diagnostic to the conclusions. When deleting a field value from the conclusions, a dialog will pop up after clicking *Delete <Field> field* and asks you to decide how to proceed.

- ***Delete from study*** - The data will be deleted from the database and the sentences dependent on this data will be re-generated.
- ***Remove from Conclusions*** - The sentence will be removed from the conclusions but its source will be not affected.

9.8.5 View and Reset Original Report Text

It is not possible to reset TextGen sentences to original if the exam is locked.

To view the original TextGen sentence that has been manually edited:

- Right-click on the sentence and select the *View Original* option from the context menu. The original sentence is displayed in read-only mode.

To reset the original TextGen sentence that has been manually edited:

- Click *Reset To Original* in the *View Original* dialog to reset the sentence to its original value and close the dialog.

  Or

- Right-click on the sentence and select the *Reset to Original* option directly from the context menu.

9.8.6 Search Text in the Report

The *Find text* button above the report pane lets you search inside the report template.

1. Click the *Find text* button or press **Ctrl+F** when the focus is in the report pane.
2. In the *Find text in Report* dialog box, enter the search term and select the direction of the search (*Down* is selected by default).
3. Select the *Match case* checkbox if you want to perform case-sensitive searches for terms.

9.8.7 Check Validation Errors

To check for validation errors:

1. Click *Check* to open the *Check Required Fields & Validation Errors* dialog, which displays missing required fields, fields with invalid data, and calculation errors.
2. Click the hyperlink in the *Field Location* column to go directly to the field where the error occurred and resolve the error.

You will also receive a prompt to resolve validation errors if any missing required fields, fields with invalid data, or calculation errors exist when you click *Sign*.

9.8.8 Sign or Confirm a Report

Depending on your configuration, reports are either signed or confirmed.

To sign or confirm a report:

1. Click *Sign* to open the *Sign Report(s)* dialog, with the latest version of unsigned reports listed and unselected by default.
2. Enter your password (or PIN if using smartcard/digital signing authentication), select at least one report to be created and routed, and enter any additional comments.
3. A *Finalize for all users* option will appear in the report signing dialog for users with access rights. Users with this access right will be able to sign a report for several users at once; independent of whether that user was a participant of the exam.
4. Selecting the checkbox *Report routing preview* will open the *Report Routing Preview* dialog upon report signing. See Report Routing.

5. Selecting the checkbox *Close exam and return to worklist* will close the CCW exam and any associated images and return you to the worklist. Manually checking this box when signing will change the default user setting to always be checked when signing.
6. Click *Sign* to sign the selected report(s).

9.8.9 Add an Addendum

An addendum can only be added to signed/confirmed reports.

To add an addendum to a signed report:

1. Click *Addendum* in the exam finalize functions section of the patient banner to open the *Create Addendum* dialog, with the latest version of the signed reports listed and checked by default.
2. Enter the password, select the relevant report(s), enter the addendum text, and click *Apply*.

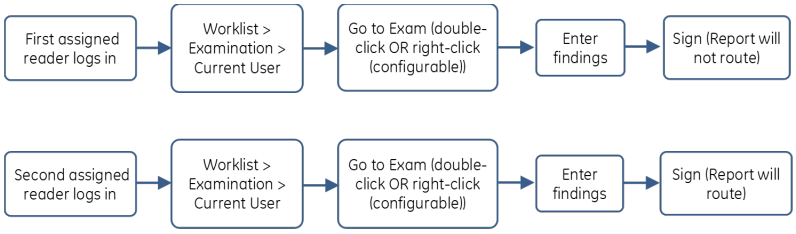
   By clicking *Apply*, the addendum text is added to the selected reports. The report with the addendum displays the following statement at the beginning of the report: "This report contains a post-confirmation addendum and replaces previous reports". The report with the addendum is then shown in read-only mode in the report pane as a fully signed report.

9.8.10 Dual Signature

Two different clinical readers may sign one clinical report. This clinical report contains exam elements pertaining to each reader and their role within the exam. The assigning of these elements is done through report template configuration, using one module sequence for each signature.

Additionally, once the assigned report elements are read and signed, these assigned fields may be locked to prevent the other reader from making any changes to data not assigned to them.

The following diagram illustrates the workflow steps for Dual Signature:



If one of the signers selects the incorrect template and signs the report, their signature will automatically carry over to the correct report; in this case the dual/combo report. This feature depends upon configuration in the template designer. All applicable module sequences must be assigned to the correct role.

For example, the diagnostic physician selects the diagnostic report instead of the combo report and signs it. The interventional physician selects the combo report; the diagnostic physician signature will appear as it should as long as the module sequence associated to the diagnostic report has been assigned to the Diagnostic Physician role.

9.8.11 Existing Reports

To view existing reports for the selected patient:

1. Click *All Studies* in the exam functions toolbar.

   The *Report Overview* dialog opens and displays a list of reports and a list of imported documents. The report list provides basic information on the reports, such as the report status, exam mode, exam no., admission no., creation date, confirmation date, and template.
2. In the report list, double-click the report you want to view.
3. The report view ribbon bar allows you to launch the *Report Routing Preview* dialog (see Report Routing), print, copy, change layout, and zoom in/out of the report.

To delete existing reports for the selected patient:

1. In the report list, click the report you want to delete.
2. On the right-hand side of the report list, click the *Delete* button.

The *Imported Documents* section of the *Report Overview* dialog shows reports imported from other modalities (e.g. Mac-Lab).

- You can view reports by double-clicking on the desired report. Reports open in read-only mode and cannot be edited.
- You can delete reports by clicking the *Delete* button on the right-hand side of the *Imported Documents* list.
- Signed reports are indicated by a lock symbol; unsigned reports are indicated by a letter symbol.
- Report routing and printing are only available for signed reports.

9.8.12 Report Routing

Reports can be routed from several locations:

- Right-click on a report in the *Report Overview* dialog and select *Report Routing* to open the *Report Routing Preview* dialog or select an export or email option directly from the context menu.
- Double-click on a report in the *Report Overview* dialog and click the *Report Routing* ribbon item in the *Report View*.
- Select the checkbox *Report routing preview while signing a report* will open the *Report Routing Preview* dialog upon report signing.

To route reports from the *Report Routing Preview* dialog:

1. Routing destinations for the given reports are listed in the *Routing Destinations* pane. If necessary, you can add, edit or delete routing destinations.
2. If any items exist in the *Exceptions* pane, click *Resolve* to resolve issues with report routing destinations for each report.
3. Click *Next* to configure *Export and Print Options*.
4. In the *Export Options* pane, select the export types for each available report.

5. In the *Local Report Printouts* pane, select the printer to be used for local printouts and select the number of printouts per report.
6. Click *Done* to route the report(s).

9.8.13 Revise Data

Only exams with signed/confirmed reports can be revised and only users with the appropriate access right and revision worklow configured can revise data.

To revise a signed report:

1. Click *Revise Data* in the exam finalize functions section of the patient banner.
2. Confirm that you are aware of data deletion.
3. The exam lock is then removed, and you can now make changes to the data and again sign the report. In the *Sign Report(s)* dialog, previously created reports that have been revised will be labeled with the next version of the report.

9.9 Exam Billing

The *Billing Cockpit* window allows you to manage billing tasks for exams.

The billing cockpit may be launched in several ways:

- By selecting the *Billing* icon from the exam functions toolbar. This icon will not be active if billing is not active in the Billing Configuration Panel.
- From the *Billing* worklist:
  - Right-click on the exam and select *Go to billing cockpit*. The billing cockpit window opens, and billing tasks may be completed.
  - When billing is completed for the selected exam, selecting *Accept* returns the user to the worklist. The worklist refreshes automatically.

The billing cockpit displays billing applied to the selected exam. This window is populated by *Procedures*, *Inventory*, *Medication*, *Contrast* and *ICD Billing Codes* that were documented during or after an exam. Billing actions that are performed within this window will also be displayed. When first launching the billing cockpit, all billing displayed in the *Billing Codes* window will have a status of *Pending*.

- The upper window displays:
  - Billing Codes
  - Material
  - Procedures
  - Exam Codes
  - Export
  - Print
  - Lock

- Examination Status
- Report Status
- Reports

The following actions may be performed within the billing cockpit by selecting an action icon:

- Delete
- Save
- Refresh
- Launch Report Overview dialog

The following actions may be performed within the billing cockpit by right-clicking on a billing code:

- Billing Credit
- Adding a modifier
- Do Not Bill

Once an action is performed, the status column will update accordingly.

Export billing

Billing in a pending status will be auto selected for export (identified by the check mark). While in a pending status, the quantity may be adjusted if needed.

Once pending items are ready for export, select the *Export* icon (tooltip will display number of items to be exported). The status will update to Exported.

Credit billing

Only exported billing codes may be credited. An additional manual line item will be created with the *Credit Pending* status. Manual items that have not been exported can toggle from *Pending* to *Pending Credit* until exported.

To perform a credit:

1. Right-click on the billing code that requires crediting and select the *Credit* icon.
2. If needed, adjust the credit amount to reflect the correct quantity to credit. This number will display as a positive value.
3. The quantity will default to the exported quantity.

Adding a Modifier

1. Right-click on the billing code that requires a modifier and select the *Modifiers* icon.
2. In the modifier dialog, select the green plus to add a line and select the desired modifier from the drop-down list.
3. Add additional modifiers as needed.
4. Select the *Accept* button.

Do Not Bill

Only 'Pending' billing codes may be set to 'Do Not Bill'. 'Do Not Bill' is set for items that were used or performed during the exam but cannot be billed to the patient. For example, a supply item was opened but was dropped on the floor and discarded. This item needs to be documented so that the inventory shelf count can be adjusted but is not charged to the patient. Items in the 'Do Not Bill' status can be reverted to 'Pending' in case of errors. Those items can then be exported as usual. The billing worklist will show completed on all exams that have no 'Pending' items in place.

To set an item to 'Do Not Bill':

1. Right-click on the 'Pending' billing code and select 'Do Not Bill'.
2. The status will now reflect 'Do Not Bill' and the item will not be exported to the billing interface.
3. To revert the charge back to 'Pending', right-click on the 'Do Not Bill' billing code and select 'Pending'. This charge can now be exported out to the billing interface.

Deleting a pending billing code

Only manually selected billing codes, those selected from the upper window, may be deleted. To delete a billing code with a Reference, you must delete the procedure from the examination. This prevents inconsistent data between the billing and the examination.

Only billing codes with a status of *Pending* may be deleted.

9.10 Exam Inventory

1. Click the *Inventory* button to add the material used during the exam. This is the only location in the application that displays all the material used as part of the selected examination. See Procedure Log – Material for more information on how to add material (manually, using boxes, and using a barcode scanner).

   Materials can be recorded manually to the exam via the *Inventory* button. Although it is recommended that you use the procedure log for recording and booking material items, this form can be used to check the materials that are assigned to an exam after the procedure log is completed.

   The lower table shows all material items, quantities and costs that are assigned to the exam as well as the reduction of the inventory stocks.

   To manually assign items to the exam and reduce the inventory stocks:

   - You can select the article category in the tree diagram in the left-hand pane, then search for the item in the inventory table and double-click the item to send it to the lower target table.
   - Use the *Stock Location* from the drop-down menu to assign a stock location to the item before double-clicking the item to send it to the lower target table.

   In the inventory table, the row below the column header allows you to define (and clear) filter criteria and sort articles in ascending and descending order by:

   - HIS Interface Code
   - Expiration
   - Reference Number

- Description
- Unit
- Route
- Manufacturer
- Usage End

In the target table, a new line is automatically appended to the list for each new item transferred from the upper table.

The quantity consumed (Quant. cons.) is entered with a default value, which can be edited. This is the quantity that reduces the inventory stocks.

To remove an item, highlight the row and then click the red cross button to the right of the selected article pane.

A red cross symbol then identifies items earmarked for removal from the list.

Click the red cross symbol if you decide not to remove the item.

2. Click the *Save* icon to perform the reduction of stock. Any time the quantities are changed and saved, the stock levels will reflect the changes.
3. Click the *Printer* icon to send this exam's material list to the printer.

To add a new item that does not exist in the current inventory list:

1. Select the *Define New* icon (box with a green plus).
2. Add *Article Description*, *Reference Number*, *Manufacturer* and *Size*.
3. Select the *Accept* button.

9.11 Exam Transfer

9.11.1 Initiate Exam Transfers

The *Transfer* function allows you to transfer values from Centricity Cardio Workflow to the Mac-Lab/CardioLab or other appropriate modalities, if a communication link has been established with these systems. Connectivity to external devices is not part of the standard Centricity Cardio Workflow installation and must be configured separately.

An examination can be transferred to the Mac-Lab/CardioLab systems as follows:

1. On the *Patient Information* screen under the *Exam Log* tab, either open an existing examination or create a new examination and enter the necessary details. Once the examination is saved, the *Transfer* button in the ribbon bar becomes active.
2. Click the *Transfer* button to send the examination to ALL predefined modalities.

> **WARNING:** Confirm that the correct patient is selected before clicking the *Transfer* button. Otherwise, the Mac-Lab or CardioLab will receive demographic and exam information that is incorrect.

3. If you wish to send the examination to a specific modality only, select it from the drop-down list of predefined modalities.

9.11.2 Verification of Received Exam Results

> **WARNING:** You must verify the patient data displayed on the Mac-Lab/CardioLab system. If the exam number sent by Centricity Cardio Workflow is incorrect, DO NOT change it on the Mac-Lab/CardioLab system. Instead, change the number in Centricity Cardio Workflow and transfer it to the Mac-Lab/CardioLab again.

When data is returned to the Centricity Cardio Workflow system from modality devices, the verification of exam results should take place. Due to internal processing of the data, it can take up to 30 seconds until the data is available in Centricity Cardio Workflow. To make the data visible, the forms have to be reopened to be refreshed:

1. Verify that the *Order Number* is displayed on the Mac-Lab/CardioLab. If no order number is displayed, enter it manually. The order number corresponds to the Centricity Cardio Workflow exam number. Select the correct procedure type for the planned study selected on the main screen.
2. If the *Pre-Register* button on the Mac-Lab/CardioLab is used, only patient demographic information is sent to the Mac-Lab and the Order Number will not be used within Mac-Lab. Check that the *Pre-Register* button was not used and that the order number is shown.

3. Results from Mac-Lab/CardioLab cannot be assigned to Centricity Cardio Workflow if the patient information such as Last, First, Middle Name, and MRN does not match. Verify that this information has not been changed.
4. If the Mac-Lab/CardioLab or its configuration changes, the responsible GE Healthcare engineer must be notified immediately. Do not use the interface until you have discussed the configuration changes that might be necessary.
5. Check the measured values sent by the device (such as hemodynamic values).

10 Procedure Log Form

The Procedure Log provides a time-stamped chronological log of all activities that take place during a procedure, starting with pre-procedure assessment details through intra procedure Cath details, to post-procedure details.

The Procedure log is only supported in the Cath, IPV, CRM Implant, EP, and STRHEART modes.

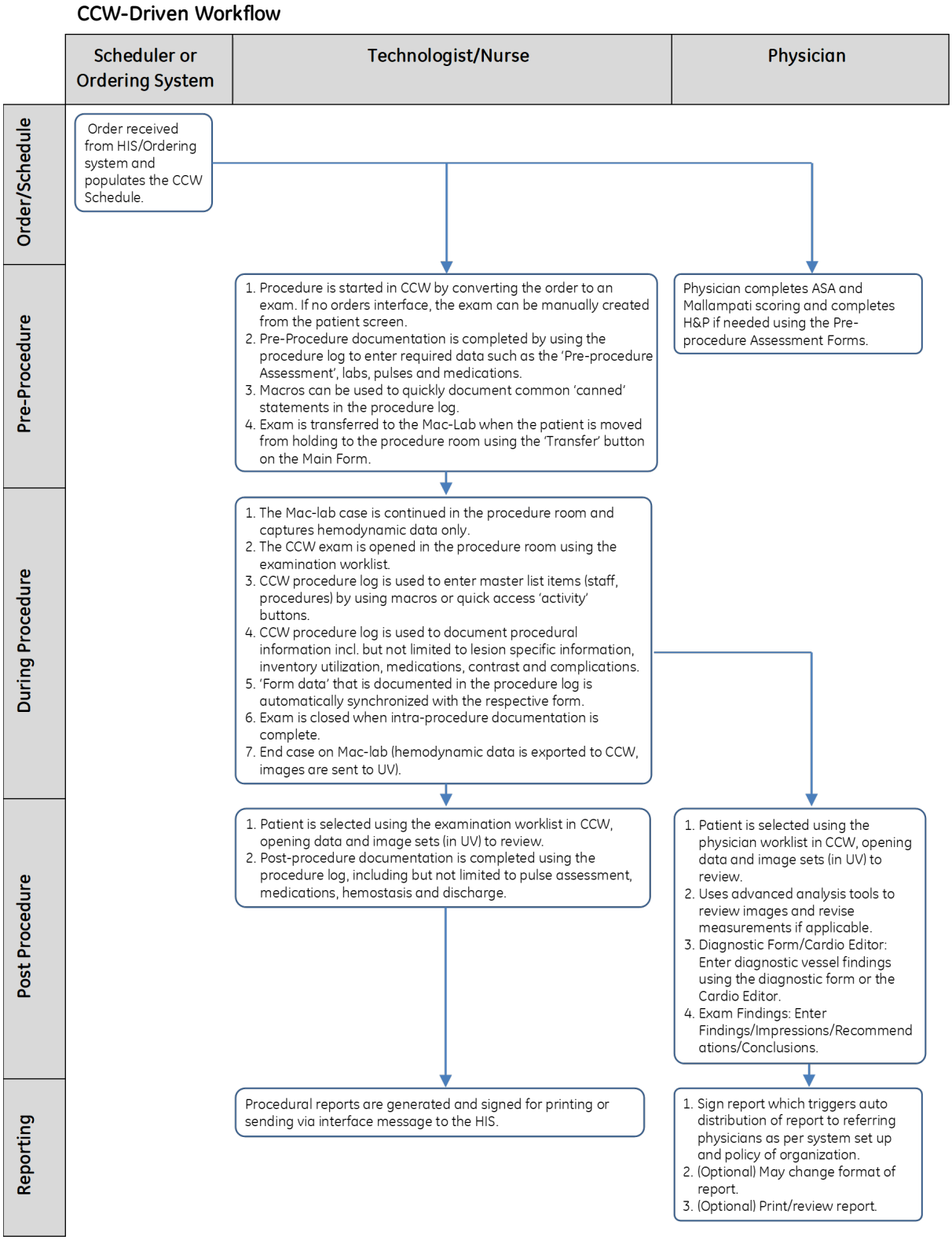
With CCW and Mac-Lab integration, measurement data collected by Mac-Lab automatically populates the procedure log as well as the relevant diagnostic and intervention forms. Macros can be configured to streamline the documentation and automate sequential steps, providing a user-friendly method to enter exam detail.

With CCW and third-party Hemodynamic recording systems integration, textual data will not automatically populate the procedure log. Macros can be configured to streamline the process and automate activity steps in a user specified order.

