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XRAYVISION DCV®
User Guide

Abstract

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This document contains work instructions related to utilizing the dental imaging application, XrayVision DCV®, version 3.4.0.27 and above.

REVISION HISTORY

Revision Level	Revision Date	Description of Revision	Revision Author
DRAFT	5/11/2011	Draft	Kyle Parker
1.0		Initial Release	
1.1	3/18/2013	Content update. Updated all images to reflect 3.14.0.20 interface. Also added	Kyle Parker
1.2	4/28/2014	Content update. All new features through 3.14.0.27 added.	Kyle Parker

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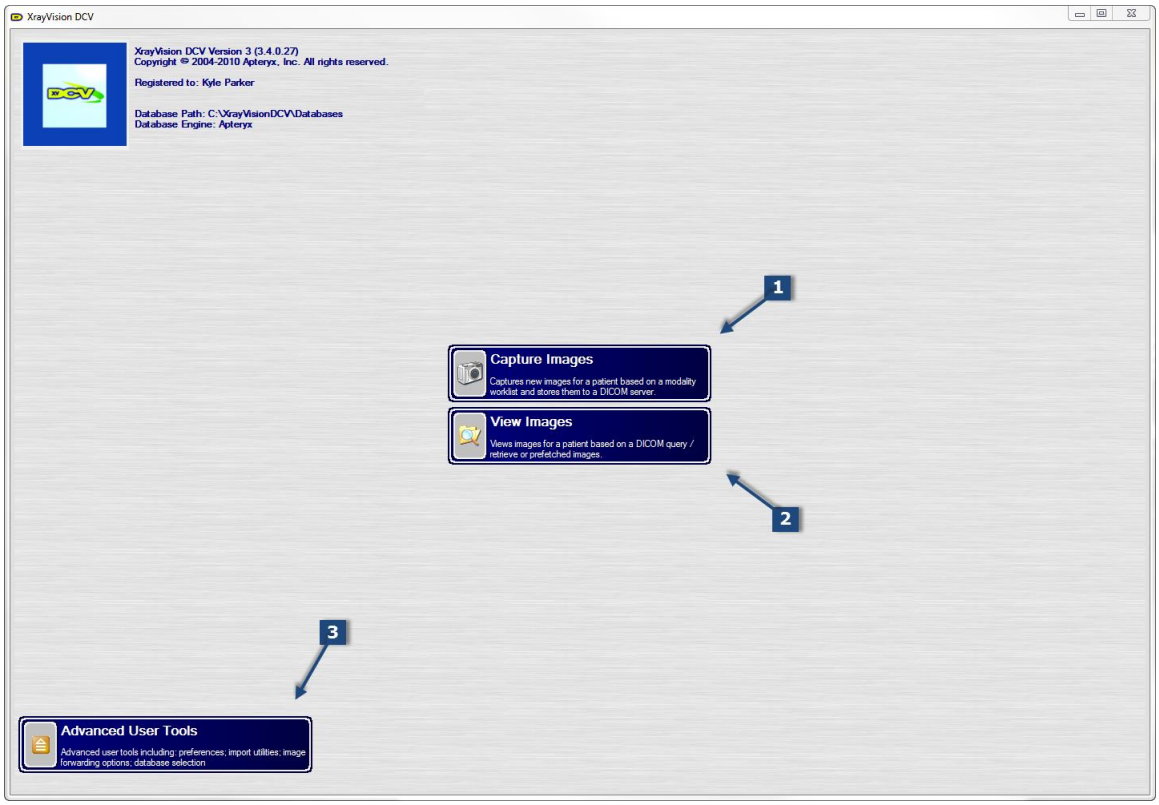
THE USER INTERFACE

General Overview

The user interface within XrayVision DCV is designed to be as intuitive as possible to capture, view, and distribute images. The application is wizard-driven, and provides a series of buttons that walk through each function of the application.

DCV, or XrayVision DICOM Client Viewer, provides a simple interface for users to capture and save images to a DICOM server. DICOM is a medical imaging standard which attaches patient and image specific information to each image captured for a patient.