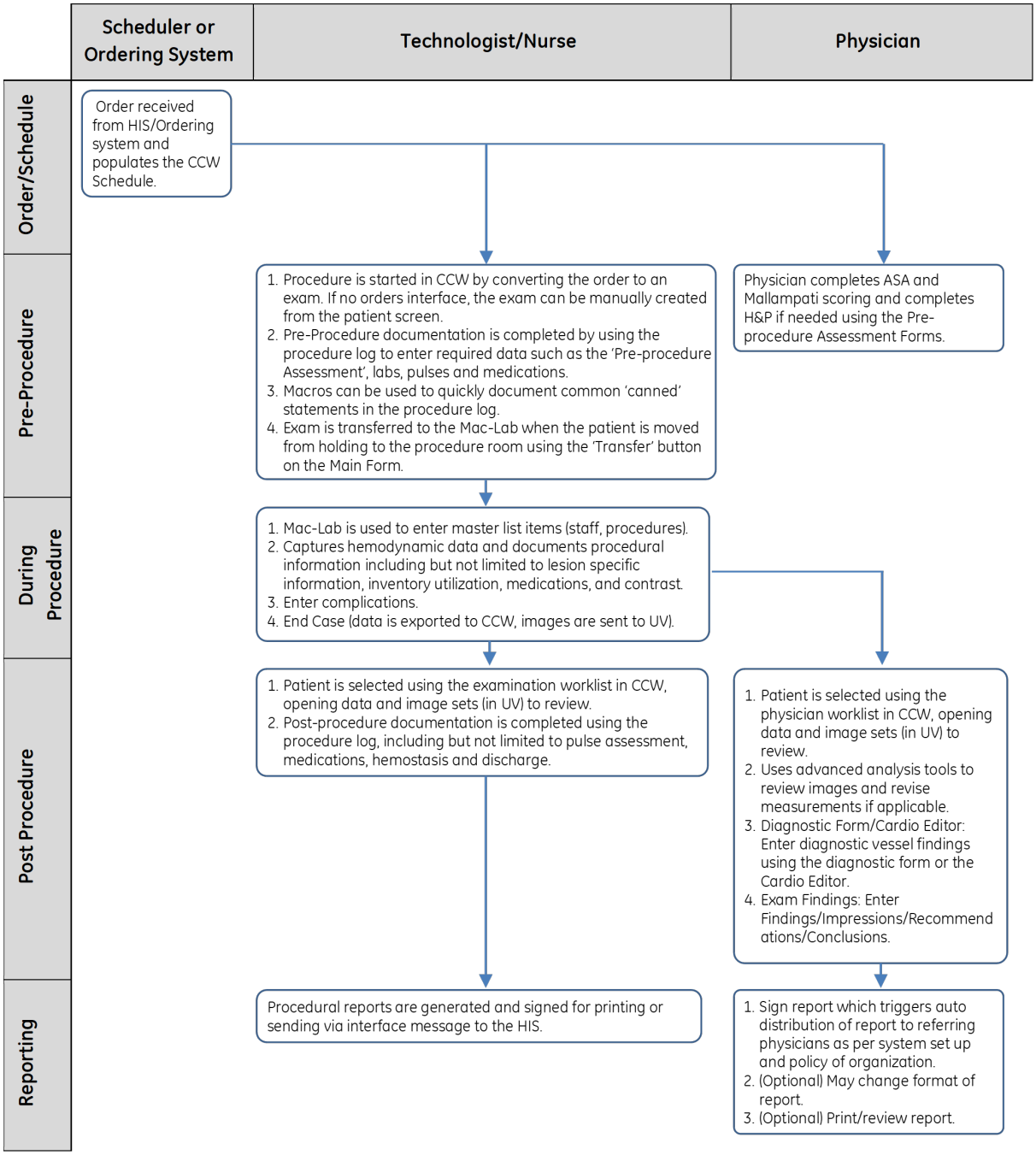
You also have the option to manually enter activities into the procedure log anytime during the exam.

See the workflow charts on the following pages for detail.

10.1 Procedure Log Workflow Charts



CCW Pre- and Post-Procedure, Mac-Lab Intra-Procedure Workflow



10.2 Procedure Log Detail

To access the procedure log:

1. Select the patient and open the exam (exam is automatically created when order is downloaded and started in the Mac-Lab).
2. Select the *Procedure Log* form.

10.2.1 Overview

The dialog consists of four panes:

- An activity button pane that allows you to manually add procedure log detail during the exam. In case of a macro driven workflow, the activity buttons allow additional detail entry.
- The macro pane displays a list of macros. These are pre-configured sequences that may fill commonly used details during a procedure and streamline the process of data entry. Please ask your system administrator if there should be the need for the configuration within an existing macro, or an additional procedure log macro.
- The log pane provides the collected information with the date/timestamp, the icon for easy visualization of the procedure detail displayed, the activity type for the log entry, if applicable the vessel examined (for diagnostic and interventional log detail), and the description of the log detail inclusive measurements (if present).
- The activity entry detail pane allowing you to add detailed information for the selected activity or edit existing logged detail.

Pane Control in the dialog

Each individual pane header displays several icons that enable basic controls for the positioning of the pane.

1. The downward arrow icon accesses a submenu to control pane positioning:
   - ***Floatable*** - Click *Floatable*, then drag the pane header to the desired position within the display limits.
   - ***Dockable*** - Click *Dockable*, then drag the pane. Directional markers will appear within the main dialog and when lined up with the cursor, the pane will dock to the selected side of the dialog.
   - ***Auto Hide*** - Click *Auto Hide* to minimize the pane when it is not in focus. This is only available when the pane is docked in the dialog.
2. The *Pin* icon allows you to auto-hide the pane.
3. The *X* is disabled.

10.2.2 Reset the Procedure Log Layout

The Procedure Log Layout allows you to reposition and dock individual panes within the application window, and the panes will stay in the selected position after exiting the dialog.

If you have moved the panes and would like to reset the layout to the default setting:

1. From the examination ribbon bar of the *Procedure Log* form, click the *Reset Procedure Log Layout* button.
2. Click *Yes* to confirm. This action is not reversible.

10.2.3 Button Controls in the Dialog

The activity buttons listed in the left-hand pane will open a dialog to enter procedure specific detail into the Procedure Log. Each of the activities will have a date/timestamp entry into the log.

If the timestamp of an individual procedure log entry is edited, the entry will be moved into the sequentially correct spot. The following activity buttons are available:

Icon	Description
	Exam Start allows for the entry of the case/procedure start date and time, as well as a comment.
	Staff allows the entry of staff duty and staff name. Also, the entry and exit time of the staff can be documented, calculating the duration of the presence of the staff member. A comment can be added as well.
	Case Event allows the entry of the case event type, selection of the staff, the time of the event start, and a comment line.
	Material opens the inventory dialog. The dialog may stay open during the exam for easy access.
	Access allows entry of access type details e.g. the vessel accessed, as well as tabs for Hemostasis, Sheath and Catheter Placement detail.
	Transseptal Access allows the entry of Transseptal Access data. This activity type is only available for EP and Structural Heart examinations. The data entered for this activity will remain synchronized with the data entered on the *Transseptal Access* form and vice versa.
	Procedure allows for the selection of the procedure type and a comment line.
	Supplies/Exchanges allows the entry of Supplies and Exchanges. This activity type is only available for Structural Heart examinations. The data entered for this activity will remain synchronized with the data entered on the *Supplies/Exchanges* form and vice versa
	Diagnostic/Venogram selection displays a list of available vessel types. Following the selection, the appropriate detail pane opens for entry.
	Intervention allows the entry regarding lesion, treatment and supplies. The choice of treatment will determine the availability of subsequent fields e.g. attempts and pre- or post-stenosis percentage. Parallel intervention can be initiated in this location (see section Parallel Intervention)
	Treatments allows the entry of different treatments, depending on the exam mode. The data entered for this activity will remain synchronized with the data entered on the related forms and vice versa.
	Complication allows the complication selection from the catalog, and a comment line is available.
	Comment allows the predefined comment selection for data selected from the catalog. A line for free text can be entered.

Icon	Description
	Exam End allows the entry of the data/time stamp determining the end of the case.

10.2.4 Control in the Log Pane Dialog

Selecting any line in the Procedure log pane will open the appropriate dialog and changes can be made if needed.

Right-clicking and entry in the Log pane will open a selection menu:

- ***Case Event*** - Case event type.
- ***Insert a New Activity*** - Provides a list of available activities (same as in the activity pane except the case start/end).
- ***Remove an Activity*** - Inserts a mark in front of the selected log entry, and with the subsequent click, the line in the log is removed.
- ***View Log History*** - Provides a log of actions that were executed during the procedure, e.g. an insertion of an activity.

10.2.5 Parallel Intervention

In some cases, two interventions are performed at the same time. A common example is the Kissing Balloon.

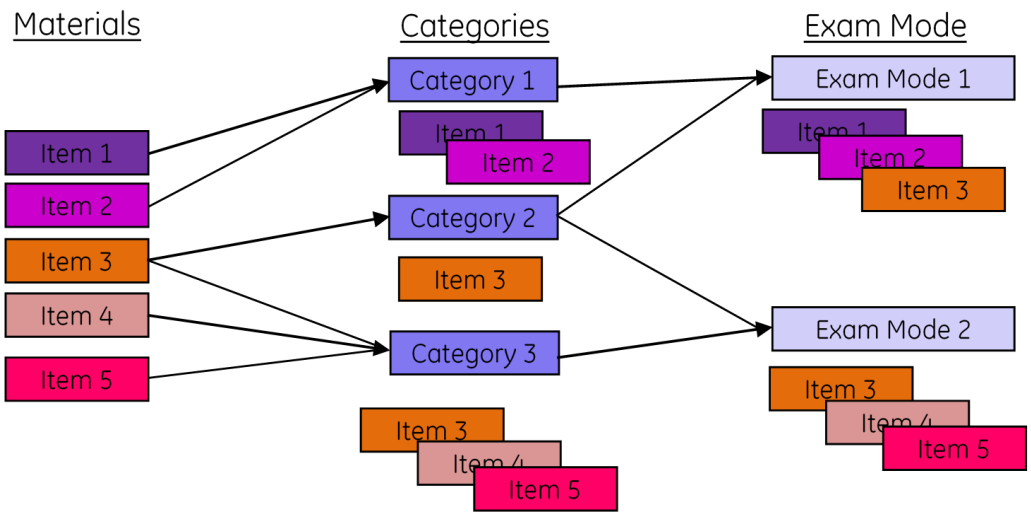
1. In the Procedure Log activity pane with the first intervention dialog open, click the sign to open the catalog and select the lesion.
2. Enter the treatment from the catalog.
3. Select the Supplies from the Inventory list.
4. The button is now active. Click to open a second intervention dialog below the first one.
5. Enter the details for both interventions as needed.

10.3 Procedure Log Material Overview

Materials are available to the Procedure Log of an exam mode in one of two ways:

Procedure Log Material Categories

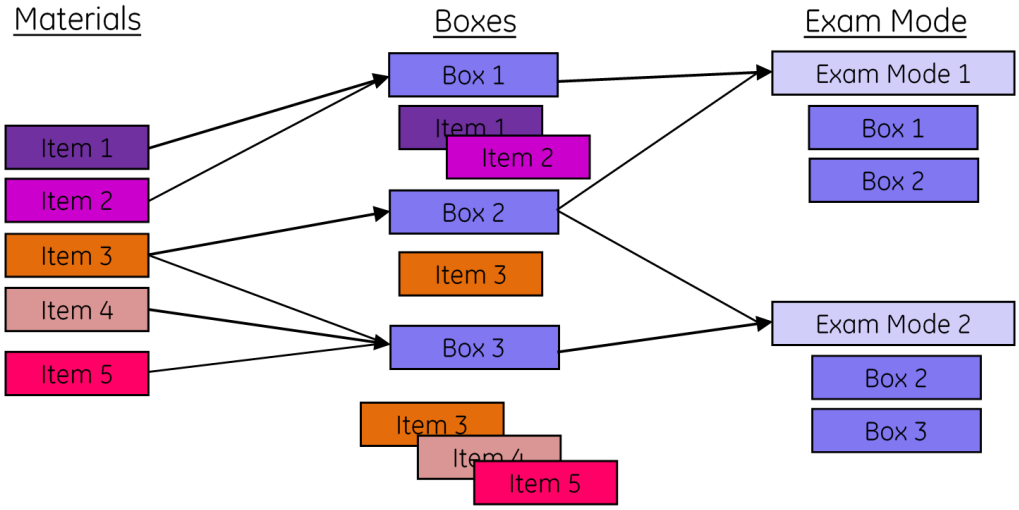
Individual material items are available for selection in the exam Procedure Log.



This category is used for ML/CL IT list management of supplies. Only items documented into a category and designated to an exam mode that is list sharing with ML/CL IT will be included as a list item.

Procedure Log Material Boxes

Bundled boxes (Inventory Boxes) are available for selection in the exam Procedure Log. If no boxes or categories are designated, all are available to the exam mode.



10.4 Procedure Log – Material

The *Material* button on the *Procedure Log* form allows you to record material used during the procedure. You can enter material manually or use a barcode scanner to scan the material and have the system enter the material automatically.

10.4.1 Manual Recording

1. Select the material category by clicking a category in the tree diagram in the left pane. All material items assigned to the selected category are displayed in the right pane.
2. Double-click the needed material from the right pane; this sends the material with a time stamp to the Procedure Log.
3. If the actual quantity/dose differs from the default value of 1, change this value in the Procedure Log form in the *Quantity/Dose* field (the item's units are displayed as specified in the inventory).
4. In addition, the *Access*, *Infusion*, *Duration*, *Serial Number* and *Lot Number* data fields can be changed for every material item entered into the Procedure Log.
5. If recording an ICD, Pacemaker or Lead, document the serial number at the time of material selection (prior to saving) for the serial number to populate the *CRM Implant 'Manage Devices/Leads'* dialog.
6. If the item that is being documented does not exist in the current inventory list, select the *Define New* icon in the material window (box with green plus).
7. Add item details and select the *Accept* button.

The material that is recorded at this point refers to the current exam only.

If defined in the inventory, *Lot No.* and *Serial No.* are transferred to the log.

If a serial and/or lot-controlled article is used in a procedure log or exam material, a dialog box is displayed so you can choose the article from the list (if necessary, you can also use the item without selecting it from the list by clicking the *Ok* button and entering the serial/lot information later).

It is possible to enter a serial/lot number that is not currently in stock. You are asked if the item should be used anyway. A message box with *Yes*, *Yes, ignore error* and *No* appear. *Yes* transfers the item without serial/lot number into the log, and in the exam's material log, the item will have a yellow exclamation mark; *Yes, ignore error* transfers the item without serial/lot number into the log, and in the exam's material, the item will not have a yellow exclamation mark.

If an article with a serial and/or lot number is used in a procedure log or exam material and the number does not exist in the material database, the number can be entered anyway, the article will be saved in the procedure log, but the article will not decrement the inventory stock level.

Infusion rate is defined in the inventory and cannot be edited (like the unit).

If an inventory item is defined as a total volume, the *Consumption* data field displays the consumed quantity of the total volume, e.g. 1 bottle can contain 100ml, then the item is entered into the log using the unit ml. If 10ml are entered into the log, the related consumption is 0.1 (bottles).

You will get a warning message if an expired article is used in procedure log/exam material. If you select an item with an expiration date, and there is the same item with an earlier expiration date, you will also get a warning message.

The form for the recording of material and the main form of the Procedure Log can be displayed simultaneously, as long the Procedure Log is not closed. You are then able to switch to material recording via the taskbar or by clicking directly in the *Material* form.

10.4.2 Use Boxes

1. Select a box from the *Inventory Box* drop-down list. The corresponding box items will appear in the table below.

2. Double-click the appropriate box item to send the material to the Procedure Log.
3. If the actual quantity/dose differs from the default value of 1, change this value in the Procedure Log form in the *Quantity/Dose* field (the item's units are displayed as specified in the inventory).
4. In addition, the *Access*, *Infusion*, *Duration*, *Serial Number* and *Lot Number* data fields can be changed for every material item entered into the Procedure Log.

10.4.3 Stock Location

To restrict the number of listed items to a specific stock location:

1. Select a *Stock Location* from the drop-down menu.
2. Search for the item in the inventory table.
3. Double-click the item to send it to the target table.

10.4.4 Use Barcode Scanner

If barcodes will be used for recording exam material, a barcode scanner must be connected to the PC (not included in the standard Centricity Cardio Workflow equipment) and the barcodes must be maintained by the system administrator. For programming the scanner, refer to the scanner's user manual.

Be aware that barcodes are not unique. Different providers may use the same codes for totally different materials, since there is no general standard for assigning barcodes. It is unlikely you will encounter this situation, but it is useful to remember that there may be a conflict. The scanner reads a barcode and transmits a matching sequence of characters to the USB port of the PC. The result is exactly the same as if you entered the characters manually. When the item is scanned, the list of items in the database is searched for a matching code. If there is an article with a matching barcode, the item is transferred automatically to the Procedure Log and you may adjust the quantities if needed.

1. Scan the material item. Please contact your system administrator for scanner programming.
2. If the actual quantity/dose differs from the default value of 1, change this value in the Procedure Log form in the *Quantity/Dose* field (the item's units are displayed as specified in the inventory).
3. In addition, the *Access*, *Infusion*, *Duration*, *Serial Number* and *Lot Number* data fields can be changed for every material item entered into the Procedure Log.
4. If the barcode is not found, you will be allowed to enter the item as 'New' by selecting the *Define New* button in the *Item not found* dialog. The barcode field will be pre-filled based on the barcode scanned.

10.4.5 After the Procedure Log is Completed

Click the *Material Booking* button. The *Record Material* window then displays all material items that have not been recorded or booked from inventory yet. All listed material items are booked by default. It is possible, however, to exclude specific materials by deselecting the corresponding checkboxes and editing the consumed quantities. The consumed quantity (*Quant. Cons.*) is the amount that is required

from inventory, while the medical quantity (*Quant. Med.*) is the amount that was actually used for the patient. This does not affect the Procedure Log.

The booking of material is configurable, and for US installations is configured to auto-book by default.

10.5 Case Resolution

Case resolution is available for invasive exams allowing you to associate procedures, medications, complications, and inventory items to a case event and/or physician. This enhances the ability to acquire statistical data by physician as well as case type. Case resolution can be done within a patient exam or from the case resolution worklist.

10.5.1 Case Resolution within a Patient Exam

1. Navigate to the *Procedure Log* tab.
2. Select the *Case Resolution* button on the ribbon bar.
3. Create a new case event, if desired, by selecting the *New Case Event* button.
    - Select Case Event type
    - Select the physician assigned to that case event
    - Set Case Event Start date/time
    - Set Case Event End date/time
4. To edit the current case event, double-click on the case event to open the dialog.
5. Drag and drop a single item or multiple items from one case event to another if needed.
    - For example: A balloon catheter was mistakenly associated to the Diagnostic Cath case event. Simply highlight the balloon catheter and drag it into the Interventional Cath case event.
6. Lock or unlock case resolution. Once case resolution is locked, the CCW procedure log and case resolution are locked against further updates from the Mac-Lab or CardioLab systems.
7. Select the *All Studies* button to view CCW confirmed reports or Mac-Lab/CardioLab procedural reports.
8. Select *Accept* when finished.

10.5.2 Case Resolution from the Case Resolution Worklist

Case resolution can be done for multiple patients at one time from the case resolution worklist, without having to open each individual exam.

1. Select multiple exams, if desired.
2. Right-click and select *Go to Case Resolution*.
3. The *Case Resolution* window gives you the ability to create new or modify current case events.
4. Drag and drop items into appropriate case event.
5. Lock or unlock case resolution.
6. View reports and continue to work in the case resolution window while reports are open.

7. Save current data and then switch directly to the next exam.
8. Or simply save and close.

11 Detailed Exam Forms

When you create a new exam in the *Patient Information* screen or open an existing exam, the appropriate exam forms are provided in the respective exam screen. You can display the exam forms for editing by clicking the form title in the navigation tree.

The contents of a detailed exam form always refer to the central exam form from which it was invoked.

Based on the exam mode selected for the central exam form, Centricity Cardio Workflow only provides the detailed exam forms that are assigned to that exam mode. For example, if CATH is the exam mode, detailed forms necessary to record data that occurs in the course of a cardiac catheterization appear.

Centricity Cardio Workflow does not require that all fields be filled out on detailed exam forms. If a value in the form or table is required but missing, then that form will be displayed with an orange-colored stripe in the navigation pane. In the form, the required field will be displayed with an orange-colored background. The remaining fields are optional from a technical point of view, but still users are supposed to fill these according to the workflow requirements of the site. If in doubt, please consult your local administrator.