Interface

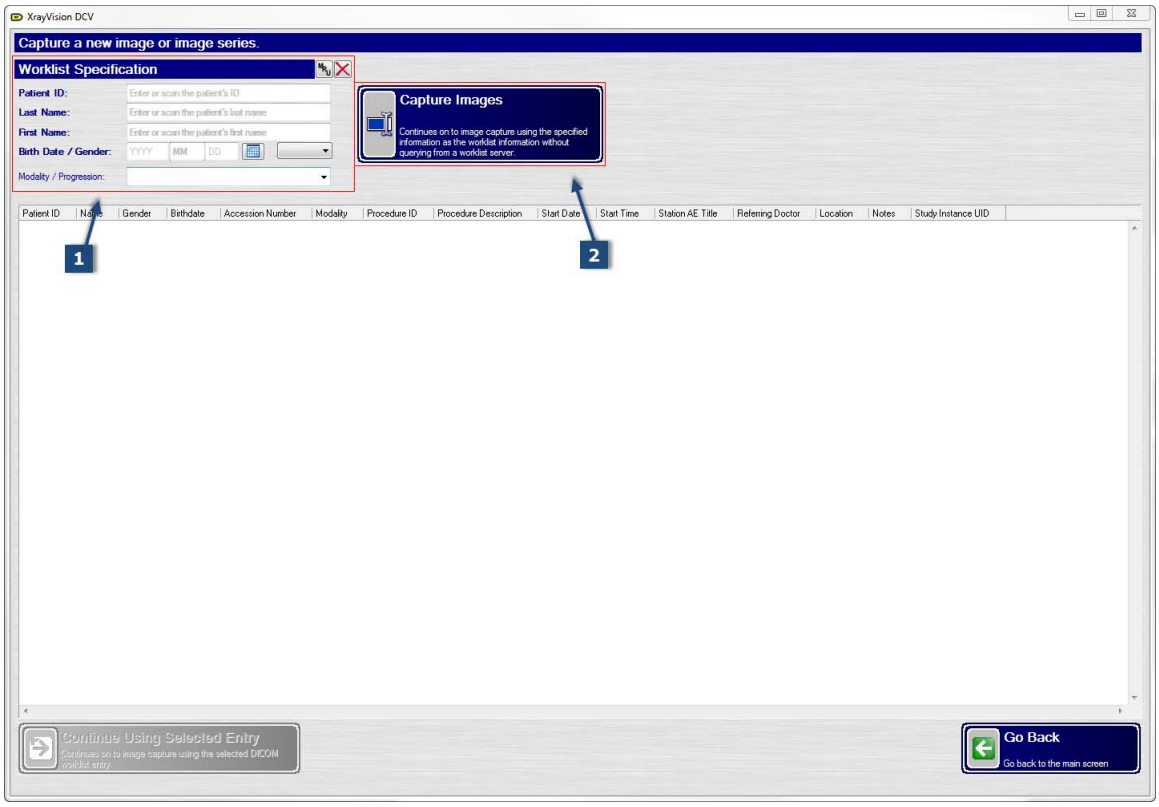


1. **Capture Images:** This option allows users to capture new images for a patient, and store them back to a DICOM server. This option can also be used to add new patients to the DCV database.
2. **View Images:** View existing images for a patient based on a DICOM query.
3. **Advanced User Tools:** Clicking on this button will reveal collection of features that allow the user to perform advanced functions in the DCV application. Some of the features within this menu include: Import Images, and Data Correction. Each of these tools is discussed under Advanced User Tools.

If Image Forwarding has been enabled, there may be a fourth button on the home screen, which appears under the View Images button. This option is normally used only for mobile workstations that are not always attached to their local network.

CAPTURE IMAGES

Interface



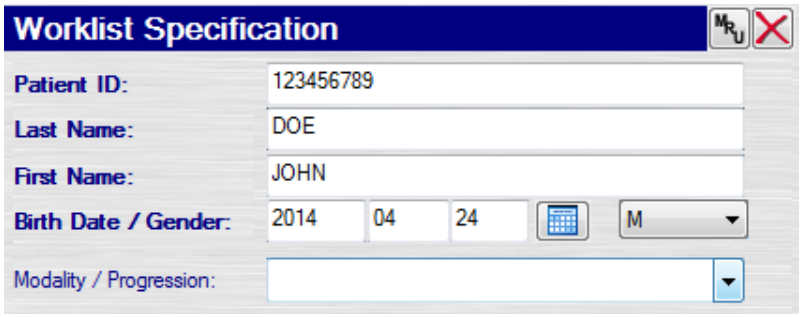
The Capture Images interface has

1. **Patient Information** - In XrayVision DCV, patient information can be entered into the application in several different ways. These methods include:
    - **Manual Entry –** Manual entry is the most basic way to enter patient information into the application. A user will have to type out each required field manually.
    - **Auto-Match List –** The Auto-Match list contains a list of patients who have been seen previously. When three or more characters have been entered, the Auto-Match list will appear, displaying all patients whose information matches the information entered.
    - **Scanning –** In some scenarios, such as military clinics and hospitals, it is possible to use patient ID barcodes to scan patients into XrayVision DCV. For more information about scanning, please contact Apteryx.
    - **Import Patient List –** For clinics that process large amounts of patients at once, a patient list can be set up so that the patients can be automatically added to the auto-match list, allowing for them to be easily found and selected.
    - **MRU List –** The Most Recently Used (MRU) button allows users to quickly select a patient that has recently had images captured or images viewed in XrayVision DCV, preventing the operator from manually entering patient information.
2. **Capture Images –** The Capture Images button will begin the image capture process. The capture process may be started only after all required patient information has been entered.

Entering Patient Information

To manually create a new patient:

1. Select ***Capture Images*** from the home screen.
2. Enter all required patient information. Patient ID, Last Name, First Name, Birth Date and Gender are required all required by default.



To modify the required information settings, click ***Advanced User Tools > Preferences > Data Entry > Worklist Mandatory Data Entry Fields***.

3. Click ***Capture Images***, to begin the capture process.

Until a patient has X-rays taken, they will not appear in the Auto-Match list or Image Query results. For more information on the Auto-Match List, **PLEASE SEE**

Modality/Progression Selection

Modality / Progression is a non-mandatory worklist specification option. This dropdown list allows the user to preselect a specific modality or progressions that they plan to capture.

Modality: *Modality refers to a specific type of X-ray, such as: Panoramic, Cephalometric, Intra-oral, etc.*

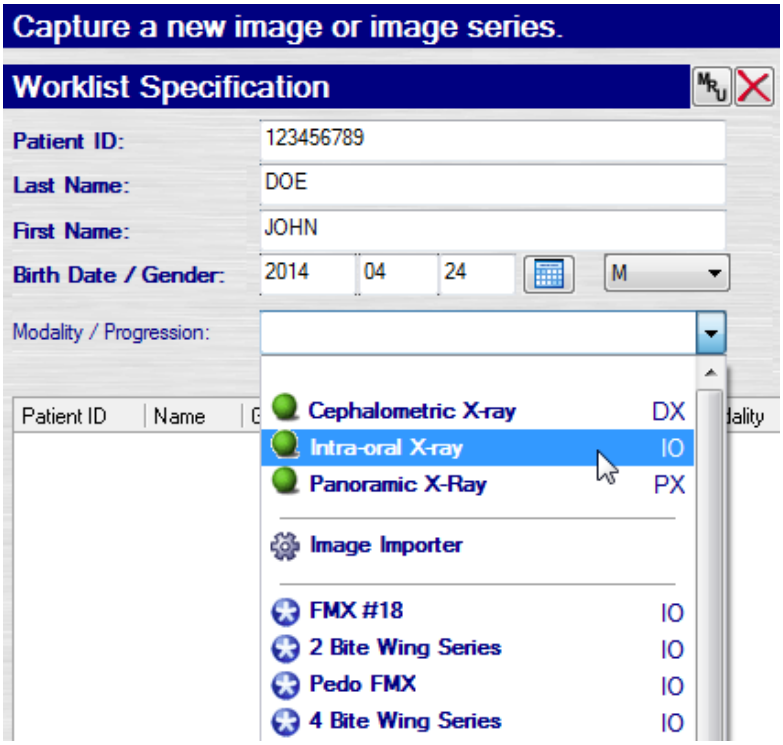
Progression: *A progression is a grouping of study related intra-oral images instead of a rigid arrangement of images. Progression views offer more relational information for each image in the study including their anatomic structure, tooth relationships, and relational positioning to one another.*

SINGLE IMAGE CAPTURE

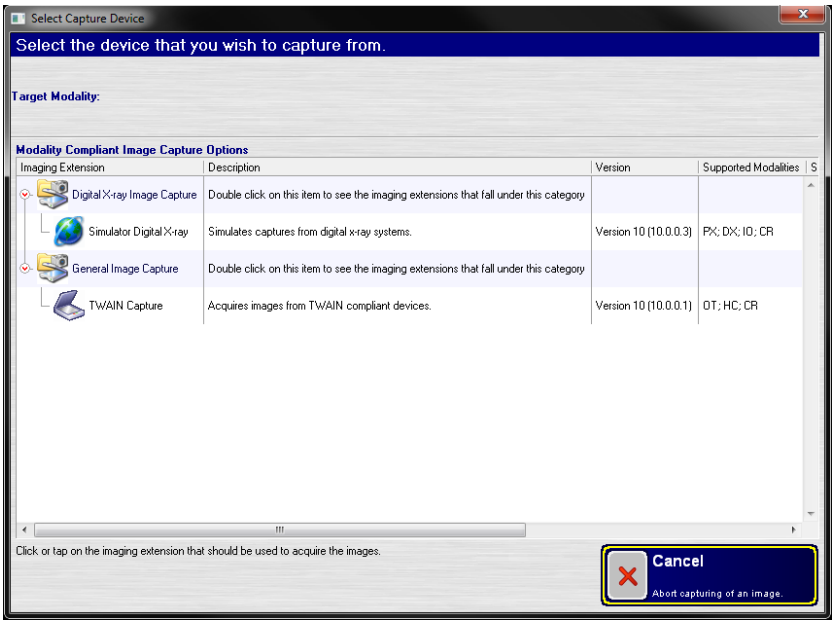
Capturing Single Images from a Sensor

1. Select **Capture Images** on the home screen.
2. Enter all required patient information.
3. From the 'Modality/Progression' dropdown list, select **Intra-oral X-ray**.

If available, users may also select an imaging device from the Modality/Progression dropdown list, allowing them to progress directly to image capture with the selected imaging extension. Imaging extensions may be added to this list in the Preferences portion of XrayVision DCV. Instructions to add capture extensions to this dropdown list may be found in the XrayVision DCV Preferences Manual.

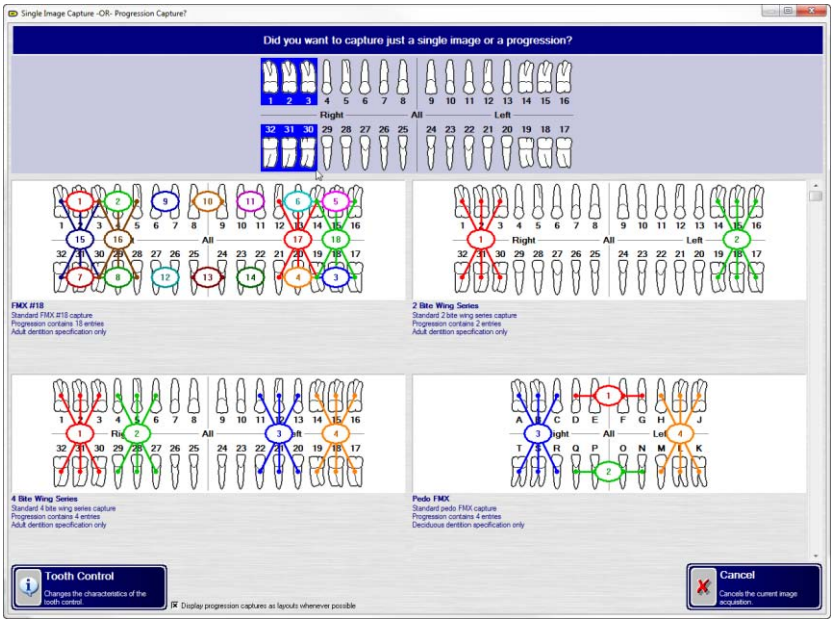


4. Click **Capture Images**.
5. Select the device that you wish to capture from.



This screen appears only for workstations supporting multiple imaging devices.

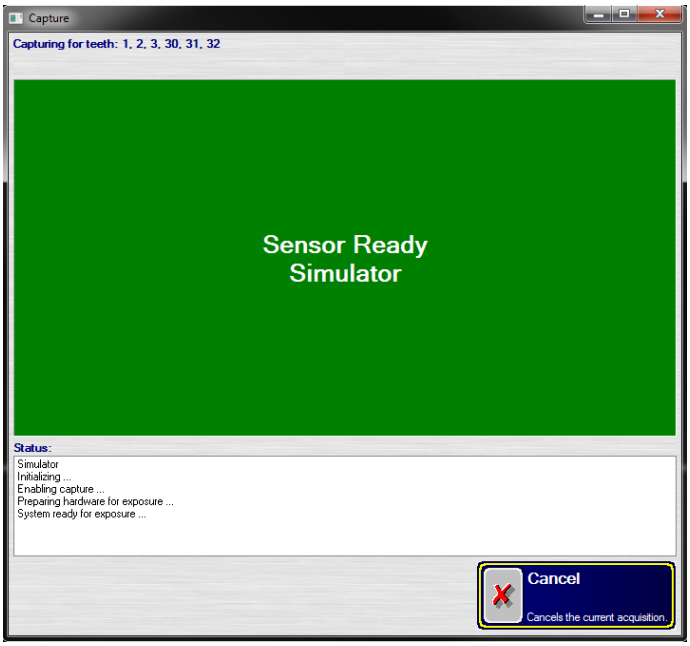
6. The ‘Single Image Capture or Progression Capture’ window will then appear. To capture a single image, select the tooth or teeth to be captured. To begin Progression capture, simply click on the desired progression. Additional information about Progression Capture can be found in the Progression Capture section.