11.1 Key Image/Waveform Archive

Key Image/Waveform Archive Overview

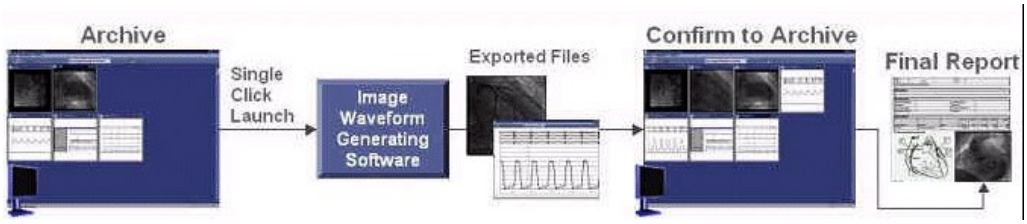
The Centricity Cardio Workflow Image and Waveform Archive is a repository of clinical images or waveform records associated with a patient examination. This archive provides a comprehensive data and image physician review stations with the Universal Viewer, CA1000, or 3rd party Imaging Workstation Convergence Stations.

Image and Waveform Archive

Use the Centricity Cardio Workflow examination record to additionally archive clinical images and monitoring waveform snapshots. Files are reviewed at any Centricity Cardio Workflow workstation, available for the report, and archived for long-term patient record integrity.

The Image and Waveform Archive form can be associated to any Centricity Cardio Workflow examination mode (Cath, Echo, etc.) Per Centricity Cardio Workflow workstation, the archive can launch any image or waveform-generating program for the purpose of adding new files to the archive. This is a simple launch with no data transfer between Centricity Cardio Workflow and launched software.

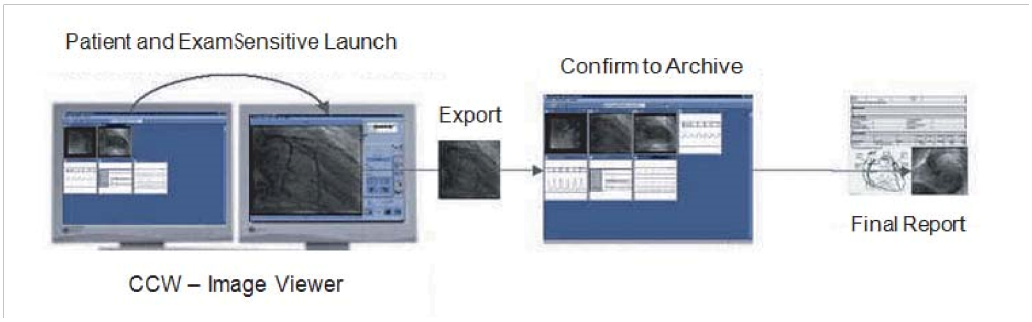
The image or waveform-generating software can be utilized to create new files for the archive and are saved to a workstation folder directory. Once the launched software is closed, Centricity Cardio Workflow will scan the directory and regular Centricity Cardio Workflow continues. Archive files are manually confirmed into the archive. There is a wide range of file types that can be incorporated into the archive including: BMP, JPG, TIF, AVI, DOC, etc.



When purchased with the archive, the Mac-Lab-CardioLab system interfaces auto-populates the archive with snapshots of waveforms, images captured and reports.

Image Convergence Workstations

Centricity Image Convergence Workstations can be purchased to act as an automated and interactive tool for image review - especially useful during the physician reporting process. Available workstations include the CA1000 and 3rd party workstations.



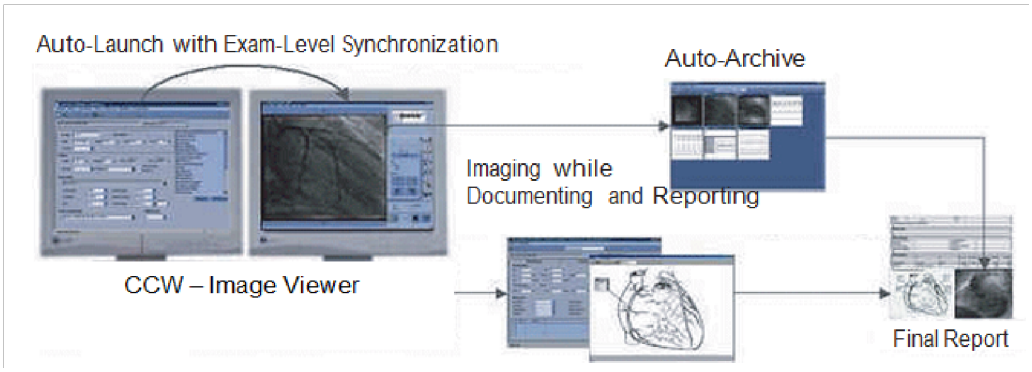
With GE Image Viewer applications (Universal Viewer, CCI and Centricity CA 1000):

Automated Image Launch - Selecting a Centricity Cardio Workflow examination will auto-launch the corresponding exam images. Image types supported include CR, CT, DX, MR, NM, US, XA, and others. Changing patient examinations in Centricity Cardio Workflow will similarly automatically resynchronize GE Viewer application.

Independent Working with Automated File Archive Assignment - Physicians can independently navigate through the GE Viewer application for detailed image review or through Centricity Cardio Workflow for database or report population. Any image files that are exported by the image viewer application will be auto-assigned to the Image and Waveform Archive without the need for manual confirmation via a regular archiving routine.

The synchronization and automated archive routine can communicate the following items. In general, this can be configured to check or ignore the following patient identifiers:

- Patient ID
- Patient Name
- Patient Date of Birth
- Exam ID (Accession)
- Study Date
- Study Time



Key Image/Waveform Archive Form

The *Key Image/Waveform Archive* form is used to display key images and/or waveforms sent by the individual modalities to this application. These images can be opened for review, and also non-image attachments can be added at this location. Images can also be used for visualization purposes in the Cardio Editor, which can be accessed from the *Key Image/Waveform Archive* form.

1. From the exam main form, open the *Key Image/Waveform Archive* form by either clicking the respective tab or by choosing it from the drop-down list on the left-hand side of the ribbon bar, or by choosing it from the drop-down list on the right-hand side of the tabs.
2. When the *Key Image/Waveform Archive* screen opens, and if there are images or other files associated with this examination, they will be listed in the screen. Double-click on any image/waveform to open it for display.
3. To add attachments to this location, click the *File* icon. Locate the file and click *Open*. The file is added to the archive.
4. If you want to delete any image/waveform from the archive, highlight the desired file and click the *Delete* icon.
5. If you want to filter the list of displayed files in any way, click *Filters* in the ribbon bar and choose the type of documents you want to have listed.

Web Forms

The Web forms allow you to display patient records through an Internet interface. You can access the web forms through the *Patient Information* screen or, if configured, through the *Examination* screen.

From the *Patient Information* screen:

1. From the *Patient Information* screen, select the desired patient.
2. When the information for that patient is displayed, click the *Web* button in the ribbon menu.
3. When the drop-down menu appears, select one of the available web forms, e.g.
    - Centricity Enterprise Web
    - Centricity CV Web (XI)
    - Centricity CV Web (Muse)
    - Centricity CV Web (IMS)
    - CardioSoft Web
4. From the *Examination* screen, if configured, open the available tabs for web forms, e.g. the CardioSoft or MuseWeb web, by either clicking the respective tab or by choosing it from the

drop-down list on the left-hand side of the ribbon bar, or by choosing it from the drop-down list on the right-hand side of the tabs.

5. The URL field defaults to http:/cardio1/<patient name> for CardioSoft Web or http:/muse1/muse/<exam number> for MuseWeb. However, this default URL can be modified by your system administrator.

11.2 Measurements

Use the *Measurements* form to record anatomy values and can be associated to any exam like Echo and Pediatric Echo.

- Measurements added from within CCW are identified as "User Defined" and labeled with a purple square, and any measurements coming from modalities/devices are identified as "Device/Review Station" and labeled with a blue square. Any measurement coming from a modality/device can be changed in CCW, but its label will still remain blue.
- Click the *Add* button to add new measurement values. In the *Add Measurements* dialog, selecting a value from the *Anatomy* drop-down list populates the *Mode* drop-down list, and selecting a value from the *Mode* drop-down list populates the *Field* drop-down list. You can then define the value of the measurement and decide if the measurement should be added to the table, conclusion and/or report. Checking the *Conclusion* checkbox automatically checks the *Findings* checkbox as well. If the selected Report Template is configured to include the measurement history graph, the *Graph* checkbox allows you to add history graphs to the report for each measurement value.
- Highlight a value in the table and then click the *Edit* button to edit measurement values. Changes will be saved automatically after closing the *Edit Measurements* dialog. Calculated fields will be updated when the related measurement value is updated.
- Right-clicking on any value field displays the option *Show History* to view the history of that measurement field. The left-hand side of the measurement field history dialog lists the historical data and the normal range (if applicable).

  The right-hand side includes a visual representation of the historical data:

  - *Show Line* - Connects the data points in the graph. If unchecked, the graph hides the line and show only the points.
  - *Show Normal Range* - If a field is configured to have a normal range, then the measurement graph displays the normal range in green. If unchecked, the graph hides the normal range.
  - *Show Mean and Min & Max ranges* - For Detroit/Boston Z-Score fields, the measurement graph displays the mean value and the min & max ranges. If unchecked, the graph hides the mean value and the min & max ranges.
  - The date range is configurable.
  - For Detroit/Boston Z-Score fields, there is an option to plot the measurements over the BSA.
  - For Boston Fetal Z-Score fields, there is the option to plot the measurements over the GA (LMP) (Gestational Age last menstrual period). The x-axis is fixed from 10 to 40 weeks.
  - Zooming in and out of the graph is possible by scrolling with the mouse wheel or clicking and dragging the ends of the horizontal and vertical scrollbars.

- The options *Show Line* and *Show Normal Range* (or *Show Mean and Min & Max ranges* for Detroit/Boston Z-Score fields) are always enabled for the chart in the report.

- When a value in the table is out of the normal range of values defined for the respective field, the background color of the field will change to yellow to indicate clinically abnormal data.

12 Worklist

This section describes elements of the *Worklist* screen including how to use the filters and perform required actions from the worklist.

12.1 Access the Worklist Screen

Worklists allow convenient filtering of the Centricity Cardio Workflow data pool to perform a number of tasks.

You can access the *Worklist* screen by clicking *Worklist* from the landing page or opening the main *Menu* and clicking *Worklist*. During a session, the worklist will keep its current appearance when you work in another screen.

12.2 Select a Worklist

The *Worklist* button on the left-hand side of the ribbon bar indicates the currently displayed worklist. To choose another worklist:

1. Click the down arrow on the right-hand side of the *Worklist* button to open the drop-down list of worklists.
2. In the drop-down list, select the required worklist. The worklist table will be displayed.
3. Selecting a row in the current worklist opens a details pane at the bottom of the *Worklist* window to provide detailed information about the selected row.

Ask your administrator if you need additional worklists.

12.3 Sort and Filter the Worklist Table Manually

The worklist has a header for each column, such as *Last Name*, *First Name*, etc.

1. To sort the table according to a specific column, click the column header (not the white input field). Clicking the column header again will toggle the sorting between ascending and descending order, indicated by an upward or downward arrow in the header.
2. To filter the worklist, enter criteria in the input fields of the respective header, the list will be filtered according to your inputs.
3. To have the complete list displayed again, press the *Clear column filter* button in the *Refresh options* ribbon to clear all column filters. For removal of individual column filters, clear the header input fields.

The columns and headers are predefined for the currently displayed worklist. Ask your administrator if you need additional columns.

12.4 Sort and Filter the Worklist Using Predefined Filters

A worklist may be configured with predefined filters. To apply a predefined filter:

1. Click the down arrow on the right-hand side of the *Filter* button to open the drop-down list of predefined filters.
2. In the drop-down list, click the filter you want to apply.

Ask your administrator if you need additional filters.

12.4.1 Worklist Filter Sort Order

Worklist filters can be sort ordered to meet your needs. The sort ordering of filters is a global configuration.

To sort order an existing worklist filter:

1. Select the worklist and worklist filter.
2. Select *Edit filter*.
3. Under the *Main configuration* tab, enter a numerical value in the sort order field.

   The sort ordering numbering configuration is the same as the sort ordering configuration performed in catalogs. Recommended: Numbering by 10's.

To sort order a new worklist filter:

1. Select the worklist.
2. Select *New filter*.
3. Under the *Main configuration* tab, enter a numerical value in the sort order field.

   The sort ordering numbering configuration is the same as the sort ordering configuration performed in catalogs. Recommended: Numbering by 10's.

12.5 Perform Required Actions from the Worklist

1. Right-click the worklist row you want to work on.
2. From the context menu, choose the kind of action you want to perform, e.g. *Go to Patient*, *Go to Exam*, etc.
3. If available in the context menu, selecting *Copy to Clipboard* will allow you to copy selected patient information to your clipboard, including:
   - Patient Name
   - MRN
   - Admission
   - DOB
   - Procedure Date
   - Mode

The context menu is predefined for the currently displayed worklist. Ask your administrator if you want your context menu changed.

13 Cardio Editor

The Cardio Editor provides a set of tools to visualize diagnoses or interventions using either any kind of picture obtained from imaging modalities (painting mode) or schematic representations of the heart (schematic mode).

13.1 Accessing Cardio Editor

Depending on the type of examination, the Cardio Editor can be accessed from the *Examination* screen.

1. On the *Patient Information* screen, click the *Exam Log* tab and either open an existing examination.
2. The Cardio Editor icons will appear in the exam functions toolbar. Either click the *Painting Mode* or the *Schematic Mode* icon to start the respective mode.

13.2 Cardio Editor – Schematic Mode

The schematic mode provides a schematic representation of the vessels of the body. On this scheme, you can mark diagnoses and interventions for each vessel or section of a vessel.

The schematic mode of the Cardio Editor is based on predefined vessel schemes. These schemes can be created and modified by the administrator. If there is no vessel scheme available for the type of examination or intervention you want to visualize, you will receive a respective message. You can ask your administrator to provide an applicable scheme.

The original schemes will not be altered but copied when saved or exported to the key image archive.

13.2.1 Toggling between the Diagnostics and Interventions Lists

Diagnostic and intervention data are listed in the right dock of the Cardio Editor window as soon as they are created.

- Toggle between diagnostic and intervention lists by clicking the *Diagnostics* or *Interventions* button at the bottom of the *Diagnostics and Interventions* dock.

13.2.2 Marking and Editing Diagnostic Data in the Scheme

You do not need to fill in all data or text fields provided by the different windows in the Cardio Editor. If there are mandatory fields, you will receive a message.

1. In the exam functions toolbar, click *Schematic Mode*.
2. In the ribbon bar in the *Choose Schema* section, choose one of the available schemes, e.g. *Left Dominant*, *Right Dominant* or *Carotid* from the drop-down menu to display the respective scheme.
3. If necessary, use the zoom function in the ribbon bar for a closer view of vessel sections. If the scheme no longer fits the screen after zooming in, you can use the scroll bars or click and drag with your mouse to navigate around the scheme.
4. Right-click on the desired vessel section.

5. From the right-click menu, choose one of the following menus: *Vessel Properties*, *Stenosis*, *Graft*, *Collateral Flow*, *Bifurcation*, *Existing stents*, *Treatment* or *Comment*.
6. The chosen menu window opens. The window is specific to the type of menu you choose. The window allows for in-depth specification of a vessel, sometimes by means of more detailed sub-windows.

   In this window, enter the details of the vessel in the respective field(s). Most fields provide drop-down lists to choose from; if you enter text instead, the program will try to match the appropriate input.
7. Click the *Accept* button to close the menu window and save the inputs or click *Cancel* to discard your inputs.
8. The vessel data will be listed in the *Diagnostics and Interventions* dock. At the same time, the vessel section the information applies to will be marked in the scheme with an Info Box next to it.
   - If no graphical representation of the diagnostic data is displayed in the scheme, make sure the *Show Diagnostics* checkbox in the ribbon bar is selected and the scheme is correctly chosen in the ribbon bar.
   - If both diagnostic and intervention data is specified for the same vessel or vessel section, the intervention data is displayed on top of the diagnostic data; clear the *Show Interventions* checkbox in the ribbon bar to see the underlying diagnostic data marking in the scheme.
   - The colored marking in the scheme will always apply to the whole vessel or vessel segments defined in the menu window. It is not interlinked with any numerical data, such as Lesion Length, for example.
9. To alter the marked section of the vessel to match more precisely your diagnostic data, simply drag the handles at the ends of the colored marking with your mouse.
10. To view additional vessel properties in the Info Box, click on the stenosis value or treatment to expand the info box. To move the Info Box in the scheme, drag it to the required place by its header area.
11. To alter the details of the diagnostic data, either double-click on the vessel or vessel segment in question or right-click the Info Box in the scheme or the entry in the *Diagnostics and Interventions* dock and choose *Edit*.
12. To delete vessel diagnostic data, either right-click the Info Box in the scheme or the entry in the Diagnostics and Interventions dock and choose *Delete*.
13. To hide the Info Box in the scheme, either right-click the respective Info Box in the scheme or the entry in the *Diagnostics and Interventions* dock and choose *Hide Info Box*.
14. To hide individual details within an info box, right-click on the detail in question and select *Hide Item*.
15. To display a hidden Info Box in the scheme, right-click the respective entry in the *Diagnostics and Interventions* dock and choose *Show Info Box*.

13.2.3 Marking and Editing Diagnostic Data in the Scheme - Legacy Mode

The Cardio Editor can be configured to work similar to the schema editor in the legacy Carddas system. When this mode is enabled, certain steps in the Marking and Editing Diagnostic Data in the Scheme section above will differ. Check with your system administrator for details on enabling this functionality.

1. In the exam functions toolbar, click *Schematic Mode*.
2. In the ribbon bar in the *Choose Schema* section, choose one of the available schemes, e.g. *Left Dominant, Right Dominant* or *Carotid,* from the drop-down menu to display the respective scheme.
3. Right-click on the desired vessel section and choose one of the following menus: *Vessel Properties, Stenosis, Graft, Collateral Flow, Bifurcation, Existing stents, Treatment* or *Comment*.

   OR

   Select one of the commonly-used diagnostic event toggle buttons in the ribbon bar, either *Stenosis*, *Stent*, or *Graft*, and left click on the chosen vessel point. The insertion pointer will be placed at the exact location you click on.
4. Individual menu boxes will open for chosen diagnostics and interventions. Legacy mode allows you to enter the details of the vessel in the respective field(s) directly on the box (rather than in a separate window).

   Other features to note in legacy mode include the ability to delete a diagnostic/intervention directly from the box (rather than from the right-click context menu) and a connector link, which moves with the box and provides a constant reference to the exact location within the chosen vessel.

   Switching between schemas may reset the position of the diagnostic/intervention boxes to a default location in the middle of the chosen vessel.

13.2.4 Refreshing the Scheme

To return to the last saved version of the scheme, click *Refresh* in the ribbon bar. If there are any unsaved changes, you will be asked whether you want to save your inputs.

13.2.5 Printing the Scheme

To print your scheme, click *Print* in the ribbon bar and choose from the drop-down menu whether you want to print the background, interventions, diagnostic or full content image. The *Print Images* window will open and allow you to select the images to be printed and choose between several print layouts.

13.2.6 Exporting a Scheme to the Key Image Archive

To create a file including your edits that can be used for any purpose:

1. Click *Export to Key Image Archive* in the ribbon bar. The *Export to Key Image Archive* window will open
2. Select the checkbox next to the scheme or schemes you want to export.
3. Select *Overwrite linked item(s) in the key image archive?* if you want to discard former saved versions of the scheme.
4. Click *Done* to export the scheme or schemes.

13.2.7 Marking and Editing an Intervention in the Scheme

You do not need to fill in all data or text fields provided by the different windows in the Cardio Editor; if there are mandatory fields, you will receive a message.

1. In the ribbon bar in the *Choose Schema* section, choose one of the available schemes, e.g., *Left Dominant, Right Dominant* or *Carotid* from the drop-down menu to display the respective scheme.
2. Right-click on the vessel or vessel segment in question and select the *Treatment menu* item.
3. The *New Intervention* window opens. Enter the details of the intervention in the respective field; most fields provide drop-down lists.
4. In the *Intervention* section of the *New Intervention* window, specify the type of intervention, whether the intervention is a primary one or not, and whether the intervention was successful.
5. To edit a lesion, double-click on the vessel section and add desired details.
6. If you want to specify supply materials used in the intervention, in the supply section of the *Intervention Procedure* window click the *Add* button. Only items used in the exam will appear in the description drop-down list for selection. Click the *Description and Usage* fields and choose items and usage from the respective drop-down lists.
7. If the item you used is not in the drop-down list, close the *Intervention Procedure* window and select the *Inventory* ribbon item. Select the inventory item and save. This item will now appear in the *Description* drop-down list of the *Intervention Procedure* windo
8. To remove a supply item from the list, click the *Delete* button and *OK*.
9. To add information on the intervention attempts, click the *Add* button in the *Attempt* section of the *Intervention Procedure* window. A new row appears in the list. Click the fields and enter the appropriate information.
10. To remove information on intervention attempts from the list, mark it and click the *Delete* button and *OK*.

13.2.8 Hiding Parts of the Vessel Scheme

For your convenience, you can hide parts of the vessel scheme.

1. At the upper left corner of the vessel scheme pane, click *Vessel Tree* to open the dock with the vessel tree.
2. In the vessel tree, clear the checkboxes for the vessels you want to hide in the scheme.
3. To display the hidden vessels again, open the vessel tree and check the respective vessel.

13.2.9 Showing/Hiding Diagnostic Data or Interventions in Schemes

1. In the ribbon bar, select the *Show Diagnostics* checkbox to have your diagnostic data displayed in the vessel scheme, or clear the checkbox to hide the diagnostic data.
2. In the ribbon bar, select the *Show Interventions* checkbox to have your interventions displayed in the vessel scheme, or clear the checkbox to hide the intervention data.

13.2.10 Import Previous

Select the *Import Previous* button on the ribbon toolbar if you wish to import a scheme from a previous exam.

In the import window, you may select one or all vessel segments to import. The information in the import window will auto-populate the current scheme and can be edited further if desired.

Intervention data from the previous exam will show on the current scheme as diagnostic data.

13.2.11 Quick Links

Quick link buttons are listed in the right dock of the Cardio Editor.

Select the *Ventriculography Findings* quick link to launch a pop-up version of the *Left heart cath/Ventriculography* tab under the Diagnostic form. This allows physicians to complete their ventriculography findings without moving from the Cardio Editor.

13.3 Cardio Editor – Painting Mode

The painting mode allows you to "paint" in any kind of image obtained from imaging modalities.

The painting mode of the Cardio Editor requires previously taken images to work with. The original images will not be altered but copied when saved in the Cardio Editor or exported to the key image archive.

13.3.1 Toggling between the Diagnostics and Interventions Lists

Diagnostic and intervention data are listed in the right dock of the Cardio Editor window as soon as they are created.

- Toggle between diagnostic and intervention lists by clicking the *Diagnostics* or *Interventions* button at the bottom of the *Diagnostics and Interventions* dock.

13.3.2 Choosing an Image

Prior to working with images in the painting mode of the Cardio Editor, images associated with the examination must be available in the key image archive.

If there are no images for the examination in the key image archive:

1. Upon starting the Cardio Editor in painting mode, you will receive a message that no images are available for this examination.
2. Click *OK* to create a blank image to work with.

If you want to import new images to work with in the Cardio Editor:

1. On the *Patient Information* screen under the *Exam Log* tab, open the examination in question.
2. On the *Examination* screen, open the *Key Image/Waveform Archive* form.
3. In the exam functions toolbar, click the *New Archive* button; a file manager window opens.
4. Navigate to the images you want to upload to the key image archive.
5. Mark the image you want to upload and click *Open*.
6. In the following window, you can add tags or descriptions to the image.
7. Click *Save*.

If you have GE Centricity Cardiology Imaging (CCI), you can add images to the key image archive from CCI.

1. With both CCI and CCW open to the same patient exam, locate the desired image in CCI.
2. Pause the image and select the *Export image to CVIS* button.

If images for the examination already exist in the key image archive:

1. Upon starting the Cardio Editor in painting mode, the *Export to Cardio Editor* window opens.
2. Select the checkbox next to the image or images you want to export to the Cardio Editor.
3. Click *Done*. The Cardio Editor opens in painting mode.
4. At the right-hand side of the ribbon bar, in the Image section choose the image you want to use from the *Choose Image* drop-down list.

13.3.3 Lines

Drawing Lines

1. To draw a line, first choose a type of line from the Free Painting section in the ribbon bar.
2. With your mouse, draw the line in the picture.

There are four different types of lines:

- ***Pen*** - Allows you to draw a line in any shape you want. Hold the left mouse button pressed and draw the line.
- ***Line*** - Lets you draw straight lines. Left-click your mouse to define a starting point, move your mouse pointer to the required end point of the line, and left-click your mouse again.
- ***Curve*** - Allows to draw smoothly curved lines. Left-click your mouse to define a starting point, move your mouse pointer to the next required turning point of the curve, left-click your mouse again to define the turning point, and go on marking as many turning points as you require.
- ***Polyline*** - Lets you draw straight, cornered lines. Left-click your mouse to define a starting point, move your mouse pointer to the next required corner of the curve, left-click your mouse again to define the corner point, and go on marking as many corner points as you require.

Changing the Thickness of Lines

1. In the *Painting Options* section of the ribbon bar, click *Thickness*.
2. Choose from the drop-down list of predefined values. The chosen thickness will be used until you change it again.

Using Colors and Patterns for Lines

Lines can either be drawn in a solid color or in a pattern.

To draw a line in a solid color:

1. In the *Painting Options* section of the ribbon bar, click *Color*.
2. Choose from the table of predefined colors or define a new one.
3. Click *OK*.
4. Draw any kind of line.

To easily visualize certain diagnoses or interventions, the painting mode provides a predefined set of patterns to draw with.

To draw a line with a pattern:

1. In the *Painting Options* section of the ribbon bar, click the pattern list and choose a pattern from the list directly or click the drop-down arrow in the bottom right corner to open a drop-down list with labeled patterns.
2. Choose from the list of patterns.
3. Draw any kind of patterned line.

Erasing or Deleting Lines

To erase parts of a line:

1. In the *Free Painting* section of the ribbon bar, choose *Eraser*.
2. Click *Thickness* to adjust the size of the eraser for more precise editing.
3. With your left mouse button pressed, erase lines or parts of lines. The *Eraser* function acts like a paintbrush, painting over items in white, including items on the background image.

To delete a line:

1. In the *Free Painting* section of the ribbon bar, choose *Selection*.
2. Click the line in question to mark it; a frame will appear around it.
3. Press **Delete**.

Moving and Scaling Lines

To move a line:

1. In the *Free Painting* section of the ribbon bar, choose *Selection*.
2. Click the line in question to mark it; a frame with handles will appear around it.
3. To move the line, click inside the frame and drag the line to the desired place.

To scale a line:

1. In the *Free Painting* section of the ribbon bar, choose *Selection*.
2. Click the line in question to mark it; a frame with handles will appear around it.
3. Drag the handles to alter the size of the line. The thickness of the line will not be affected.

13.3.4 Adding, Editing, and Removing Comments

To add a comment in the image:

1. In the ribbon bar, click *Add Comment*.
2. The *Add Comment* window opens; enter and format your comment to your liking.
3. Click *Accept*. The comment will appear in the top left corner of the image.
4. Drag it to the required place with your mouse.

To edit a comment in the image:

1. Right-click the comment in question.
2. From the context menu, choose *Edit this Comment*.

To remove a comment in the image:

1. Right-click the comment in question.
2. From the context menu, choose *Remove this Comment*.

13.3.5 Saving and Deleting Images

To save image including paintings and comments in the Cardio Editor:

- In the ribbon bar, click *Save*. The image is now saved in the Cardio Editor environment only; if you want to make it available for other purposes, export the image to the key image archive.

To delete the currently opened image:

- In the ribbon bar, click *Delete*. The image is now deleted from the Cardio Editor environment only.

13.3.6 Exporting Images to the Key Image Archive

To create an image file including your paintings and comments that can be used for any purpose:

1. Click *Export to Key Image Archive* in the ribbon bar. The *Export to Key Image Archive* window will open.
2. Select the checkbox next to the image or images you want to export.
3. Select the *Overwrite linked item(s) in the key image archive?* checkbox if you want to discard former saved versions of the image.
4. Click *Done* to export the image or images.

Next time you open the Cardio Editor for this patient in painting mode, the exported images can be opened and edited.

14 Mac-Lab/CardioLab IT Interfacing

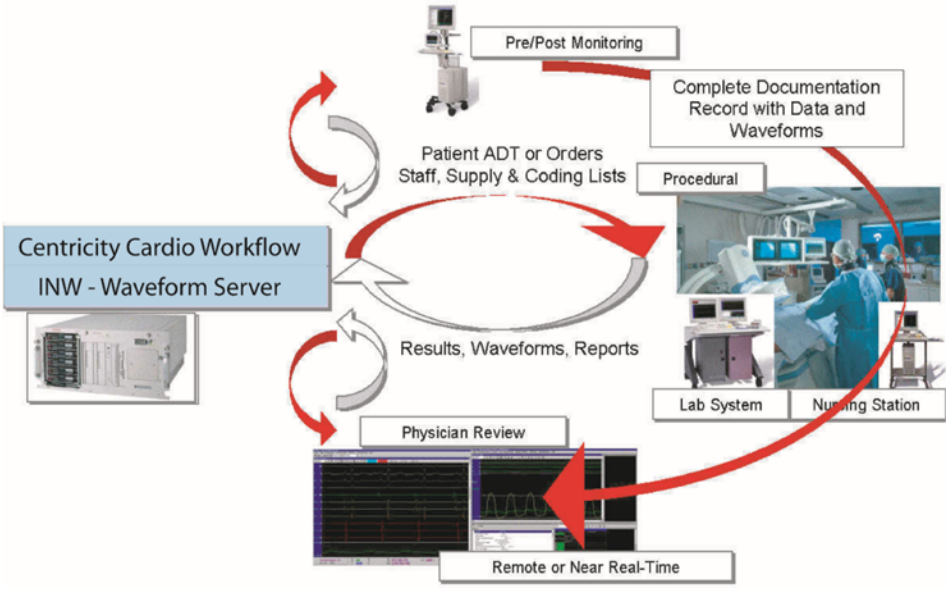
The integration between CCW and the Mac-Lab/CardioLab occurs on three levels:

- Transfer of patient demographics to the Mac-Lab/CardioLab as well as launching integrated cases.
- Data element sharing between Centricity Cardio Workflow and the Mac-Lab/CardioLab.
- Imported results to the Centricity Cardio Workflow database from the Mac-Lab/CardioLab.

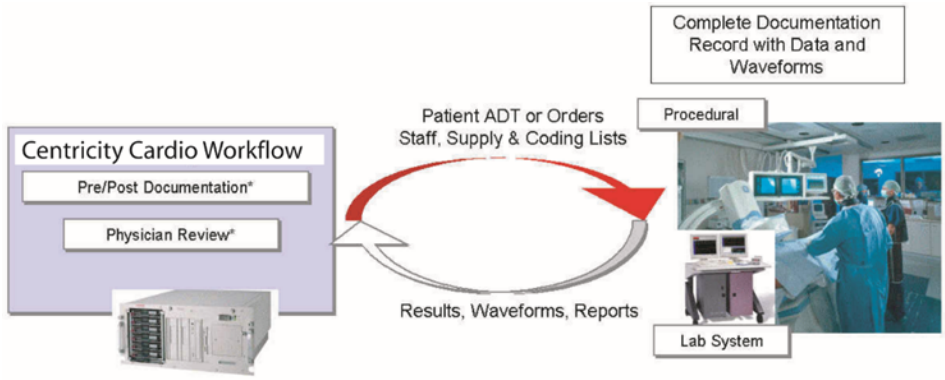
14.1 General Integration Illustrations

The following illustrations further define this integration.

14.1.1 Complete Care Workflow



14.1.2 Abbreviated Care Workflow



* Pre/Post and Review are Waveform snapshots, not the raw Waveform data.

** Procedural workflow cannot include the Nursing workstation

14.2 Patient Demographics Transfer and Launching Integrated Cases

Centricity Cardio Workflow transfers patient demographics to the Mac-Lab/CardioLab as well as launching integrated cases.

14.2.1 Patient Demographics Transfer

The DICOM Modality Worklist industry standard is used to transfer patient demographics from Centricity Cardio Workflow to the Mac-Lab system. The demographic content that is transferred includes:

- Patient ID
- Patient Name
- Middle Initial
- First Name
- Date of Birth
- Gender
- Height
- Weight
- DICOM Study Instance Unique Identifier (The DICOM Study UID is a unique number created for each study by Centricity Cardio Workflow for the Mac-Lab/CardioLab. The Centricity Cardio Workflow Exam Number is a component of this UID. This unique number is important in the managing of study results and images.)
- Scheduled Performing Physician (First physician assigned to the exam in the Centricity Cardio Workflow system)

Centricity Cardio Workflow can be enabled to send the DICOM Modality Worklist to the X-Ray system; when this is combined with the integration of the Mac-Lab/CardioLab, a single transfer can send patient demographic information to entire invasive lab environment.

If a hospital admission and ordering system exists at the clinical facility, HL7 ADT inbound, HL7 order/scheduling and scheduling options are available on Centricity Cardio Workflow to streamline the data entry workflow within the invasive lab.

14.2.2 Launching Mechanism

From within the Centricity Cardio Workflow application, users transfer patient demographic information to the Mac-Lab system while simultaneously launching either the EP or HEMO acquisition modes on the Mac-Lab system.

If the HEMO mode is selected, the acquisition mode is directly entered; if the EP mode is selected, you are prompted for the study type and then the acquisition mode is entered. This can be configured by the Modality definition of the interface.

The launching mechanism is a configured feature associated with each exam mode on the Centricity Cardio Workflow system. You can associate as many exam modes as desired; however, the Enterprise Exam Mode Expansion option must be purchased to allow this configuration.

The following exam modes launch the specified acquisition modes:

Exam Mode	Launch HEMO	Launch EP
Cath	X	
Ped Cath	X	
RH Cath	X	
EP Study		X
Ablation		X
Pacemaker		X

From within the Centricity Cardio Workflow client on the Mac-Lab system, you can continue or review any existing Mac-Lab/CardioLab study. If you attempt to transfer a previously performed study, you are prompted to either continue or review the study.

14.2.3 Emergency Workflow

In an emergency case, a case may have to be initiated on the Mac-Lab/CardioLab system.

Centricity Cardio Workflow then auto-creates the exam and/or patient using the DICOM Modality Perform Procedure Step (MPPS) message created by the Mac-Lab/CardioLab.

14.3 List Management

To ensure quality data collection, list sharing between Centricity Cardio Workflow and the Mac-Lab/CardioLab synchronizes the data elements collected in the course of an invasive procedure. Essentially, Centricity Cardio Workflow is the data element master and the Mac-Lab/CardioLab is the procedural data collector. List contents include supplies, medications, contrast agents, procedures, complications and staffing.

These list elements are maintained by the Centricity Cardio Workflow system and transferred to the Mac-Lab/CardioLab systems by way of a full list transfer. Full list publishing is a manual task on Centricity Cardio Workflow and on each Mac-Lab/CardioLab system.

The server shares the list elements across the Mac-Lab/CardioLab network automatically. Updates are then sent from Centricity Cardio Workflow to the server regularly (every two seconds to every 24 hours, depending on the configuration.)

List management is set up in the following manner:

- Define exam mode sharing
- Define lists (procedures, complications, staffing, materials)

- Run ML/CL List Full Export
- Configure Centricity Cardio Workflow to send list change updates automatically

14.4 Results Parsing

Centricity Cardio Workflow and the Mac-Lab/CardioLab use the HL7 Results industry standard for the transfer of clinical results from the Mac-Lab system to the Centricity Cardio Workflow system. Results parsing occurs in the background, appropriately assigning data. Results include textual/numerical data, such as measurements and log, waveform snapshots, coronary diagramming and nurse report documentation.

There are several results options that can be used in multiple combinations:

Mac-Lab/CardioLab:

- Post results upon every study acquisition/review
- Post results manually, as desired

Centricity Cardio Workflow:

- Import results upon every posting by Mac-Lab/CardioLab
- Import only upon the first posting by Mac-Lab/CardioLab

In addition, the Centricity Cardio Workflow user can use the Exam Lock function on exams that should not be overwritten by an additional Mac-Lab/CardioLab posting.

14.4.1 Setting Combinations

Combination 1

Mac-Lab/CardioLab posts an HL7 Results file automatically at the end of every acquisition or review of a study. Centricity Cardio Workflow is configured to always overwrite its database with the latest results from the Mac-Lab/CardioLab system.

Resulting Workflow

- Any changes within Centricity Cardio Workflow to results or measurements are overwritten by the next Mac-Lab/CardioLab review.
- Ideal when used with a server, with multiple Mac-Lab/CardioLab clients, as the physician only has to edit one record yet maintain that record across all systems.
- You can use the Exam Lock function on Centricity Cardio Workflow to lock certain exams from being overwritten by changes from the Mac-Lab/CardioLab system. Exams can be unlocked at any time.

Combination 2

Mac-Lab/CardioLab posts an HL7 Results file via a manual export request by the user. This should occur only once for each case. Centricity Cardio Workflow is configured to overwrite the database only once with results from the Mac-Lab/CardioLab system.

Resulting Workflow

- Any further changes within the Mac-Lab/CardioLab system cannot be imported into Centricity Cardio Workflow.
- This configuration is ideal for sites where the Mac-Lab/CardioLab is a standalone system and users expect to perform all documentation/editing on the Centricity Cardio Workflow system.
- The Exam Lock function is not necessary in this configuration.

Combination 3

Mac-Lab/CardioLab posts an HL7 Results file via a manual export request by the user. This can occur multiple times. Centricity Cardio Workflow is configured to always overwrite the database with the latest results from the Mac-Lab/CardioLab system.

Resulting Workflow

- Any changes within Centricity Cardio Workflow to results or measurements are overwritten by the next exported Mac-Lab/CardioLab review.
- This configuration extends the most flexibility to the user. You have the option to overwrite the Centricity Cardio Workflow database multiple times; however, the manual export request ensures that the overwrite occurs only when desired.
- You can use the Exam Lock function on Centricity Cardio Workflow to lock certain exams from being overwritten by changes from the Mac-Lab/CardioLab system. Exams can be unlocked at any time.

14.5 Results Content

Centricity Cardio Workflow and the Mac-Lab/CardioLab systems share a range of clinical data. The following tables describe the data types that are shared between the systems.

WARNING: You must verify the patient data displayed on the Mac-Lab/CardioLab system. If the information is incorrect, do not proceed until determining the cause of the data mismatch.

14.5.1 Case Logging

Result	Description	CCW Screen
Procedure Log	Time-stamped log of all case events, including	Procedure Log
Event Log	Time-stamped log of all case commentary	Event Log*
Procedures	Procedural actions	Procedure Log
Complications	Acute complications	Procedure Log Acute Complications

Result	Description	CCW Screen
Staffing	Time-stamped staffing	Procedure Log*Staffing

* These elements are populated specifically from the Mac-Lab/CardioLab system can cannot be documented natively by the Centricity Cardio Workflow user.

14.5.2 Hemodynamic Measurements

Result	Description	CCW Screen
Hemodynamic Pressures	Mean, Ventricular, Atrial Wedge, etc.	Procedure Log Hemodynamics
Peak to Peak Gradients	Locations, Peak Pressures, Gradients	Procedure Log Peak to Peak Gradients
O2 Saturations	Hemoglobin, Saturation, pO2, Content, Location, Averages	Procedure Log Oxygen Saturation
Intervention	Lesion, Treatment and Attempt Locations, Outcomes, etc.	Procedure Log* Mac-Lab Intervention* Intervention
Cardiac Output	Manual, Fick, Thermodilution	Procedure Log Blood Flow/Shunts Resistance/Shunts - Thermo only
Valve Stenosis, Areas and Regurgitation	Aortic, Pulmonary, Mitral, Tricuspid	Valves
Resistance/Shunts	Vascular Resistance and Shunt measurements	Resistance/Shunts
Flow	VO2, Cardiac Output, Stroke Volume, etc.	Blood Flow/Shunts
Stroke Work	Left and Right Ventricle stroke work with indexing	Stroke Work

* These elements are populated specifically from the Mac-Lab/CardioLab system can cannot be documented natively by the Centricity Cardio Workflow user.