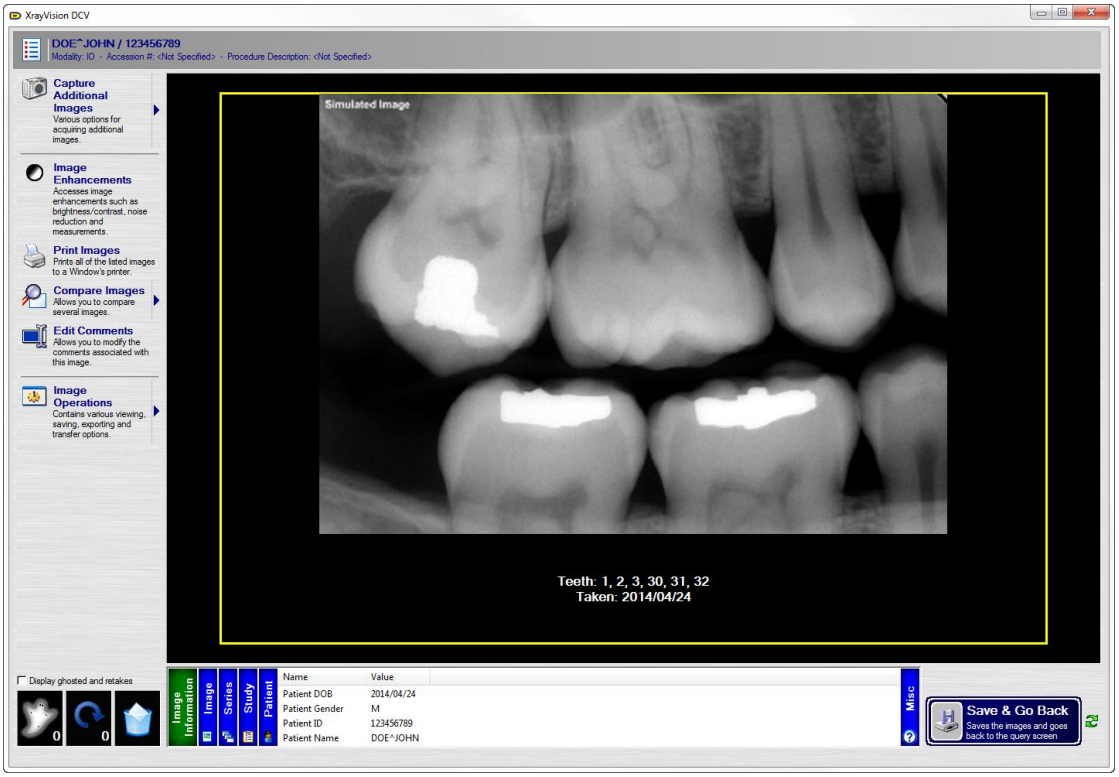
Select a group of teeth by holding down the left-mouse button and dragging the cursor over each tooth in the group. Release the mouse button when complete. Selected teeth will be highlighted in grey.

By default, the ‘Single Image Capture -OR- Progression Capture’ window displays adult tooth controls. To change to deciduous tooth control, click on the ‘Tooth Control Options’ button in the lower right corner to change the tooth display to Deciduous,

7. The software will advance and prepare the sensor for x-ray exposure.
8. The sensor indicator will turn green when the sensor is ready to capture an image. A vocal cue will also be heard if the computer has a sound card and speakers.



9. Capture the x-ray.
10. Once the image has been captured, the application will return to the Image Collection Screen, which displays the captured image.



11. To save the image to the database, press the ‘Save & Go Back’ button. Until the ‘Save & Go Back’ button has been selected, the image can only be viewed from the workstation which the image was captured.

By default, the ‘Modality/Progression’ dropdown list is not a required field. If this field is left blank, users will see another prompt to select a Modality after selecting a hardware extension.

PROGRESSION CAPTURE

General Information

A progression is a grouping of study related intra-oral images, instead of a rigid arrangement of images found in traditional layout-style mounts. Progression views offer more relational information for each image in the study including their anatomic structure, tooth relationships, and relational positioning to one another.

Each progression in XrayVision DCV can be modified using the Progression Editor tool found in the application install directory or in the start menu under **Start > All Programs > XrayVision DCV > Progression Editor.** For more information on the Progression Editor utility, please see the Progression Editor User Guide.

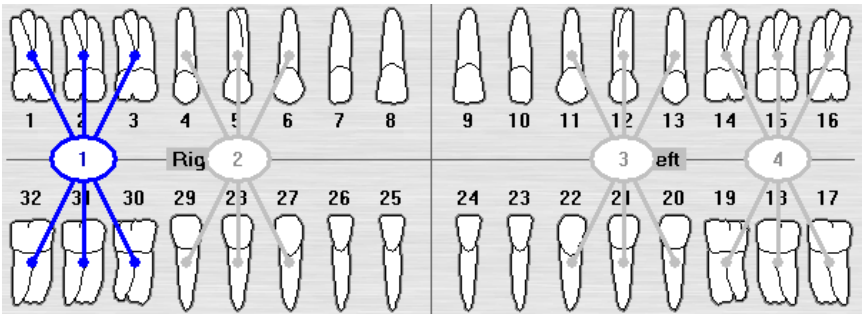
Interface

The Progression Capture interface is designed to allow users to capture a series of images without clicking or additional actions after selecting the **Start Progression Capture** button.