14.5.3 Electrophysiology Measurements

Result	Description	CCW Screen
Baseline	Baseline measurements	EP Baseline
SNRT and Pacing	SNRT Measurements and Pacing History	EP SNRT/Pacing
EP Details	Blocks, Refractories and Arrythmias	EP Block, Refrac, Arryth
Ablations	Ablation Summary, Effectivity Summary, Individual Ablation Details	EP Ablations
3D Mapping	Map Name, Phase, Polarity, Mapping IDs, Commentary	EP 3D Mapping

14.5.4 Material Usage

Result	Description	CCW Screen
Supplies	Description, Part Number, Serial Number, etc.	Procedure Log Inventory Decrement*
Medications	Description, Amount, Route, etc.	Procedure Log Inventory Decrement
Contrast Agent	Description, Amount, etc.	Procedure Log Inventory Decrement*
New Supplies	Description, Part Number, Serial Number, etc.	Procedure Log Inventory import of new items

* Decrementing is only applicable when the Inventory option is licensed.

14.5.5 Image/Reports

Result	Description	CCW Screen
Waveform Snapshots	Pressure Measurements, Pullbacks, Cardiac Output Curves, EP Measurements	Image/Waveform Archive*
Image Captures	Image captures created with CardioImage	Image/Waveform Archive*
Nursing Report	Mac-Lab/CardioLab generated reports	Image/Waveform Archive*

* Image/Waveform Archive is a purchasable option.

14.5.6 Other Clinical Data

Result	Description	CCW Screen
Cardio Editor	Cardiac Intervention Diagramming Tool	Cardio Editor **
Standard/Custom	Pre/Post custom data entered in Mac-Lab/CardioLab screens	Standard/Custom*
Vitals	Monitoring Vitals conducted in pre-op, procedural, or post-op	Procedure Log Monitoring Vitals
X-Ray	X-Ray run and dose information	X-Ray

* These elements are populated specifically by the Mac-Lab/CardioLab system and cannot be documented natively by the Centricity Cardio Workflow user.

** Cardio Editor is a portion of the Cardio-Diagramming purchasable option.

14.6 Basic Workflow Summary

Shown below is the basic workflow when Centricity Cardio Workflow is integrated with a Mac-Lab/CardioLab system.

1. Turn on the Mac-Lab/CardioLab system:
   - Launch Mac-Lab (login)
   - Launch Centricity Cardio Workflow (login)
2. Select Patient
   - ADT Query (enter patient details; click on *Query* icon)

     OR
   - Create New Patient (click *New* icon; enter details; save patient record)
3. Click to launch default exam (cath)

   OR

   Right-click to select and launch other exams
4. Perform Exam.

   WARNING: You must verify the patient data displayed on the Mac-Lab/CardioLab system. If the information is incorrect, do not proceed until determining the cause of the data mismatch.

   - Hemo (begins automatically)
   - EP (select study configuration and then begins automatically)
5. End Study
   - Manual Data Export

     OR
   - Close Study (export automatically)
6. Physician Review
   - Report in Centricity Cardio Workflow (Review screens; populate findings; generate report)

     OR
   - No physician review if no report in the Centricity Cardio Workflow system
7. Start Another Case (if applicable)
   - In Centricity Cardio Workflow (return to patient screen; click the *Search* icon; proceed with Select Patient process)

15 Image Review

This section serves as a guide for users of the Centricity Cardio Workflow with either the Centricity Cardio Imaging (CCI), Enterprise PACS configuration, and Enterprise Archive (EA). CCI as well as the Universal Viewer are configured with CCW as a multi monitor system for image review and analysis of images stored within PACS and/or EA.

DICOM and Study Instance UID

The DICOM standard specifies how medical images and their associated information are transmitted.

References to "Study Instance UID" will be made. The Study Instance UID is a DICOM-defined field. UID stands for Unique Identifier. According to NEMA (National Electrical Manufacturers Association) the UID "...guarantees uniqueness across multiple countries, sites, vendors and equipment." CCI and CCW use the Study Instance UID to match the study and the procedure between the two applications.

(For additional details on DICOM, please see the NEMA web site at http://medical.nema.org/. DICOM is the registered trademark of NEMA for its standards publications relating to digital communications of medical information.

General Information

Images acquired during clinical procedures through imaging modalities are archived to PACS systems like GE Enterprise PACS or VNA solutions like GE Enterprise Archive. CCI and Universal Viewer are imaging viewer solutions that provide image analysis and measurement tools for the end user. Together with CCW the comprehensive image archival and review solution provides all necessary image and data information required by the clinicians to support patient care.

Together with the CCW solution this comprehensive image repository provides all necessary image and data information required by the physician to complete a report.

In a dual monitor setting, clinicians are able to review exam data and waveforms with CCW, and the related images with CCI or Universal Viewer. Additional monitors may be configured if supported by the various imaging viewer applications.

15.1 Automatic Launch of the Image Viewer

The recommended workflow is to launch images through the CCW worklist. To automatically open images:

1. Login into the Centricity Cardio Workflow with the default Client Type.
2. From the main patient window select the patient and the exam to be reviewed.
3. The exam main form opens in the Centricity Cardio Workflow client.
4. The images associated with the selected exam will open for viewing in the Image Viewer.

15.2 Manual Launch of the Image Viewer

For certain clinical workflows, the auto launching of images associated to an exam may not be desired. For these workflows, images may be manually opened from within an exam.

Client Type ViewerM or Viewer1M is required as these are the client types configured to wait for user input to open the exam images.

To manually open images:

1. Log into the Centricity Cardio Workflow client, ensure the Client Type ViewerM or Viewer1M is selected.
2. From the main patient window select the patient and the exam to be reviewed.
3. The exam main form opens in the Centricity Cardio Workflow client.
4. From the main exam form, select the *Viewer* icon on the ribbon menu.
5. The images associated with the selected exam will open for viewing on the Image Viewer display.

16 Inventory/Order Management

The Inventory function allows the maintenance of the inventory database with parameters of inventory items, categories, vendors. It can also be used for Order and Invoice Management to provide the ability to track and manage the stock. In order to maintain accurate material stocks, the material consumption must be carefully documented with each exam.

Reference Data is accessible by the administrator and grayed out for other users. Please refer to your administrator for changes to category, vendor, manufacturer detail, or procedure log inventory assignment.

16.1 Inventory and Medication

The *Inventory* and *Medication* screens establish all the inventory parameters, such as the provider, unit price, medical code, description, minimum/maximum stock level quantities, etc., for inventory items and medication items. These data must be maintained if exam material data will be logged, regardless of whether the material is entered via central exam, material button or with the procedure log.

From the landing page, click *Inventory Management*, or navigate to *Menu* > *Inventory Management* from the main screen.

16.1.1 Create a New Inventory Item in the Database

When the *Inventory Management* opens, click *Inventory* at the bottom of the left pane. The *Category* tab is open by default, and all inventory articles in the database are displayed. The *Inventory* screen consists of the *Inventory* pane on the left with the *Category*, *Vendor*, and *Manufacturer* tabs and a table to the right whose content depends on the selected tab and item within the tree diagram of the tab.

Inventory category tree items are grouped by exam modes. These articles can be filtered by selecting the filter drop-down menu next to the printer icon. The default filter is set to *Do Not Show Hidden*. The *Details* window below the table shows detailed information about an item selected in the table above.

For Mac-Lab, the inventory description displayed on the Mac-Lab supplies list is limited to 128 characters. If a Mac-Lab is configured, CCW will only allow inventory description entries up to 128 characters. If no Mac-Lab is configured, the inventory description in the CCW allows up to 256 characters.

A new inventory item is added in the same way from the *Category*, from the *Vendor* or from the *Manufacturer* tab. Click the *New* icon to open the *Add or edit Inventory* dialog. The following entries appear in the *Add or edit Inventory* dialog:

- ***Description*** - Description of the item.
- ***Reference No.*** - If the invoice functionality is used. This field must be filled out if using Mac-Lab or CardioLab list sharing.
- ***Classification*** - Allows you to assign a classification type to an item. This is a predefined list and cannot be edited.
- ***Size*** - Allows you to enter the item size and the size to be viewable on the Mac-Lab/CardioLab system.
- ***Barcode*** - String if the barcode reader is used to identify materials.

When a barcode scanner is used to create a material in the database, all other information about the material must still be entered. The barcode for the material will not generate the database information.

- Multiple barcodes may be entered for each item by selecting the barcode button next to the barcode field inside of the *Add or edit Inventory* dialog. The barcode that is selected as the 'Primary' barcode will be sent to the Mac-Lab or CardioLab in the list sharing file and it will be the barcode that is visible in the CCW user interface.
- When searching for inventory orders using the barcode feature in the *Order Management* > *Orders* screen, any of the items listed barcodes can be used. A filtered display of orders that contain that item will be shown.
- When using the CCW procedure log to document materials during an exam, selecting **F2** will open the barcode dialog and any of the item barcodes can be used to locate the items. Once the barcode is entered select **F3** to complete the action.
- All column header filtering using the barcode to locate items must use the primary barcode only.

- ***Manufacturer*** - To be selected from the drop-down combo box.
- ***Sorting*** - Determines where this item should appear in the list. For example, if one item is marked as 10 and another is marked as 20, the item marked as 10 will appear higher in the list. If a line does not have a position number, it will be placed in alphabetical order.
- ***Unit*** - E.g. ml, as administered in the procedure log and the stock management Unit (e.g. bottle, tablet, etc. for ordering).

  These units are transferred to procedure log and exam material log.
- ***Volume per Unit*** - Specifies a total volume of one stock unit (in medical units), e.g. the medical unit is ml, the stock unit is bottle, volume per unit is 100, i.e. 1 bottle contains 100 ml.
- ***Use whole Unit checkbox:***
  - If selected: patient is administered 25 ml but a complete bottle (100 ml) is decreased from stock.
  - If cleared: patient is administered 25 ml, 0.25 bottles (= 25 ml) are decreased from stock.
- ***Internal Order*** - If this item is checked, CCW checks for the parent/child stock location relationship to determine where to order the item from. If unchecked, the item will be ordered directly from interface/warehouse.
- ***Par Configuration***- Allows the following attributes to be configured for different managing modes:
  - ***Mode*** - Managing mode to control par configuration and ordering maintenance.
  - ***Hidden*** - Checked if the item shall exist in the database, but not appear in the user-facing lists.
  - ***Package*** - To be checked if the item is delivered as a package of x number of units and enter the Units Per Package.
  - ***Units per Package*** - The number of items in the package. This is used when order proposals are generated.
  - ***Track By Serial*** - Item is tracked by serial number.
  - ***Track By Lot*** - Item is tracked by lot number.
  - ***Book Value*** - To allow calculation of the value of the material in stock.

- ***Expiration Date*** and ***Threshold Date*** - Used if tracking or not tracking articles by lot and/or serial number.
- ***Sales Price*** - Needed for invoicing.
- ***Consignment Good*** - This designates the item as consignment.
- ***Quantity*** - The amount of the item that is currently on the shelf.
- ***Edit button*** - Launches a dialog to configure tracked and non-tracked items per stock location.

- ***Interface Detail:***
  - ***HIS No*** - Unique identifier, for sites with inventory interfaces this may be the inventory management system number.
  - ***HIS Description*** - The item description that is maintained by the inventory management system. This description will not be exported to the Mac-Lab/CardioLab in list sharing; it is used for inventory interfaces only. This field is read only.
  - ***Inventory Code*** - The unique code given to every inventory item. This number is assigned by the system and cannot be edited.
- ***Tax*** percentage.
- ***Usage Start*** and ***Usage End*** date selection - Used if the article is used during a specific period of time.
- ***APC Code*** - Ambulatory Payment Classification Code. This is a billing code system used exclusively for Medicare and Medicaid Insurance Types.
- ***Billing Codes*** - Can be entered or removed for the item by selecting the *Add* and *Delete* buttons. Selecting the *Add* button will open a dialog of all system billing codes. Select the appropriate code or codes by highlighting and selecting *Ok*. If the required billing code is not in the list, select the *New Billing Code* button in the *Billing Codes* dialog to add to the list. To delete a billing code assigned to an item, highlight the listed billing code and select the *Delete* button.
- ***Auto Order*** - If this item is checked, a new order will be created in the CCW Inventory and this will go out automatically to the requisition without any user interaction.
- ***Do not order*** - If this item is checked, the item will not be included in an order proposal.
- ***New by HIS*** - This is checked when a new item is added to CCW via the inventory interface.
- ***Reusable*** - This designates the item as being reusable.
- ***Report*** - This is for filtering purposes only in the *Stock Management* > *Statistics* dialog.
- ***Tracking*** - Allows the tracking of an item by lot number, serial number or both.
- ***Category***, ***Vendor*** (including the ***Preferred Vendor*** for this article) and/or the ***HIBC PCN UM*** - Information relating to the material item can be entered.
- ***Comments*** - Associated to the item can be added.

If a billing code has not previously been assigned to a billing code type, adding a billing code in the *Add or edit Inventory* dialog for an item will automatically assign a billing code type of *Inventory*.

Click *Apply* to save the new inventory item to the database or cancel to clear the entry.

16.1.2 Create a New Medication Item in the Database

When the *Inventory Management* opens, click *Medication* at the bottom of the left pane. The *Category* tab is open by default, and all inventory articles in the database are displayed. The *Medication* screen consists of the *Medication* pane on the left with the *Category*, *Vendor*, and *Manufacturer* tabs and a table to the right whose content depends on the selected tab and item within the tree diagram of the tab.

Medication category tree items are grouped by exam modes. These articles can be filtered by selecting the filter drop-down menu next to the printer icon. The default filter is set to *Do Not Show Hidden*. The *Details* window below the table shows detailed information about an item selected in the table above.

For Mac-Lab, the inventory description displayed on the Mac-Lab supplies list is limited to 128 characters. If a Mac-Lab is configured, CCW will only allow inventory description entries up to 128 characters. If no Mac-Lab is configured, the inventory description in the CCW allows up to 256 characters.

A new medication item is added in the same way from the *Category*, from the *Vendor* or from the *Manufacturer* tab. Click the *New* icon to open the *Add or edit Medication* dialog. The following entries appear in the *Add or edit Medication* dialog:

- ***Description*** - Description of the item.
- ***Reference No.*** - If the invoice functionality is used. This field must be filled out if using Mac-Lab or CardioLab list sharing.
- ***Unit*** - E.g. ml, as administered in the procedure log and the stock management Unit (e.g. bottle, tablet, etc. for ordering).

  These units are transferred to procedure log and exam material log.
- ***Volume per Unit*** - Specifies a total volume of one stock unit (in medical units), e.g. the medical unit is ml, the stock unit is bottle, volume per unit is 100, i.e. 1 bottle contains 100 ml.
- ***Use whole Unit checkbox:***
  - if selected: patient is administered 25 ml but a complete bottle (100 ml) is decreased from stock.
  - if cleared: patient is administered 25 ml, 0.25 bottles (= 25 ml) are decreased from stock.

  It may be required to document medical usage of an inventory item separately from total volume in procedure log/exam material log, e.g. use 25 ml of a certain medication which is in a single bottle of 100 ml. If a partially administered article is chosen in the procedure log, you are prompted to enter the amount administered in a dialogue box (this is configurable).
- ***Route*** - The route used to give the medication such as IV or PO.
- ***Medication Class*** - Class of medication, such as beta blocker.
- ***Infusion Rate*** - The infusion rate of IV drip medications, such as 15 mcg/kg/min.
- ***Barcode*** - String if the barcode reader is used to identify materials.
  - When a barcode scanner is used to create a material in the database, all other information about the material must still be entered. The barcode for the material will not generate the database information.
  - Multiple barcodes may be entered for each item by selecting the barcode button next to the barcode field inside of the *Add or edit Medication* dialog. The barcode that is

selected as the 'Primary' barcode will be sent to the Mac-Lab or CardioLab in the list sharing file and it will be the barcode that is visible in the CCW user interface.

- When searching for inventory orders using the barcode feature in the *Order Management > Orders* screen, any of the items listed barcodes can be used. A filtered display of orders that contain that item will be shown.
- When using the CCW procedure log to document materials during an exam, selecting **F2** will open the barcode dialog and any of the item barcodes can be used to locate the items. Once the barcode is entered select **F3** to complete the action.
- All column header filtering using the barcode to locate items must use the primary barcode only.

- ***Hidden*** - Item is not visible in CCW or list sharing.
- ***Interface Detail:***
  - ***HIS No*** - Unique identifier, for sites with inventory interfaces this may be the inventory management system number.
  - ***HIS Description***- The item description that is maintained by the inventory management system. This description will not be exported to the Mac-Lab/CardioLab in list sharing; it is used for inventory interfaces only. This field is read only.
  - ***Inventory Code*** - The unique code given to every inventory item. This number is assigned by the system and cannot be edited.
- ***Tax*** percentage.
- ***Sales Price*** - The sales price of the item.
- ***Expiration Date*** - Date of expiration of the item.
- ***Threshold Date*** - Date of threshold of the item.
- ***Billing Codes*** - Can be entered or removed for the item by selecting the *Add* and *Delete* buttons. Selecting the *Add* button will open a dialog of all system billing codes. Select the appropriate code or codes by highlighting and selecting *Ok*. If the required billing code is not in the list, select the *New Billing Code* button in the *Billing Codes* dialog to add to the list. To delete a billing code assigned to an item, highlight the listed billing code and select the *Delete* button.
- ***Categories*** - Information relating to the material item can be entered.
- ***Comments*** - Associated to the item can be added.

If a billing code has not previously been assigned to a billing code type, adding a billing code in the *Add or edit Medication* dialog for an item will automatically assign a billing code type of *Medication*.

Click *Apply* to save the new medication item to the database or cancel to clear the entry.

16.1.3 Integrating Inventory with the CRM Implant Mode

Inventory integration with the CRM Implant mode requires the following configuration:

- ICD devices (pulse generators) need to have the classification selection of EP AICD. This will populate the *CRM Implant Manage Devices/Leads* dialog as Device Type ICD.
- Pacemaker devices (pulse generators) need to have the classification selection of EP Pacemaker. This will populate the *CRM Implant Manage Devices/Leads* dialog as Device Type IPG (Pacemaker).

- All Leads (ICD and Pacemaker) need to have the classification selection of EP Pacemaker Lead or EP AICD Lead. All leads will then populate the *Leads* tab in the *Manage Devices/Leads* dialog.
- To bring Manufacturer forward to the CRM Implant mode, the inventory manufacturer must be mapped to the IEEE standard manufacturer list.
    - In the inventory module, select the *Manufacturer* tab.
    - Double-click a manufacturer in the list.
    - Select the corresponding manufacturer in the IEEE Manufacturer drop-down list.
    - Select *Ok*.
- Enter the item serial number at the time of the inventory selection or the serial number will not populate the CRM Implant mode.
- If editing an item, all serial numbers have to be manually entered in the CRM Implant *Manage Devices/Leads* dialog.

16.1.4 Resolving New Material Items Added at the Point of Care

New material items can be added from the Mac-Lab/CardioLab system or from the CCW procedure log. The new items can be viewed in the inventory module under the Unresolved node.

1. Open the inventory module.
2. Collapse all inventory categories by selecting the (-) next to the *Categories* node.
3. Highlight the Unresolved node to view all items entered as new from either the Mac-Lab/CardioLab or CCW procedure log.
4. Double-click on item to resolve.
    a. If the item already exists in the database and was entered as new by mistake, select the hidden checkbox and then the *Mark as resolved* button. This will hide the item and clear it from the unresolved list. DO NOT assign to a category.
    b. If the item is new and will be used again, fill out all appropriate fields and assign to a category. Assigning to a category automatically marks the item as resolved and makes it available to the list sharing export to Mac-Lab/CardioLab as well as the material window in the CCW procedure log.

16.1.5 Edit Material Item(s)

From the landing page, click *Inventory Management* or navigate to *Menu* > *Inventory Management* from the main screen.

A material item is edited in the same way from the *Category*, from the *Vendor* or from the *Manufacturer* tab.