1. **Toolbar:** The toolbar along contains all of the controls for progression capture.
    - **Start Progression Capture -** The stop progression capture button begins the capture sequence. The sensor will automatically ready for each tile, allowing the user to move advance through the progression without clicking between tiles.
    - **Take/Retake Selected Entry –** The take/retake selected entry option is used to capture one image at a time, without the software automatically advancing. This is also used in conjunction with the stop the capture sequence option when retaking an image containing a defect.
    - **Stop the Capture Sequence –** This option will de-activate an active sensor, allowing the capture sequence to be paused or stopped.

- **Image Operations -** Within the Image Operations menu, there are several basic image modifications that can be performed. The operations in this menu include: Rotate 90* clockwise, Flip Vertically, Flip Horizontally, Invert, and Advanced Image Display. Unlike the working tools found in the Image Enhancements screen, these changes are saved.
- **Edit Image Notes –** Edit image notes allows notes to be appended to an image. By default, the image notes field is populated with the tooth numbers contained in the image
- **Done –** The done button will return the images back to the image collection screen, allowing them to be viewed in detail.

2. **Tooth Chart:** The tooth chart displays each shot in of the image so it can be seen anatomically. When a progression tile is selected, the associated shot from the chart above will be highlighted, indicating the current image to be captured.

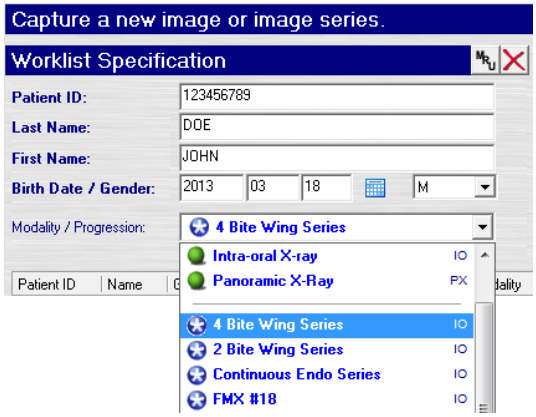


3. **Tiles:** Each image contained within the progression will have a respective tile. The number in the center of each tile associates with the shots represented in the anatomical chart above. Additionally, the tooth numbers are displayed on each tile, reflecting the included teeth in the selected shot.

Capturing a Progression

To capture a Progression:

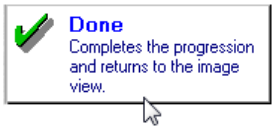
1. Select **Capture Images** on the home screen.
2. Enter all required patient information.
3. From the 'Modality / Progression' dropdown list, select the Progression you will be capturing.



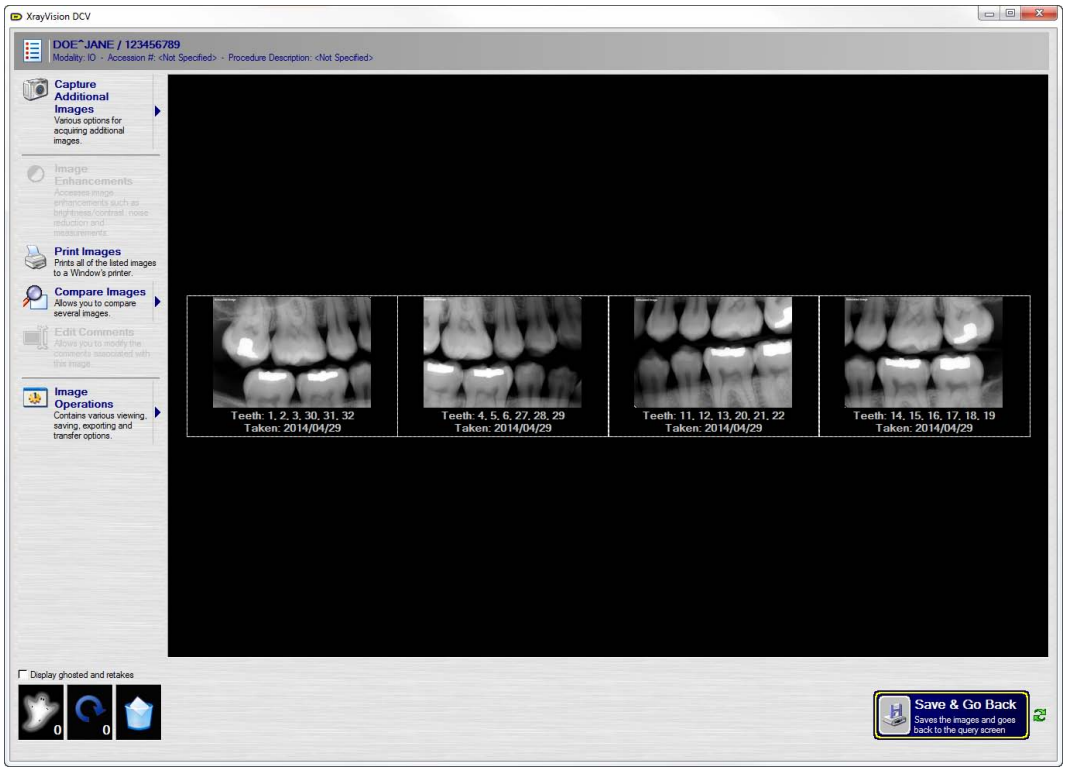
4. Click **Capture Images** to move onto the capture screen.

5. The Progression Capture interface will appear, allowing a user to begin capturing images.

6. Click **Start Progression Capture**. This begins the capture sequence and automatically progresses through the progression without requiring any additional action from the user.
7. Once the entire progression has been captured, click **Done**.



8. The application will return to the Image Collection Screen, which displays the captured images. For more about this interface, see Image Collection interface.



9. To save the images to the database, press the **'Save & Go Back'** button in the lower right-hand corner. Until the 'Done' button has been selected, the image can only be viewed from the workstation which the image was captured. **The 'Save & Go Back' button must be clicked to save images** to the DCV DICOM database.

Retaking an Image

If an image has a defect or otherwise needs to be retaken, the 'Take/Retake Selected Entry' button can be used to recapture the image. To retake an image:

1. Use the **Stop the Capture Sequence** button to pause progression capture.
2. Select the tile that will be retaken by single-clicking on the tile.
3. Reposition the sensor in the patient's mouth
4. Select **Take/Retake Selected Entry**

After a new image has been captured using the 'Take/Retake Selected Entry' button, the application will not progress to the next tile automatically. The next tile must be selected, and the 'Start Progression Capture' button must be used to initiate the automatic capture sequence again.

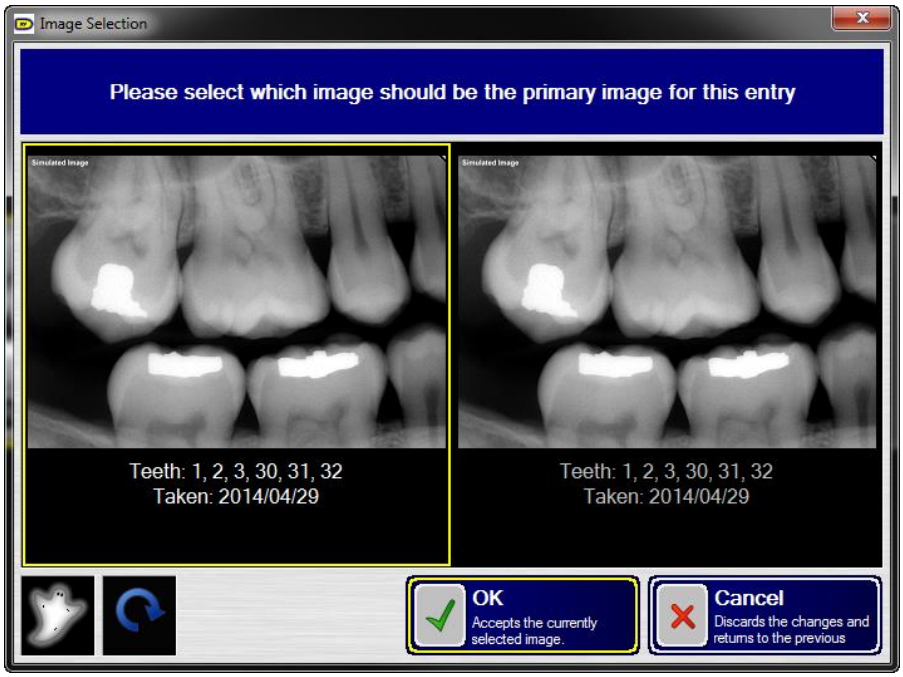
5. Select the next tile for capture and use the **Start Progression Capture** button to initiate the automatic capture sequence.
6. The capture process will automatically continue until the progression is complete. Once the progression capture is complete, select **Done**

Viewing Retaken Images

When an image has been retaken during progression capture, an icon will appear on the image tile, indicating the number of images have been captured for that particular shot. This icon is seen on the tile below:

To view retakes or select a new primary image:

1. Click the multiple images icon, located in the lower right corner of the image tile.
2. The Image Selection screen will appear:

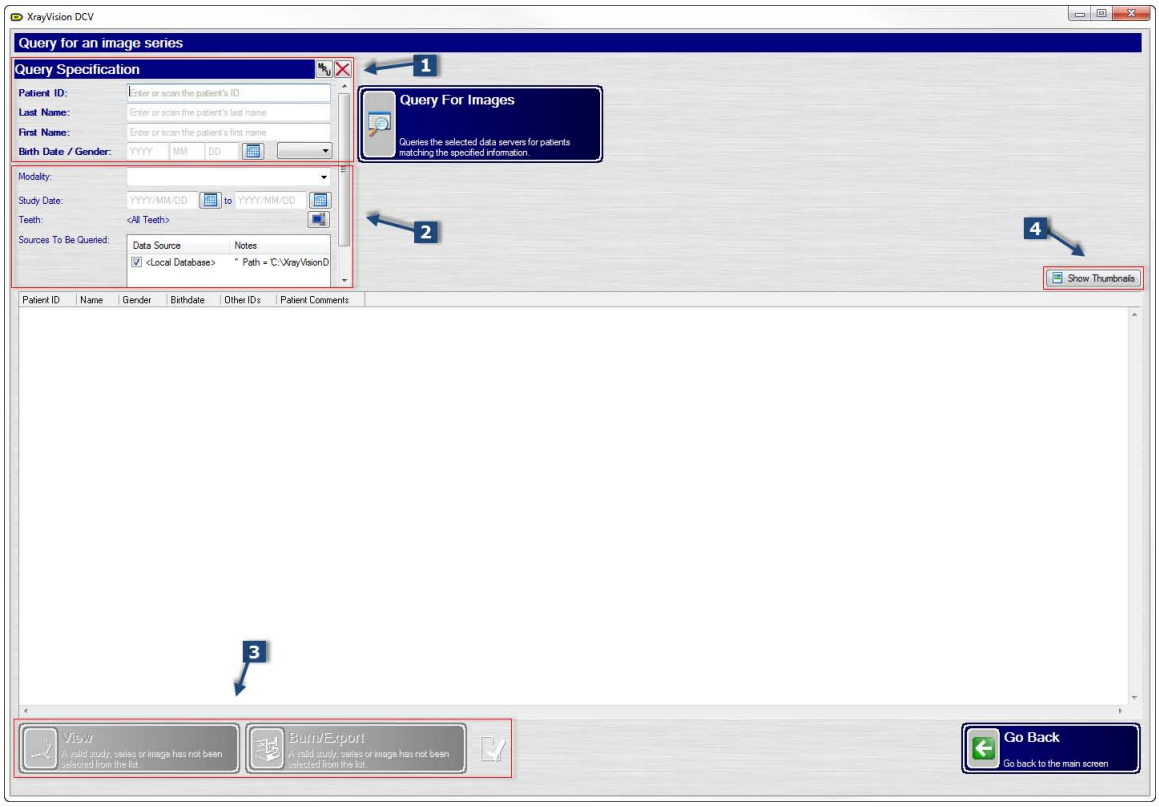


The primary image represented in the progression capture interface will be highlighted in yellow and can be changed by selecting a different image. All other images shown in the Image Selection screen are automatically classified as 'Retaken'.