1. Double-click or right-click on an individual item on the list and select *Edit item(s)*.
2. Make the desired changes and click *Apply* to save the edited material item to the database or *Cancel* to leave the screen without changes.

Details can be edited for multiple items at one time in the multi-edit inventory pane.

1. To select multiple items, hold the **Ctrl** key and left-click the selected items for editing.
2. Right-click on the highlighted list of items and select *Edit item(s)* to open the *Edit multiple inventory items* dialog.
3. For more information about the individual fields, see Create a New Inventory Item in the Database and Create a New Medication Item in the Database.
4. Changing the value of a field (checking a checkbox, selecting a value from a combo box or entering text in a text field) will display the field label in bold and a "remove" icon next to the field. Clicking this "remove" icon will cancel the update for that field.
5. Click *Apply* to confirm the changes (only the fields in bold and showing the "remove" icon will be updated).
6. Click *Cancel* to roll back the changes and refresh the window.

16.2 Order Management

The *Order Management* screen allows you to create a material order or display all current Material Orders, Order Proposals, and Invoices in the system.

From the landing page, click *Inventory Management*, or navigate to *Menu* > *Inventory Management* from the main screen, and select *Order Management* at the bottom of the left pane.

16.2.1 Order

In the *Filter* pane, several choices are provided to filter the order and order detail list by status. The following options are available from the *Order Status* drop-down menu:

- ***Partial*** - Displays orders that were partially filled.
- ***Complete*** - Displays all complete orders.
- ***Ordered*** - Displays all open orders.
- ***All*** - Displays all order states.

An additional filter by barcode is provided if you enter the barcode. The *Managing Mode* drop-down menu provides filtering per exam mode.

The orders and order details are now displayed per selected filter.

In table lists, it is possible to drag a column header into the space above the column to group the tables per selection. Return the column header to the column to ungroup the tables.

16.2.2 Create or Edit an Order

Click the *New* icon to open the *Add or edit inventory order* dialog for the selected exam mode and enter of following details:

- Order No. If left blank when the order is created, the system will automatically generate and assign an order number. The automatically generated order number can be changed later, if necessary.
- Order Date is automatically populated with the current date.

- Select the *Purchaser* from the drop-down list. If the correct purchaser is not in the drop-down list, select *Other purchaser* and manually enter the name.
- Select the *Vendor* from the drop-down list. It is possible to select an undefined vendor.

Three tabs are available to provided detail regarding the order:

- ***Order Details*** - In the *Article Selection* table, select articles by:
  - Double-clicking an item.
  - Highlighting an item and clicking *Add*.
  - Clicking the *Proposal* button, which enters all articles into the *Order Details* list that dropped below the minimum stock level. The proposal re-order level is calculated as follows: Max level - Quantity on Hand - Quantity on Order.
  - The amount ordered can be manually adjusted.
  - Click the *Order* button to complete the order entry.

- ***Receive Delivery*** - The *Delivery details* section displays an overview of all deliveries and allows the recording of delivered material levels to the stock database.
  - The deliveries can be filtered by order date, vendor, shipping number and whether or not the delivery has been paid.
  - The *Delivery details* table displays delivered amounts in packages and units. The default value of units per package (from the article master) can be changed in the delivery information for the active delivery.
  - To accept a delivery on an order that exists in the database, enter the *Shipping No.* to provide the list of delivered articles and click:
    - *Receive* to confirm that the articles were received.
    - *Close order* to remove the order from the orders list (e.g. if the article was not received for any reason).
    - *Insert* to add a receipt of articles that may not have an order.
  - If using a barcode scanner, in the *Receive Delivery* tab of the order dialog, first select the vendor of the delivery. After the vendor is selected, you can scan the delivered articles. Only articles that are linked to the selected vendor will be found. If an article is scanned, which is not linked to the vendor, this article is not inserted into the item list. If you scan an article that is tracked by serial/or lot number, the dialog opens to insert every single tracked item. Here you can set the focus to the grid and scan the secondary HIBC barcode or the part of the GS1-128 barcode that contains serial/lot no. and/or expiration date.

- ***Delivery History*** - Provides an overview of past received orders.

In table lists it is possible to drag a column header into the space above the column to group the tables per selection. Return the column header to the column to ungroup the tables.

16.2.3 Order Proposals

In the *Order Management* pane, click on the *Order Proposal* icon to display an overview of the order proposals.

Order proposals includes all materials with on-hand stock that has dropped below the minimum quantity. The system does not calculate a re-order when the minimum quantity is still available, since the minimum quantity is considered the minimum acceptable amount that can be in stock. The system subtracts the actual stock and amount currently on order from the proposed maximum stock to determine the re-order level.

Click the *Print* button to print the list of order proposals.

In table lists, it is possible to drag a column header into the space above the column to group the tables per selection. Return the column header to the column to ungroup the tables.

16.2.4 Invoice

In the *Order Management* pane, click on the *Invoice* icon to display material invoice information and correlate materials with the stock database.

Select an invoice in the list to display details of the invoice.

In table lists it is possible to drag a column header into the space above the column to group the tables per selection. Return the column header to the column to ungroup the tables.

Double-click an invoice to open the *Add or edit invoice information* dialog and edit the invoice data. The *Discount* and *Quantity* fields are editable per invoice item. All other fields are calculated or retrieved from the article.

To enter an invoice on a delivery that exists in the database:

1. Click the *New* icon at the top left or right-click anywhere in a row in the *Invoices* table and select *Add new item*.
2. Select a vendor from the *Vendor* drop-down list.
    - If a receipt number exists in the database for this invoice, select the number from the *Receipt No.* drop-down list.
3. Select the *Receipt date*, *Invoice date*, and *Payment date*, and enter the *Invoice No.* in the appropriate fields.
    - The *End of discount date* is automatically calculated by the system.
4. If the delivery is complete, mark the *Complete* checkbox.
5. Click the *Accept* button.
6. Click the *Ok* button to save the invoice information or *Cancel* to leave the screen without changes.

To create an invoice if no related delivery exists in the database:

1. Click the *New* icon at the top left or right-click anywhere in a row in the *Invoices* table and select *Add new item*.
2. Select a vendor from the *Vendor* drop-down list.
3. Enter the receipt number in the *Receipt No.* field.
4. Select the *Receipt date*, *Invoice date*, and *Payment date*, and enter the *Invoice No.* in the appropriate fields.
    - The *End of discount date* is automatically calculated by the system.
5. Select the article from the *Article Selection* table. Only articles for which a price exists can be added to the invoice.

6. Enter the item details, such as *Quantity*, *Price*, *Discount* and *Tax*, and repeat this step as often as needed based on the number of item types in the delivery.
7. Click the *Ok* button to save the invoice information or *Cancel* to leave the screen without changes.

Perform Other Invoice Functions

- If you want to delete an invoice from the system, select the invoice as described above and then click the *Delete* button.
- If you want to print an invoice, select the invoice as described above and then click the *Print* button.

16.3 Stock Management

From the landing page, click *Inventory Management,* or navigate to *Menu* > *Inventory Management* from the main screen, and select *Stock Management* at the bottom of the left pane.

16.3.1 Overview

The *Overview* screen shows all articles in the database. The list can be filtered by any column using the column filters. It can also be filtered based on stock location.

Right-clicking an item in the table allows you to edit the article's stock quantity per stock location.

Color codes indicate when inventory items are near the min stock level, at the reorder point, at the threshold date, and/or at the expiration date. See the color legend at the top of the *Stock Overview* pane.

16.3.2 Additions Log

The *Additions Log* tab allows you to log incoming materials when processing special deliveries that are not handled through the normal workflow. Material transferred through this screen are booked as incoming material, thereby incrementing the material's stock level.

1. Select the *Additions Log* tab to display the list of all articles in the database. The list can be filtered by any column using the column filters.
2. To add incoming material, double-click the desired article in the lower table.
3. In the ensuing window:
    - select the *Stock Location* from the drop-down list
    - specify the *Quantity*
    - specify the *Unit per Package*
4. Click *Ok*. The new article appears in the table and is added to the stock.

You can search for an article by scanning its barcode when the focus of the cursor is set to the article table. If the focus is not set to the table, click once inside the table (into any column). After scanning the barcode, the article gets selected.

If the article is not found the cause may be that a filter is set to the item list. In this case, remove all filters (right-click the table and select Remove all filters) and scan the barcode again.

For HIBC barcode, the article is only selected if the manufacturer is attached and the LIC is inserted for that manufacturer.

It is important that at least one vendor is linked to that scanned inventory article and that this vendor is marked as “preferred vendor”. For this vendor, the addition is generated.

If the article is marked as “tracked by lot” or “tracked by serial”, you can scan the lot- or serial no. and expiration date. Set the focus to the lower grid in the Add additions dialog and scan the secondary HIBC barcode or the part of GS1-128 barcode, which contains lot/serial no. and/or expiration date (data elements (10), (21), (17)).

16.3.3 Losses Log

The *Losses Log* tab allows you to decrement stock not used in typical exam workflow, such as expired medications or materials that were damaged.

1. Select the *Losses Log* tab to display the list of all articles in the database. The list can be filtered by any column using the column filters.
2. To add an article to losses, double-click the desired article in the lower table.
3. In the ensuing window:
    - select the *Stock Location* from the drop-down list
    - specify the *Quantity*
    - enter the *Date* from the calendar if different from current date
4. Click *Ok*. The new article appears in the table and is added to the losses.

You can search for an article by scanning its barcode when the focus of the cursor is set to the article table. If the focus is not set to the table, click once inside the table (into any column). After scanning the barcode, the article gets selected.

If the article is not found, the cause may be that a filter is set to the item list. In this case, remove all filters (right-click the table and select Remove all filters) and scan the barcode again.

For HIBC barcodes, the article is only selected if the manufacturer is attached and the LIC is inserted for that manufacturer.

It is important that at least one vendor is linked to that scanned inventory article and that this vendor is marked as “preferred vendor”. For this vendor, the addition is generated.

If the article is marked as “tracked by lot” or “tracked by serial”, the tracked items (currently available at stock) are listed and you select the lost item.

16.3.4 Statistics

The *Statistics* screen evaluates the changes in stock (shown in amounts of packages and units), based on changes made on the *Additions Log* or *Losses Log* tab and based on the material used during exams. The various filters on the screen allow you to focus the evaluation on certain criteria.

1. Select the *Statistics* icon in the middle pane on the left to display the *Statistics* screen.
    - If needed, edit items of the *Category, Medication, Vendor or Manufacturer* list by double-clicking the item and making the necessary changes in the edit window. Save the modified data with *OK*.

- If needed, add new items to the *Category*, *Medication*, *Vendor* or *Manufacturer* list by right-clicking an item and selecting *Add new item*. Make all the necessary entries and save the new item with *OK*.

2. In the *Statistics* pane, select the appropriate radio button to specify the data to be evaluated.
   - *Additions*
   - *Loss*
   - *Consumed Stock*
   - *Current Stock*
3. If you want to add additional filters before generating a report, use the following options:
   - Enter a *Start date* and an *End date*. If no evaluation period is entered, the entire database is evaluated.
   - ***Summation Temporal*** - Select the interval over which changes in stock are summed up. If *None* is selected, the evaluation is itemized.
4. When all the desired criteria are selected, click the *Generate statistic* button to perform the database query.
5. The resulting table can be filtered and grouped by numerous criteria.

16.3.5 Tracked Items

Articles can be tracked by their Serial Number and their Lot Number using the *Par Configuration* button on the *Add or edit Inventory item* window of the *Inventory* screen.

In the *Stock Overview* screen, a "+" symbol is displayed on the left of any tracked items. Clicking this "+" symbol or double-clicking on a tracked item on the *Stock Overview* screen opens the *Edit current tracked item* window. This window provides an overview of all current and historical articles for which stock movements were recorded and allows you to edit data. The *Unused Only* and *All* radio buttons can be used to filter tracked items.

Items are ordered with respect to the date they were added, with the most recent item located at the top. Pagination will appear for large lists. If so, use the *Previous* and *Next* links or type the page number to navigate through pages of tracked items. The total number of pages is visible next to the page number.

16.4 Transfer Management

The *Transfer Management* screen allows you to move internal stock from one stock location to another or create pending transfers to continue to configure transfer quantity and complete the transfer later.

From the landing page, click *Inventory Management*, or navigate to *Menu* > *Inventory Management* from the main screen, and select *Transfer Management* at the bottom of the left pane.

16.4.1 Transfer Proposal

The *Transfer Proposal* screen lists items used from child stock locations that have met par levels and shall be pulled from a parent stock location. Each location displays inventory item details including Current Quantity, Proposed Transfer Quantity, Child and Parent Location Details, Track by Lot, Track by

Serial, Pending Transfer Quantity, and Manufacturer. All transfer proposals are grouped by *Item Description*, and all checkboxes are selected by default.

Only the *Actual Transfer Quantity* value is editable, and its quantity is equal to the *Proposed Transfer Quantity* value by default. If the *Actual Transfer Quantity* value from one child stock location is more than its *Parent Quantity* value, the *Actual Transfer Quantity* value will be highlighted.

The *Create Pending Transfer* button allows you to save the transfer of internal stock from one stock location to another for later. Pending transfers with a Pending Transfer Quantity value greater than 0 are highlighted in grey in the *Transfer Proposal* screen. You can continue to configure transfer quantity and complete the transfer by double-clicking the pending transfer from the *Transfer* screen to open the *Transfer Proposal* dialog.

Clicking the *Transfer* button will also open the *Transfer Proposal* dialog, when there are proposals with tracked items. If all selected proposals are non-tracked items, then after you modify the *Actual Transfer Quantity* value, then clicking the *Transfer* button will directly complete the transfer.

- The *Actual Transfer Quantity* cell is non-editable for transfer proposals with tracked items; its quantity is 0 by default. Once you select a tracked item and configure the transfer quantity, the sum of the selected transfer quantity will update the *Actual Transfer Quantity* cell.
- The *Actual Transfer Quantity* cell is editable for transfer proposals without tracked items. Its default quantity is equal to the *Proposed Transfer Quantity* value at first.

16.4.2 Transfer

The *Transfer* screen lists completed and pending transfers. Clicking a transfer record displays details of the selected transfer below including Item Description, Quantity, and Child and Parent Location Details.

Completed transfers are displayed with the official Create Date and Transfer Date.

Pending transfer are displayed with only the official Create Date has date. The Transfer Date remains null until you complete the pending transfer.

Double-clicking on a pending transfer opens the *Transfer* dialog for you to complete saved pending transfers.

- Columns with * on the label display the current quantity not the saved quantity. It is possible that the current stock or parent stock quantity has decreased or increased before the saved transfer could be completed.
- The *Pending Transfer Quantity* value is equal to the saved *Actual Transfer Quantity* value when the pending transfer was created. You can refer to the *Pending Transfer Quantity* value to reconfigure the *Actual Transfer Quantity* value.

17 Administrative Reporting

This section describes reporting functions of CCW including how to use database queries, advanced statistics, and crystal reports.

17.1 Queries

17.1.1 Run a Database Query

The *Queries* option allows you to run standard, or preset, database queries about exam data.

1. From the landing page, hover over *Administrative Reporting* and select *Queries* or navigate to *Menu* > *Administrative Reporting* > *Queries* from the main screen.
2. When the *My Database Queries* screen appears, select one of the available queries from the list.
3. Click the *Query* icon.

   When the *Query Results* screen appears, you can view, export or copy the information from the screen.

   You can jump to a specific patient or exam by double-clicking a result row (depending on the configuration of the query).
4. If the query contains filters, the *Query Filter* screen appears. You can use the activated filter data fields to filter the query by entering data in the *From*, *Until* or *Period* fields to filter by date.

   You can filter by exam mode by selecting an appropriate exam mode from the combo box. You can also filter by physician. Select a physician from the combo box, click the *OK* icon. This will start the query.

   Filters can be used only if the appropriate filters are defined in the query. If filters are included in a query, you have to specify values for all active filter fields. Leaving a filter data field empty produces no query results.
5. You can change the filter settings even after you have run the query. If there are filters defined in the query, the Filter icon is available on the toolbar. Click this icon if you want to change any of the filters for this query, then run the query again.

   The *Results* window remains open until you close it. This allows you to work with the results rows one-by-one without having to re-open the *Results* window each time.

   Only the available queries can be selected, and these queries cannot be changed. New queries can only be added if the Advanced Statistics option is purchased.
6. You can toggle between *My Queries* (first listing that appears upon opening the database queries window) and *All Queries*.

   From the *All Queries* window, you can choose which queries are displayed in the *My Queries* window and change the sorting by selecting a query and using the up and down button.

   Settings in the *My Queries* window are user-specific.

17.1.2 Export Database Query Results

After you generate a database query, you can export the data to an ASCII file and use the information in another application.

1. When the query results are displayed, click the *Export* icon.
2. When the *Advise Export File Name* screen appears, select the location where the file should be saved.
3. Enter a name for the results in the *File Name* field. (Use the .txt extension for the file).
4. Click *Save*.

This file can then be exported into a spreadsheet or word processing program.

17.1.3 Copy Database Query Results

After you generate database query results, you can copy the results from the screen and paste them into another application, such as a spreadsheet program.

1. When the query results are displayed, highlight the rows that you want to copy.
2. Click the *Clipboard* icon.
3. Open the spreadsheet or word processing application.
4. Select *Edit* > *Paste*.
5. If desired, save the file from within the spreadsheet or word processing application.

17.2 Advanced Statistics

17.2.1 Advanced Statistics Overview

The Advanced Statistics function allows you to generate evaluations based on database information. This function is an optional, external module (not included in the standard Centricity Cardio Workflow application).

Data stored in the Centricity Cardio Workflow exam forms can be evaluated by creating user-defined queries with this function. After a query is created, it can be saved and re-used whenever required. Query results can preferably be copied via the Clipboard to a spreadsheet program for further processing or stored as ASCII files for further processing with a spreadsheet or editor program (outside the Centricity Cardio Workflow application).

The information can be displayed in one of the following manners:

- ***Exam-based queries*** - All results are linked to exams (as defined in the main exam form with exam no., exam date).
- ***Count-based queries*** - The results are numerical counts of catalog list entries; the count-based query is completely independent of the individual exam, and respectively independent of patient and admission.

The resulting information can be filtered and grouped by versatile criteria.

17.2.2 Use a Pre-Defined Query

The Advanced Statistics screen allows you to query the database for patient information and display the results.

1. From the landing page, hover over *Administrative Reporting* and select *Adv. Statistics* or navigate to *Menu* > *Administrative Reporting* > *Adv. Statistics* from the main screen.
2. When the *Statistics* screen appears, select *Query* > *Open*.
3. When the *Open Existing Query* screen appears, select one of the queries in the list. If you want to filter the list to just the queries you've created, select the *My Queries Only* checkbox. The properties for the selected query display in the right pane.
4. Click *OK*.
5. Set the evaluation period:
   - Either enter the start and end dates in the *Evaluation Period* and *Until* fields.
   - Or select a time frame from the drop-down list.
6. Click the *Execute Evaluation* icon on the toolbar.

17.2.3 Create an Advanced Statistical Query

Only experienced system administrators should create advanced statistical queries. Please contact your system administrator if you require additional queries added to your system.

17.2.4 Display Advanced Query Results

The *Freeze Columns* arrows allow you to fix any number of columns on the left, allowing orientation when you scroll through the remaining columns. Click the *Freeze Columns* arrows until the desired number of columns are selected (dark gray line appears to the right of the selected columns).

The status line on the bottom right of the screen displays the number of exams evaluated and the number of patients evaluated.

17.2.5 Print Advanced Query Results

After you generate a statistical query, you can print the results by clicking the *Print* icon.

The application uses a universal report template for printing. The report is not generated until you click the *Print* icon. Up until the *Print* icon is selected, the contents and layout of the report (and the number of columns in particular) are not known. For this reason, the print layout is simple and cannot be adjusted for a specific query. If you want to add additional formatting, use the Export or Clipboard function to use another application for formatting.

17.2.6 Export Advanced Query Results

After you generate a statistical query, you can export the data to an ASCII file and use the information in another application. It is recommended that you use the copy function instead of the export function.