3. Each retaken image is represented in this interface. The scrollbar along the bottom of the window allows each retaken image to be viewed.
4. Once an image has been selected as primary, click 'OK'.

QUERYING FOR IMAGES

Query Interface



There are four main sections of the Query for Images portion of DCV. These sections include: Patient Information, Image Information, and Result Controls.

1. **Patient Information –** Unlike the Capture Images portion of DCV, there is no required patient information to query for images. The more information provided in these fields, the more accurate the search results will be.

   . As a result of no required information fields, a blank search can be performed that will yield the entire patient database. **This is not recommended**, as it can take a significant amount of time, depending on the size of the patient database.

2. **Image Information –** Aside from patient information, there are several pieces of information that can be used to search for images. These can be used alone, or in conjunction with any other information entered for a search to yield a more accurate search result. These include:

   a. **Modality –** This option allows for an individual Modality to be queried for. This can be used to search for all patients matching a given modality, or all images for a specified patient for a given modality.

   b. **Study Date –** Study date allows all images for a specified date range to be returned in a search. If images have been captured under the wrong patient, this function could be used to locate those images. The calendar icons allow dates to be quickly selected.

   c. **Sources to be Queried –** This option is utilized if there a site uses multiple databases. Any number of DICOM servers may be added to this list, including 3rd party PACS servers.

. It is recommended that only the local database is checked for daily operation. If a master database is left selected, the search time may take dramatically longer depending on the size of the database.

3. **Search Controls** – Once the search result return, there are several actions that can be taken:

   a. **View Patient/Study/Series/Image** – Double clicking on any patient from the search results will expand their file, revealing studies, series, and images, respectively. The 'View' button will reflect the item selected in the search results. For instance, if a patient name is selected, the button will read 'View Patient'.

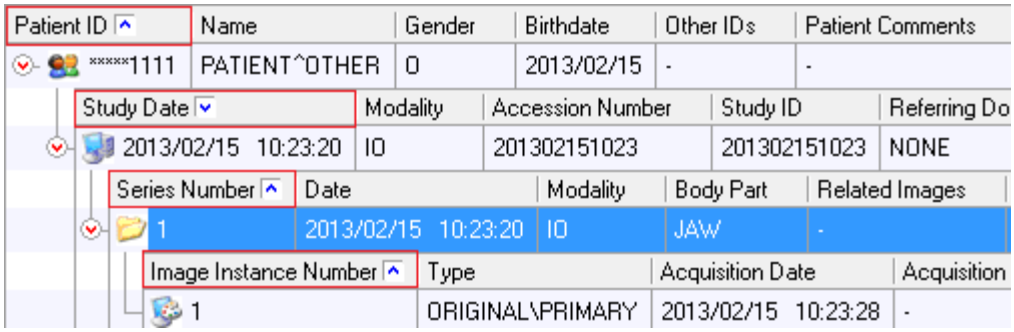
   b. **Burn/Export –** The Burn/Export allows the selected item to be exported or burned to a disk. Images are exported and burned in the DICOM image format, and can be viewed in the included DCV Quick View application.

   c. **Data Correction –** The data correction utility allows patient, study, series, and image information to be modified. For more information on the Data Correction utility, please see the Data Correction User Guide.

4. **Show Thumbnails –** This tool allows users to display a thumbnail of the Patient, Series, Study, or Image that is currently selected. Additionally, users can double-click on a thumbnail to open it in the Image Collection screen.

Query Results

Query results are displayed in the DICOM nesting structure, which displays search results by patient name. Each patient file can be expanded by double-clicking to reveal every study, series, and image associated with the selected patient, as seen below (highlighted in red).



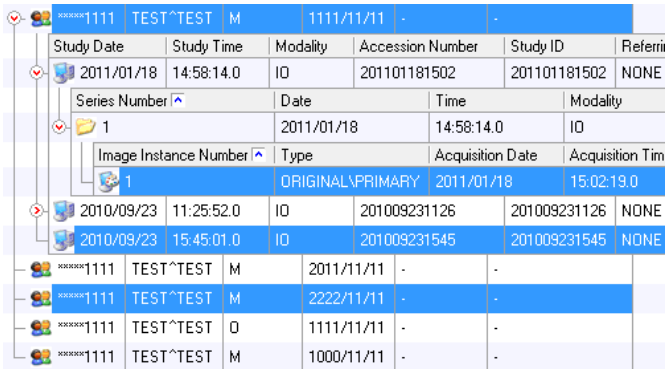
1. **Patient** – Be default, search results are displayed as a listing of patients. ID number, Name, Gender, and DOB are all displayed.
2. **Study** – A study contains all series and images for a patient during one visit.
3. **Series** – Series contains one type of image captured during the patients visit. These types include Bite-Wing Series, Pano's, etc.
4. **Image** – Double clicking on a series will reveal all images contained within that series.

. Multiple patients, studies, series, and images may be selected from the search results using the control key.

Querying for Images

To query for images:

1. Click **View Images** from the home screen of DCV.
2. Enter search criteria. For additional information about search criteria, see the Query Interface section.
3. Click **Query For Images**
4. From the search results, select the desired items to be viewed.