1. When the query results are displayed, click the *Export* icon.
2. When the *Advise Export File Name* screen appears, select the location where the file should be saved.
3. Enter a name for the results in the *File Name* field. (Use the .txt extension for the file).
4. Click *Save*.

This file can then be exported into a spreadsheet or word processing program.

17.2.7 Copy Advanced Query Results

After you generate statistical query results, you can copy the results from the screen and paste them into another application, such as a spreadsheet program. Copying the results into another application is recommended versus using the export functionality.

1. When the query results are displayed, highlight the rows that you want to copy. Use the *Select all* button to select all result records for copying.
2. Click the *Clipboard* icon.
3. Open the spreadsheet or word processing application.
4. Select *Edit* > *Paste*.
5. If desired, save the file from within the spreadsheet or word processing application.

17.2.8 Show Advanced Query Results in a Chart

After you generate a statistical query, you can show the results in a chart.

1. Click on the *Chart* icon to view the data of the query result table in a chart.
2. When the chart is displayed, move the mouse over the chart elements to display a tooltip.
3. Copy the chart to the clipboard, print it or save it as image file.
4. Click on the *Clipboard* icon to copy the chart image to the clipboard.
5. Click on the *Print* icon to print the chart. When the print screen appears, select the desired print settings. The printer can be set in the *File* > *Page Setup* dialog. Click *File* > *Print* to print the chart.
6. Click on the *Save* icon to save the chart as an image file. When the Save dialog appears, choose a directory, enter a name for the image file and select the desired format. You can save the file in bmp, jpg, tif, png or gif format.

It is possible to change the layout of the chart (chart type, colors used, etc.). Contact your system administrator to change the layout of the chart.

17.3 Administrative Reports

When *Admin Reports* is selected from the landing page or from the menu in the main screen, a window opens, which displays a selection of crystal reports available to you. Operations used to manage administrative reports should only be used by the administrator.

18 Report Template Designer (RTD)

WARNING: The user is responsible for validating the content of created or edited report templates by checking the data fields in the created report.

CCW contains an integrated text editor for generating reports on exam data extracted from the CCW database. All data recorded in the exam screens and exam findings can be incorporated in the report editor.

Data from the CCW database is transferred to the report designer using a report template. The report template defines how and in what format the report will be generated and which data from the CCW database will be used for populating the report.

Report templates can be assigned to specific examination modes. This ensures that unique reports are available for their intended clinical areas. Reports are meant to be used as official documents that are signed and sent to their respective addressees. Memos are meant to be used as internal notes only.

18.1 Templates, Module Sequences, and Modules

Since reports and memos usually resort to recurring contents, report generation is based upon predefined templates, module sequences, and modules. CCW administrators can create as many individual templates as required.

For daily routine, the user selects a preconfigured template and generates a report based on this template. The templates are provided by the administrator in charge using the RTD.

With the RTD, you can generate and edit report templates, but to do so, you must be familiar with the CCW database. Some functions require that you are also familiar with SQL. Only specially trained users are authorized to create/edit report templates or report modules and only employees with the necessary rights may create or change report templates. GE Healthcare does not assume any responsibility for reports, report templates, or report modules created/edited by the user.

To open the RTD, navigate to *System Management* > *Report and Memo Design* > *Report Template Designer* from the landing page or from the main *Menu* and then click *Open*.

Since the RTD is an independent application within the CCW environment, it will open in a new application window.

The templates usually contain at least one module used as the report header and one module sequence providing the clinical content of the report.

Modules may comprise of texts, images, and data retrieved from the CCW database. Though modules are not limited in size, it is advisable to restrict their content to reasonable bits of information that are likely to be used in different contexts. Report headers are also implemented as modules.

Module sequences comprise of a combination of several modules that can be used in different templates. Combining modules in module sequences and adding a sequence to the template instead of multiple modules makes template arrangement clearer and their management easier.

Templates describe the layout of a report form, including modules, module sequences, and individual text passages or other elements that are not included in a module.

18.2 Quick Access from a Template

Instead of selecting modules or module sequences that are located on a template (like the sample report header and a sequence next to it) from a list, you can single-click the respective placeholder and directly bring up the module sequence or module document for editing with the *Edit* button.

18.3 Toolbox Buttons

If you have selected a module, a module sequence, or a template in the *Toolbox*, the following buttons are available:

- Create a new item
- Delete the selected item
- Open the selected item for edit (opens the module or template in the document screen and shows the list of modules of a module sequence)
- Edit the properties of the selected item (opens the item's properties for editing in the same manner as the ribbon item *Properties* when in edit mode)
- Duplicate the selected item (copy)
- Import a previously exported item
- Export the selected item (to disk)
- Display a preview of the selected item (available for *Report Templates* and *Module Sequences* only). In preview mode, you cannot apply any changes

18.4 Module Properties

To view and edit the properties of a module:

1. In the *Toolbox*, select *Modules*.
2. Select a module in the list and click *Edit the properties of the selected module* or double-click a module in the list and then click the *Properties* button in the ribbon.

Module Info Pane

Both *Code* and *Description* should refer to the module's content and its origin, e.g. if the medical content is the EF on the detail form *Ventriculography*, you could use "VentriEF" as the code (up to 32 characters) and "Ventriculography: EF" as the description.

You cannot change a module's code after saving. This restriction is intended to protect modules that have been linked to a module sequence or directly to a template.

Settings Pane

- ***Image Print Layout*** - Select this item if you want to use the module for printing tagged key images. The module will be available in the properties of the placeholders of the category *Key*

Image Archive Fields and in the generated report under *Insert – Image from Key Picture Archive*.

- ***Addendum Layout*** - Select this item if you want to use the module as an addendum. At the time of adding an addendum to an already existing locked report, the user can choose among all addendum layouts available for insertion at the top or at the end of the report. You can include a signature in an addendum.
- ***Hidden*** - Hide a module if you want to keep it, but prevent it being added to templates and module sequences.
- ***Delete table rows if data fields empty*** - Select this item if you want to exclude all table rows where all placeholders are empty.
- ***Include in report:***
  - When *If datafields contain data* is selected, the module is only sent to the report if at least one of its placeholders is not empty (this is the default setting).
  - When *If the default table contains data* is selected, the module is only sent to the report if a data record of the default table exists for the current exam.
  - When *Independent from data* is selected, the module is sent to the report no matter if the placeholders or the default table hold any data.
- ***Include only once*** - If there is a 1:n relationship between exam and default table (e.g. exam - interventions), select this item if you want the module to be sent to the report only once, e.g. as a title in front of the data rows that will follow in a different module.

Default Table Tab

It is good practice to pick a default database table for your module, e.g. if you want to display patient demographics, use TBL_PATIENT; for data from the main exam, use TBL_UNTERSUCHUNG; etc. (you can type the first characters of the table and use the type-ahead capability to avoid scrolling through all database tables).

The benefits of selecting a default table are that you can pick the default table's placeholders directly from the top of the data fields box and that you can benefit from the fact that the module's default behavior is that it will only appear in the report if there is a data record in the default table.

Bypassing the Default Table

Although you can add placeholders from various tables to the module in the module's document window at any time and independently of the default table, this should be the exception, e.g. if you need to have data from different database tables in one module, such as patient no. and admission no. in the same line within one module. If you insert data from different database tables in one module, make sure that the data of the different source tables are well defined by PATID, AUFNID, UID, BEFID, and ANFID at the time of report generation; the direct definition of relations between different source tables is not possible at this time. This means, for example, that you can combine patient last name, admission date, and exam no. and date within one module without any problems because for each data table, at the time of generating the report, each of the related IDs is well defined since there is exactly one data record and value per ID.

However, if you have a 1:n:m relationship between, for example, exam, interventions, and inventory items per intervention, you cannot display this relation in a single module because you cannot define the link between inventory items and interventions within only one module. In this case, you need to nestle at least one module per level into the module of its parent data record; please see "Module Properties" on the previous page.

It is good practice not to change the default table after you have added placeholders to a module.

ID

In most cases, after picking a default table from the list, the application will propose a default ID; only because certain tables contain more than one ID, you need to confirm that the proposed ID is correct.

Order by

The *Order by* option allows you to control the order of data records in case of a 1:n relation between exam and default table (e.g. TBL_INTERVENTION). If you only need one column for ordering, you can pick it from the combo box. If you need more than one column, you need to enter the columns manually, separated by commas. Internally, the entered string is added to the underlying SQL statement in the "order by" clause.

Filter

You can enter a free filter in order to define conditions for the module's appearance in the report, e.g. assuming that "age" is a valid column of the default table, you can use the filter "(age>20 and age<50)".

It is good practice to always use outer brackets for the filter. Internally, the filter is added via AND to the "where" clause of the underlying SQL statement. Test all modules with free filters for their performance – if you use sub-selects for example, this can severely affect the performance of the report generation.

MSF (Multi-Select Field) Tab

If you want to insert placeholders for a multi-select field (like the MSF examination on the main exam form, with the data source MSF_UNT_UNTERSUCH), select an appropriate main source table first. The most important would be TBL_PATIENT for MSFs on the patient form, TBL_ANFORDERUNG on the request, TBL_AUFNAHME on admission, TBU_UNTERSUCHUNG on the main exam, and TBU_BEFUND on the findings (use the appropriate IDs as specified in the section ID above).

For MSFs on the exam details form, you need to identify their master data table which in most cases is the database table that holds the non-MSF data fields on the same form. After specifying the main source table, select the MSF-table from the MSF Table combo box (for your convenience, use the type-ahead capability: type, e.g. "msf_unt_unt", keep the proposed table if correct, or open the combo box to pick the required msf-table).

Enter characters that will separate the entries if there are multiple items in the MSF data field in the MSF Separator data field. If no separator is specified, the default is that multiple items will be separated by line feeds. In the provided MSF sample modules, the preferred separator is ", " (comma and blank).

Enter filter conditions in the field *MSF Filter*, e.g., enter "(code like 'Cor%')" if you only want to display all items whose code begins with "Cor".

In the MSF module's document screen, pick the placeholder from the category *Multi-Select Fields* in the *Data Fields* box.

In the MSF module's document screen, you can combine the placeholder of the MSF code with other placeholders, but this is not recommended, since a module with MSF table only appears in the report if at least one item is in the MSF field, irrespective of whether other data fields hold data.

Module SQL Query Tab

You need to have at least a basic knowledge of the SQLServer SQL syntax, as well as of the CCW database structure in order to applying SQLs.

In the SQL, you can use the following bind variables (case-sensitive):

- :nUId (UID, exam ID)
- :nBefId (-> BEFID, findings ID)
- :nPatId (-> PATID, patient ID)
- :nAufnId (AUFNID, admission ID)
- :nAnfId (ANFID, request ID)

Images Tab

On this tab, you can specify the maximum width and height for a picture that is inserted at the time of report generation. The parameter that is more restrictive will prevail; the proportions of the picture remain unaffected.

18.5 Creating and Editing Templates, Modules, and Sequences

The usual way to create a report template is to create a new empty template and fill the template with the required content, such as layout elements (e.g. cover pages with addressee and sender sections, headers and footers containing logos and page numbering, etc.), information from the CCW database (e.g. patient data, exams, and findings), signatures, etc.

The following steps show the typical workflow for the creation of a report template, i.e. creating the template itself, creating modules and module sequences for use in different templates, and inserting individual elements that are not part of a module in a template.

You can work on multiple objects, keeping their windows open as long as needed.

Prerequisites for Designing a Template

Before you start designing a template, specify exactly what the content of the report based on the template to be designed should be:

- Define the layout for a report header that is implemented as a module. If you want to use pictures in the header or directly on the template, consider that it is important to use "small" pictures (i.e. pictures with minimal file size, resulting from resolution and number of colors): The generated reports are stored as compressed files in the CCW file archive, but even compressed "big" pictures will take up unnecessary space on the server.
- Define the report's clinical content, i.e. information from CCW that is implemented as a module sequence.
- Define how to break down the clinical content into well-defined sections that reflect the different clinical topics – these sections are implemented as modules.
- Identify the DB source table.column for all data points that you want to include in your report (in the main CCW application, navigate to *System Management* > *Mode Maintenance* > *Layout Designer* and check the box next to the field *Display Field Names*), navigate to the data point that you want to check and place the cursor in the data field - you can read the table.column in the UI's status bar. For example, go to *Diagnostic, Left Heart Cath* and place the cursor in the *EF Method* field: the status bar will display "TBU_DG_LeftHeartCath.EFMethod".

Test Report Templates

Each edited or new report template or memo requires extensive testing on the part of the user. This applies to changes to the report template, the module sequence or an incorporated module.

To test the template, generate the report or memo within the application and closely examine whether the report meets the expectations.

Additionally, compare the data in the report with the data in the application (original data on application screens) to verify that the data is associated correctly.

For validation of the templates, make sure that all data fields contained in the template contain data in the CCW form(s) and that numeric data is different for all involved numeric fields.

Creating a Sample Report Template

The following example illustrates how to create a report template. In this example, a single module as report header and a simple module sequence will be added to a new template.

STEP 1: Create a New Empty Template (e.g. MyTemplate)

1. In the Toolbox, select *Report Templates*.
2. Click the *Create a new report template* button.
3. In the *Edit Report Template Properties* window, specify a *Code* (as short and significant as possible, because this is what the user selects when generating a report) and a *Description*. For this example, let us use the code *MyTemplate*.
4. In the *Settings* section, check *Template for Reports*. You may select additional options including *Template for Memos*, *Image Print Layout*, and *Hidden*. The report's content determines which options are appropriate.
5. In the *Addressee* section, select all the relevant individuals who will be addressed in the report.
6. Click *Accept* to save the new report template. The new template *MyTemplate* appears in the list of report templates in the Toolbox and it will be available in the CCW main application. If you need to change the properties later, you can access the properties of the object in the active window by clicking the *Properties* button in the ribbon.

STEP 2: Create a New Module as Report Header (e.g. MyReportHeader)

1. In the *Toolbox*, select *Modules*.
2. Click the *Create a new module* button.
3. In the *Edit Module Properties* window, specify a *Code* and a *Description*. For this example, let us use the code *MyReportHeader*. For a report header that is supposed to contain only static text or pictures, you do not need to specify a data source. In this case, you need to select Independent of data in the *Include in report* drop-down list.
4. Click *Accept*. The new module *MyReportHeader* appears in the list of modules in the Toolbox. If you need to change the properties later, you can access the properties of the object in the active window by clicking the *Properties* button in the ribbon.

To add a table with static text and a picture to the saved module:

1. With the new module open in the active window, select *Insert* > *Table* from the ribbon and insert a table with 1 row and 2 columns.

2. Place the cursor into the first cell and type required text.
3. Place the cursor in the second cell and select *Insert* > *Image* from file from the ribbon and insert any picture (as mentioned under *Prerequisites for Designing a Template* above, use a "small picture").
4. Click *Save* on the *Home* tab.

STEP 3: Create New Modules for Clinical Content (e.g. MyPatientData & MyDiagnosticLVData)

1. In the *Toolbox*, select *Modules*.
2. Click the *Create a new module* button.
3. In the *Edit Module Properties* window, specify a *Code* and a *Description*. For this example, let us use the code *MyPatientData* for this first module. Since this module is supposed to reflect patient demographic data, we want to select the DB table *TBL_PATIENT* as the default table and *PATID* as the ID.
4. Click *Accept*. The new module *MyPatientData* appears in the list of modules in the *Toolbox*. If you need to change the properties later, you can access the properties of the object in the active window by clicking the *Properties* button in the ribbon. The document editor opens, providing the new empty module *MyPatientData (Module)*. In this example, we will add the patient's last name, first name, and DOB using matching labels:
    a. Create a new line and type **Last Name:**.
    b. In the *Data Fields* pane, click *TBL_PATIENT* and scroll down to and double-click on *NAME* to insert the placeholder for the patient's last name at the current cursor position.
    c. Create a new line and add the label **First Name:**. Click *TBL_PATIENT* and scroll down to and double-click on *VORNAME* to insert the placeholder for the patient's first name at the current cursor position.
    d. Create a new line and add the label **DOB:**. Click *TBL_PATIENT* and scroll down to and double-click on *GEBURTSDATUM* to insert the placeholder for the patient's date of birth at the current cursor position.
    e. Create a new line and then click *Save*.
5. In the *Toolbox*, select *Modules*.
6. Click the *Create a new module* button.
7. In the *Edit Module Properties* window, specify a *Code* and a *Description*. For this example, let us use the code *MyDiagnosticLVSampleData* for this second module. Since this module is supposed to reflect data from the *Diagnostic* detail form in cath, we want to select the DB table *TBU_DG_LeftHeartCath* as the default table and *UID* as the ID.
8. Click *Accept*. The new module *MyDiagnosticLVSampleData* appears in the list of modules in the *Toolbox*. If you need to change the properties later, you can access the properties of the object in the active window by clicking the *Properties* button in the ribbon. The document editor opens, providing the new empty module *MyDiagnosticLV (Module)*. In this example, we add the diagnostic-LV data Heart Rate and LV Function Assessed and matching labels:
    a. Create a new line and type **Heart rate at time of ventriculography:**.
    b. In the *Data Fields* pane, click *TBU_DG_LeftHeartCath* and scroll down to and double-click on *HeartRate* to insert the placeholder at the current cursor position.

c. Create a new line and add the label **LV function assessed:** . and scroll down to and double-click on *LVFunctionAssessed* to insert the placeholder at the current cursor position.

d. Create a new line and click *Save*.

9. If you want to have blank lines between the modules, it is good practice to add a line feed at the top of each module, not at the bottom. If you cannot seem to place the cursor behind a placeholder, use the **right arrow** key while the placeholder is highlighted. If you want to suppress the display of the whole placeholder description, use *View* and clear the *Show Datafield Details* checkbox.

STEP 4: Create a New Module Sequence (e.g. MyDataSequence)

1. In the *Toolbox*, select *Module Sequences*.
2. Click the *Create a new module sequence* button.
3. In the properties dialog, specify a *Code* and a *Description*. For this example, let us use the code *MyDataSequence*.
4. Click *Accept*. The new module sequence *MyDataSequence* appears in the list of module sequences in the *Toolbox*. If you need to change the properties later, you can access the properties of the object in the active window by clicking the *Properties* button in the ribbon. As instructed at the top of the new *MyDataSequence* window, you can drag and drop modules from the toolbox in the module sequence. The *Open Documents* view, selectable below the *Toolbox*, allows you to quickly drag a new module to a module sequence immediately after saving the module for the first time (if you close a module before assigning it to a sequence, you can still add it to the sequence, but then you need to pick it from the list).
5. Drag and drop the modules *MyPatientData* and *MyLVSampleData* in the *MyDataSequence* module sequence and then click *Save*.

STEP 5: Add the Report Header and Sequence to the Template

1. Go to the template *MyTemplate*. If there are more open windows than can be displayed at a time, click the *Active Files* button and select from the list.
2. From the *Open Documents*, drag and drop *MyReportHeader* and *MyDataSequence* in the template.
3. Click *Save*.
4. Test the template in the CCW main application by generating a report with *MyTemplate* on the exam findings form.

18.6 Working with Modules

There are two methods for selecting modules:

Method 1:

1. In the *Toolbox*, select *Modules*.
2. Use the filter to reduce the number of displayed modules.
3. Double-click on the module you want to work with.

Method 2:

1. In the *Toolbox*, select *Module Sequences*.
2. Double-click on the module sequence that holds the module(s) you want to work with.
3. Double-click on the module you want to work with from within the module sequence.

The advantage of the second method is that you can easily select from all modules that are associated with a specific module sequence, since you often edit more than one module of a sequence at a time.

Insert Static Text

1. Place the cursor in the location on the template or module where you want to enter text.
2. Use the keyboard to enter any text that you want to appear in the report.

Insert a Static Page Break

Place the cursor in the location on the template where you want to insert a static, permanent page break and either press **CTRL+RETURN** or select *Insert* > *Page Break* from the ribbon. A dotted line appears on the template, indicating a page break at that location.

Placeholders

A placeholder's content or its link to the database as [CATEGORY TABLENAME.COLUMNNAME] is displayed in the placeholder if the *View - Show Datafield Details* checkbox is selected, e.g. [TABLEFIELD TBU_DG_LeftHeartCath.HeartRate] is a placeholder of the category TABLEFIELD which links to the database table TBU_DG_LeftHeartCath and its column *HeartRate*.

If the *Show Datafield Details* checkbox is cleared, you will see two question marks representing the placeholder, which can be helpful if you have finished inserting placeholders and work on the layout.

Clicking on the placeholder displays a dialog with the placeholder's properties: database table, column, link ID (which cannot be changed in this dialog) and the *Display catalog code instead of description* checkbox, and the *Text before* (prefix to the data) and *Text after* (suffix to the data) data fields.

Clicking the trashcan will delete the placeholder.

Insert a Placeholder

1. Place the cursor in the location on the template or module where you want to insert the placeholder.
2. In the *Data Fields* box, select one of the available categories. From the list of available items, double-click a placeholder or drag and drop the placeholder to the document. At the time of the generation of the report, the placeholder is replaced with the related data from the database.

Delete Placeholders

You can delete placeholders on a document either by right-clicking the placeholder and selecting the *Remove Field* command or by using the trashcan in the placeholder properties.

You cannot delete a placeholder from a document by using the **Delete** or **Backspace** keys. Also, a selected text block that includes placeholders cannot be deleted before the placeholder has been deleted first.

Box Data Fields – Placeholder Categories

- ***Module Default Table*** - The top-most category in the *Data Fields* box lets you pick a column from the default source table as specified in the module properties. The button of the category itself carries the name of the default table. If there is no default table specified, this category will not be available.
- ***Table Fields*** - This category virtually lets you select any DB table.column of the database. It is possible to put placeholders from different tables side by side in one module, but you should bear in mind that the relationship between them must be well-defined. It makes no sense, for example, to have a column of the request table in the same module as a column of the main exam table.
- ***Multi-Select Fields*** - Use this category to pick placeholders for MSFs. To provide the intended functionality of inserting MSF data into the report, make sure that the master table and MSF table are defined in the module, and that no other placeholders except the one MSF is added to the module.
- ***Custom Fields*** - This category provides the placeholders that represent the custom data of the second-generation custom forms (vertical data model, different DB tables for the different data types). Although there is a description of the item's source template and a description of the item itself, it is good practice to filter by the item ID that can be retrieved in the CCW main application, using Display Field Names and read the ObjectID from the status bar.
- ***Function Fields*** - This category provides placeholders for general use like current date, time, user, default patient no., where "current" means at the time of report generation.
- ***Key Image Archive Fields*** - This category provides place holders for images from the key image archive that have a certain tag – the list of available tags will follow the catalog of tags that can be defined or expanded by the CCW administrator, if necessary. The default tags are "Pre" and "Post", referring to pre- and post-interventional. Once a placeholder is inserted, clicking on the placeholder opens a dialog from which to pick a layout module that will determine the way the images are presented – all modules for which the *Image Print Layout* checkbox is selected in the module properties will be available. If no *Image Print Layout* module is defined for the image placeholder, the images will be inserted into the report side by side, without labels, tags, or frames. If a module is classified as *Image Print Layout*, you can only use three image-related placeholders in the module: the image itself, its label, and its tag.
- ***Print Fields*** - This category provides placeholders for general use, such as print date, page no., page no. total, and address fields of the catalog of referring institutions that can be used as addressees or in distribution lists. These placeholders are populated at the time of printing a report.
- ***Signature Field*** - There is only one placeholder available in this category, which is the *Signature* itself. Use this placeholder to add a signature that is inserted at the time the report is signed. The signer is always a member of the CCW users, and in the user management, all users who are supposed to sign reports need a signature added in their user profiles. The person who is intended to sign a certain report is selected according to the assignments in the module sequences (Assign to Case Event or to User Role). This can be defined per module sequence at the bottom of the screen that lists the modules of a sequence. If no physician is expressly assigned, the default signer is the findings physician. If no findings physician exists, the reading physician or anyone of the reading group must sign. If there is no signature placeholder in the report, the signature will be inserted at the end. If more than one module sequence was added to the template, different sections of the report can have different

signers. For example, you could define one sequence for the diagnostic exam part (assigned, for example, to the user role of the diagnostic physician), and one for the interventional exam part (assigned, for example, to the user role of the interventional physician, according to the case events, or to the examiner on the main exam form if this data field is used in the exam mode). A report will be rated as "confirmed" and locked only after all defined signers have signed it.

- ***SQL Field:***
  - ***Placeholder SQL Query (always available)*** - When this placeholder has been inserted in the module document screen and you click it, it will allow you to define an SQL statement with which to retrieve data from the database. The SQL used here should exactly retrieve one data record from one column only (anything else is omitted).
  - ***Placeholder SQL Query Module*** - This placeholder is only available if there is an SQL defined in the module properties. The number of columns of the SQL's result set should match the number of placeholders used.

18.7 Modules with 1:n:m Relationship

If you have a table structure as used in CCW's Intervention form with the interventions linked to the lesions and the relationship of the applied inventory items and interventional attempts to the interventions, the links are that of a 1:n relationship of the lesion to interventions, and n:m relationship of inventory items and attempts to the interventions.

In order to provide appropriate report layouts for 1:n:m relationships, different modules can be grouped or nested: You use one module for the outermost or top relationship that holds data of the "master" table (like the lesions) to include data from this table (like lesion type, vessel segment, stenosis). To this top-level module, you add another module that reflects the data of the first "slave" table (this is the n-level, like the interventions). Finally, you add the second "slave" module (this is the m-level) to the first one (like the attempts).

To grant the correct grouping (exactly the attempts that belong to the intervention as the top-level object must be listed), you need to apply a filter in the "slave" module:

By using the prefix: PARENT_, you can access all data fields of the "master" table (i.e., the master module's default database table).

In this example, you can use the following IDs for the links:

- filter the first slave module by: PARENT_INTERVENTID; the filter would be "INTERVENTID=:PARENT_INTERVENTID";
- for the second nested module, the filter would be "TREATMENTID = :PARENT_TREATMENTID".

18.8 Working with Module Sequences

There are two methods for selecting module sequences:

Method 1:

1. In the *Toolbox*, select *Module Sequences*.
2. Use the filter to reduce the number of displayed module sequences.

3. Double-click on the module sequence you want to work with.

Method 2:

1. In the *Toolbox*, select *Report Templates*.
2. Double-click on the report template that holds the module sequence you want to work with.
3. Double-click on the module sequence you want to work with from within the report template.

18.9 Assigning Module Sequences to Signers

Module Sequences are the items through which the signing of a report can be controlled. Module sequences can be assigned to a role or to the Reading Group or to both.

The following rules apply per report:

1. If a module sequence is linked to a user role, then the report that contains this module sequence can only be signed by the user who acts in that role for the given examination. In an examination, context roles are assigned in the *Staff* pane on the examination main form. Also, this user must have been assigned to that role through user administration.
2. If a module sequence is linked to the Reading Group, then the report that contains this module sequence can be signed by any user that has been assigned at least one of the roles that make up the Reading Group.
3. If a module sequence is linked to both a user role and to the Reading Group, then the report that contains this module sequence can be signed by the user who acts in that role for the given examination. If no user has been assigned to that role for the given examination, then the report can be signed by any user that has been assigned at least one of the roles that make up the Reading Group.
4. If no module sequence of the report is linked to any user role or to the Reading Group, then the Reporting Physician can sign the report. Depending on the localized version of CCW, a Reporting Physician may not be used. In that case, this rule does not apply.

Assign a Module Sequence to a User Role

1. Select a module sequence.
2. From the *Assign Sequence to User Role* drop-down list, select the appropriate role.
3. Click the *Save* button.

Assign a Module Sequence to the Reading Group

1. Select a module sequence.
2. Check the *Assign Sequence to Reading Group* checkbox.
3. Click the *Save* button.

Signing and Field Locking

Report signing can be combined with data locking. As soon as a report is being signed, a configurable amount of data can be locked automatically. Data that has become locked can then not be modified any longer.

The linkage between report signing and field locking is established through the role. If a module sequence is assigned to a role and at the same time locks are configured on that role, then these role locks become effective at the time when the report is signed, or, in case of multiple signers, when the report is partially signed (see *Multiple Signers per Report* below). Through signing, the module sequence in the report will also be locked, which means that the data of the module sequence cannot be modified.

When the report is generated again, the locked data as well as the module sequence will remain unchanged while only the unlocked part (if existent) will be updated.

Locked data can be unlocked again by opening a dialog from the ribbon on the main exam form ("Remove Role Locks"). For removing role locks, the access right "UNLOCK" is required.

Multiple Signers per Report

Starting with version 5.0.6, CCW supports multiple signers per report.

Multiple module sequences that make up a report can be assigned to different roles for signing. That way, multiple physicians can partially sign the report, each of them in their own specific role. By partially signing the report, the portions of the report that have been assigned to that role become locked and cannot be modified by other roles afterwards.

When a report is generated that contains one or more module sequences assigned to different user roles, the system demands a signature from each of these roles. The report will be routed only when all roles have signed.

To configure a report template for multiple signing, assign the module sequences in the report template to different user roles (see *Assigning Module Sequences to User Roles* above for details on how to assign module sequences to roles).

Dual Signature

A special case of having multiple users sign a report combined with field locking is the Dual Signature scenario:

- Two physicians in different roles work on different data areas,
- one report covers both data areas,
- each physician shall be able to sign their own part of the report,
- as soon as one physician has signed, no one else can modify the data that is assigned to the role of this physician in the report or on the UI, and
- both roles are required to sign the report.

In the Dual Signature scenario two physicians are required to sign a report. An example is a combined report for diagnostic and interventional treatment. The report consists of at least two module sequences; one being assigned to the diagnostic and the other to the interventional role. In addition, role locks on the corresponding data fields have been defined for both the diagnostic and the interventional role.

Each role can partially sign the report. With the signature of the diagnostic role, the diagnostic part of the report along with the associated data becomes locked. The same is true for the interventional part and data when the interventional role signs. Only when both roles have signed, the report is ready for routing.

To setup the Dual Signature scenario:

1. Identify the two roles that are required to sign a report.
2. Assign one or more users to each role.
3. Create a report template with at least two module sequences and assign each sequence to one of the roles.
4. Identify the data related to both module sequences and configure role locks for each.

18.10 Manage Templates

In the properties of a report template, the following settings are available:

Template for Reports

Check this item to make the report template available as a report under version control, to be selected and created in the CCW main application from an exam findings form; ribbon item Create Report.

Template for Memos

Check this item to make the report template available as a memo, to be selected and created in the CCW main application from the main exam form, the admission or the request form; ribbon item Memo.

The generated memos cannot be saved.

Image for Print Layout

Check this item to make the template available for printing images or wave forms in the application's detail exam forms of Key Image Archive and Cardio Editor.

Addressee

It is possible to define, on a per template basis, the addressees of a report that are used during report routing.

18.11 RTD - Discharge Summary

Prerequisites

Assign the detail form *Discharge Summary Settings* to an exam mode (see assignment exam mode – exam forms).

Provide a module sequence for each exam mode you want to include in the summary report – the modules of these sequences reflect the data that is displayed.

Provide a report template as a shell that includes a sequence with a dedicated location for the above-mentioned sequences that cover the exam modes. This dedicated location is represented by a module that contains at least the placeholder for the sequences (FUNCTION.MODULESEQUENCE).

Configure the summary report defaults using the RTD menu via *Menu* > *Discharge* > *Discharge Summary Settings*. The table lists one row of configuration items for each exam mode. For each exam

mode that is supposed to provide data for the summary, check at least one of the default checkboxes and specify a module sequence.

The default can be set to:

- *Remove Exams from Summary*, which will not include data from this exam mode.
- *Default all exams in report*, which will include all exams of the referring exam mode.
- *Default first exam in report*, which will include the first exam of the exam mode.
- *Default most recent exam in report*, which will include the latest exam of the exam mode (combinations possible).

The settings of the exam modes deliver the settings of the list of exams on the *Discharge Summary Settings form* > *Summary Report* tab, i.e. which exams are included in the summary report by default.

Configuration

The admission/discharge summary function allows you to create reports that can include all database information of the admission as well as all exams and exam details that belong to the admission. To create an admission/discharge summary report, select *Menu* > *Discharge* > *Discharge Findings and Summary*.

Here, you will find a list of all exams that belong to the current admission (the current admission number is displayed). Depending on the default settings, exams of given exam modes are included in the summary report (with the *Include* checkbox selected).

In the exam of the exam mode to which the detail form was assigned under Prerequisites above, create the Discharge Findings and Summary.

As necessary, you can change which data appear in a report by manually selecting and clearing the *Include* checkboxes and by changing the order of the exams (using the buttons *Move row up/down*). Once the selection is complete, click the *Report* button, select an appropriate report template, and create the new report by clicking the *New* button.

18.12 Imported Externally Generated Reports

Externally generated reports, such as those from a Mac-Lab, can be included as part of a patient's record. Such reports are listed in the *Report Overview* window under *Imported Documents*.

You have the same options as for a native report if the options are enabled.

If you make changes to an existing report, you are prompted to store the report in CCW. You will be asked to name the new report. All procedures are accessible via the context menu.

18.13 Configure Role Locks

With role locks it is possible to selectively lock tables or fields on the UI at the point in time when a report is being signed.

Role locks can be put on database tables, system data fields inside tables, and custom data fields. A table or data field that holds one or more role locks will be set to non-editable on the UI as soon as a

user who has an appropriate role is signing a report. This ensures that certain data cannot be changed after a report has been signed.

The diagnostic and intervention form will be locked entirely if at least one field on the form has a role lock.

Specific role lock configurations at field level overwrite table level role locks.

Multiple roles can be assigned to one table or field.

From the landing page or from the main Menu, navigate to *System Management* > *Report and Memo Design* > *Role Locks Configuration* to access the *Role Locks Configuration* screen.

Existing role locks are listed in the lower pane of the window.

Add a Role Lock to a Table

To add a role lock to a table:

1. Click the *Add* button. A new empty row will be added at the bottom of the list.
2. From the *Role* drop-down list, select the role that shall lock the table.
3. From the *Table* drop-down list, select the table that shall be locked.
4. Leave *Column* and *ObjectId* empty.

A role lock can also be added using the *Quick Add Table* pane:

1. In the *Tablename* field, select the table that shall be locked from the drop-down list.
2. In the *Roles* field, select one or more roles that shall lock the table from the drop-down list.
3. Click *Add Table*. For each role, one row will be added at the bottom of the list.

Add a Role Lock to a System Field

To add a role lock to a system field inside a table:

1. Click the *Add* button. A new empty row will be added at the bottom of the list.
2. From the *Role* drop-down list, select the role that shall lock the table.
3. From the *Table* drop-down list, select the table that shall be locked.
4. From the *Column* drop-down list, select the column inside the table that shall be locked.
5. Leave *ObjectId* empty.

A role lock can also be added using the *Quick Add System Field* pane:

1. In the *System Field* field, select the table with the field that shall be locked from the drop-down list.
2. In the *Roles* field, select one or more roles that shall lock the table from the drop-down list.
3. Click *Add System Field*. For each role, one row will be added at the bottom of the list.

Add a Role Lock to a Custom Field

To add a role lock to a custom field inside a table:

1. Click the *Add* button. A new empty row will be added at the bottom of the list.
2. From the *Role* drop-down list, select the role that shall lock the table.

3. Leave *Table* and *Column* empty.
4. From the *ObjectId* drop-down list, select the ID of the custom field that shall be locked.

A role lock can also be added using the *Quick Add Custom Field* pane:

1. In the *Custom Field* field, select the ID of the custom field that shall be locked from the drop-down list.
2. In the *Roles* field, select one or more roles that shall lock the table from the drop-down list.
3. Click *Add Custom Field*. For each role, one row will be added at the bottom of the list.

Delete a Role Lock

To delete a role lock:

1. Click on the role lock in the role locks list
2. Click the *Delete* button.
3. In the confirmation pop-up window, click *Yes* to delete the role lock or *No* to cancel.

A role lock on a table locks all system fields or columns in that table.

18.14 Reports Assignments

The *Reports Assignments* screen allows you to assign report templates and report complete states to exam modes.

1. From the landing page or from the main *Menu*, navigate to *System Management* > *Report and Memo Design* > *Reports Assignments*.
2. From the drop-down list, select *Worklist report status* to assign report complete states or *Report Completeness* to assign report templates.
3. From the *Exam Mode* pane, select the desired exam mode.
4. In the right pane, select the checkbox for each report template or complete state you want to assign to this exam mode.

Select the *Display Assigned* checkbox if you only want to display and sort the assigned codes.

18.15 Memos Assignments

The *Memos Assignments* screen allows you to assign memo templates to each form type.

A memo is intended for viewing and printing purposes only. Data in a memo is not stored in the database, as it is not intended to be part of the permanent record.

1. From the landing page or from the main *Menu*, navigate to *System Management* > *Report and Memo Design* > *Memos Assignments*.
2. Select the desired form type in the left pane.
3. Select the checkbox for each memo template you want to assign to this form type.

Select the *Display Assigned* checkbox if you only want to display and sort the assigned codes.

18.16 Access Reports from a Web Browser

A unique URL can be generated for exported CCW reports to allow users to access the reports via a web browser. To generate a URL inside exported XML reports:

1. In the Server, open the GE Config Tool and navigate to *Global Configuration* > *Reporting* > *Report Export* > *Activate menu items for report export* and enable the option *Export to HIS (HL7/DRPT)*.
2. Navigate to *Interface Configuration* > *Report Routing Transaction* > *Report HL7 Routing* and enable the option *Send URL for web access* to include the URL within the exported xml message. Additional settings include:
    - ***Output directory for XML files*** - Click the "..." button to browse and select the folder you want to export XML files to.
    - ***Report format*** - Select the format you want to export to (for example, *PDF/A*).
    - ***Hidden*** - Select an operation mode (for example, *Embed report in XML*).
3. After making the changes, save the configuration and close the GE Config Tool.

By default, all users with a valid Windows Domain User Account can access reports from a web browser. However, if you would like to restrict certain users from accessing reports:

1. Create a new Windows Domain group (this example uses the group name *CCWNetAccess* as an illustration). Members of this group will have access to the webpage.
2. Add relevant user accounts to the new group.
3. In the Server, go to *D:\CARDDAS\Inetpub\ReportWebAccess*, open the Web XML Configuration File and set the following:

    <authorization>

    <allow roles="CCWNetAccess" />

    <deny users="*" />

    </authorization>

Now, when members of the "CCWNetAccess" group log into the client, they will be able to view reports in a web browser at the URL stated in the XML file. When non-members of the "CCWNetAccess" group login, they will not be able to access exported reports via a web browser. Instead, a popup will appear asking the user to enter the Windows Domain credentials of a group member before the report can be viewed.

Windows Authentication must be enabled in the IIS to view the report website.

18.17 Report Routing Configuration

Reports can be linked to roles per organization and per exam mode from the *System Management* > *Report Routing* > *Role Routing Configuration* screen.

Reports can be routed per organization and per exam mode based on patient location (In Patient, Out Patient, or Not Specified) from the *System Management* > *Report Routing* > *Route Assignments* screen.

- Clicking the *Manage Destination* button allows you to add and remove routing destinations (email addresses, fax numbers, and printers).

18.18 Configure Addendum Location in Reports

The location of addendums in reports can be configured using the GE Config Tool:

1. Start the GE Config Tool and load the configuration.
2. In the left pane, select *Global Configuration* > *Reporting*.
3. Select the location from the *Addendum location* drop-down list. By default, the location is set to the top of the report.
4. After making the changes, save the configuration and close the GE Config Tool.

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MD CE

EC REP

GE Healthcare
500 W. Monroe Street
Chicago, IL 60661
USA

GE Medical Systems SCS
283 rue de la Minière
78530 BUC
France

Asian Headquarters
GE Healthcare
1 BLD-3F
No. 1 Hua Tuo Road
Zhang Jiang Hi-Tech Park
Shanghai 201203 China

Türkiye İthalatçısı/Turkish Importer
GE Medical Systems Türkiye Ltd. Şti.
Esentepe Mah. Harman sok. No: 8
34394 Şişli-İstanbul Türkiye