5. Click **View Patients**.

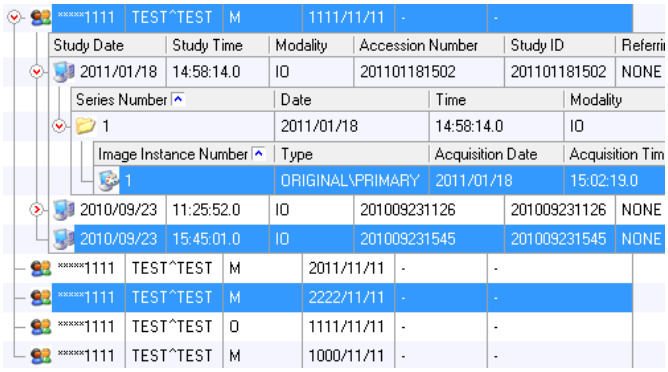
6. The application will then open all of the images in the Image Collection Screen, allowing all selected image thumbnails to be viewed at once. For additional information regarding this screen, see the Image Collection Screen.

Burn / Export

From the image query results, any combination of patients, studies, series, or images can be selected to be burned to a disk. The button seen at the bottom of the Query Results interface will change with the item that is selected.

Burn / Export Patients

1. Click **View Images** from the home screen of DCV.
2. Enter search criteria. For additional information about search criteria, see the Query Interface section.
3. Click **Query For Images**.
4. From the search results, select the desired items to be burned to a disc.

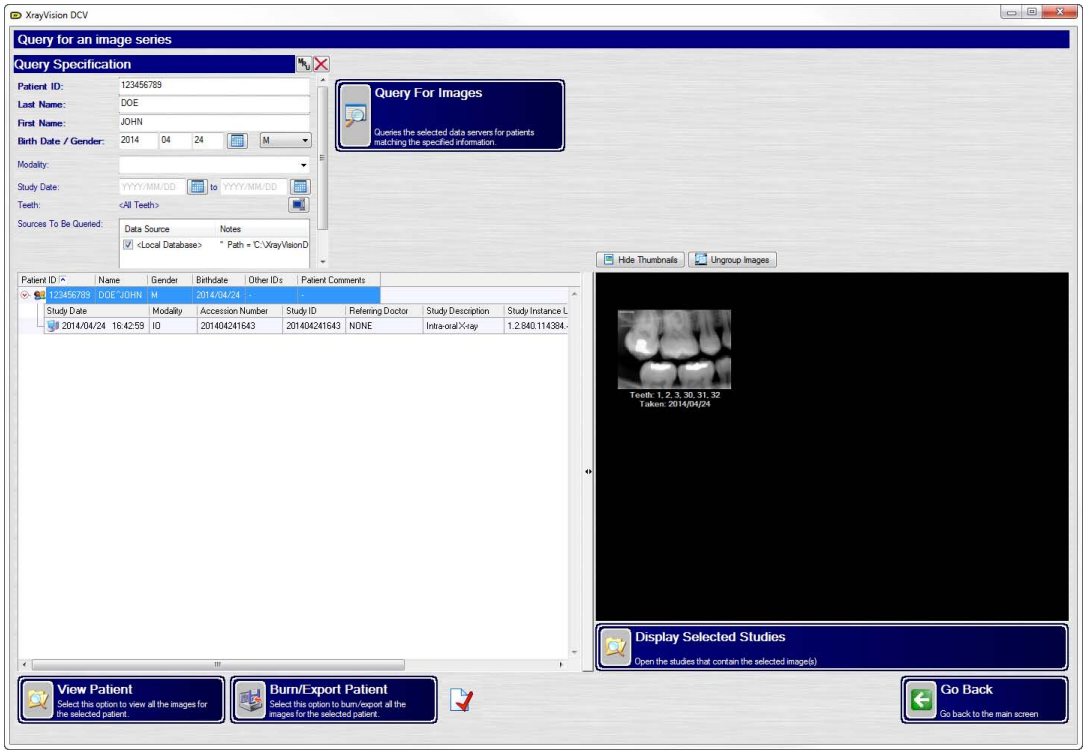


5. Click **Burn/Export Patient**.

6. Choose the appropriate extension to initiate the Burn or Export function.

Show Thumbnails

The Show Thumbnails option allows users to view thumbnails for all images contained in the Patient, Series, Study, or Image that they have selected within the search results. Thumbnail view is ideal for organizations that are concerned with network bandwidth consumption, as well as those that access XrayVision DCV over a WAN. Thumbnail View allows users to quickly select the images that they would like to view, rather than selecting the entire patient and waiting for full resolution images to be downloaded. The thumbnails interface is seen below.

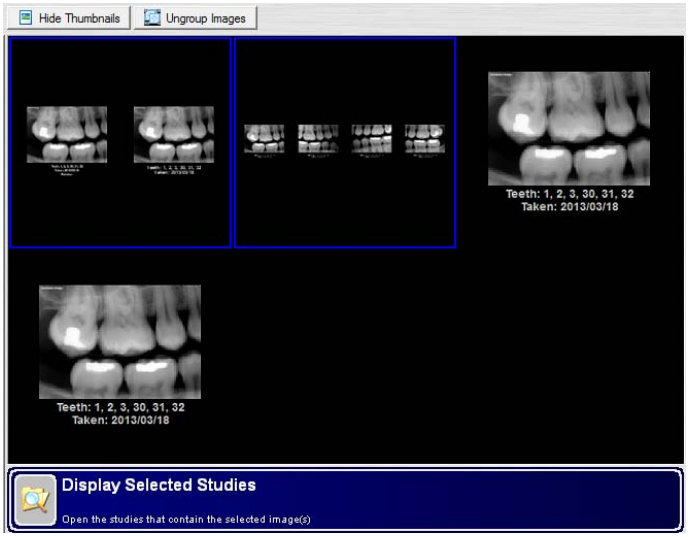


Selecting Thumbnails for Viewing

1. Open XrayVision DCV.
2. Select View Images.

3. Perform an image query.
4. Click the 'Show Thumbnails' button.

5. Left-click to highlight the studies that will be opened.

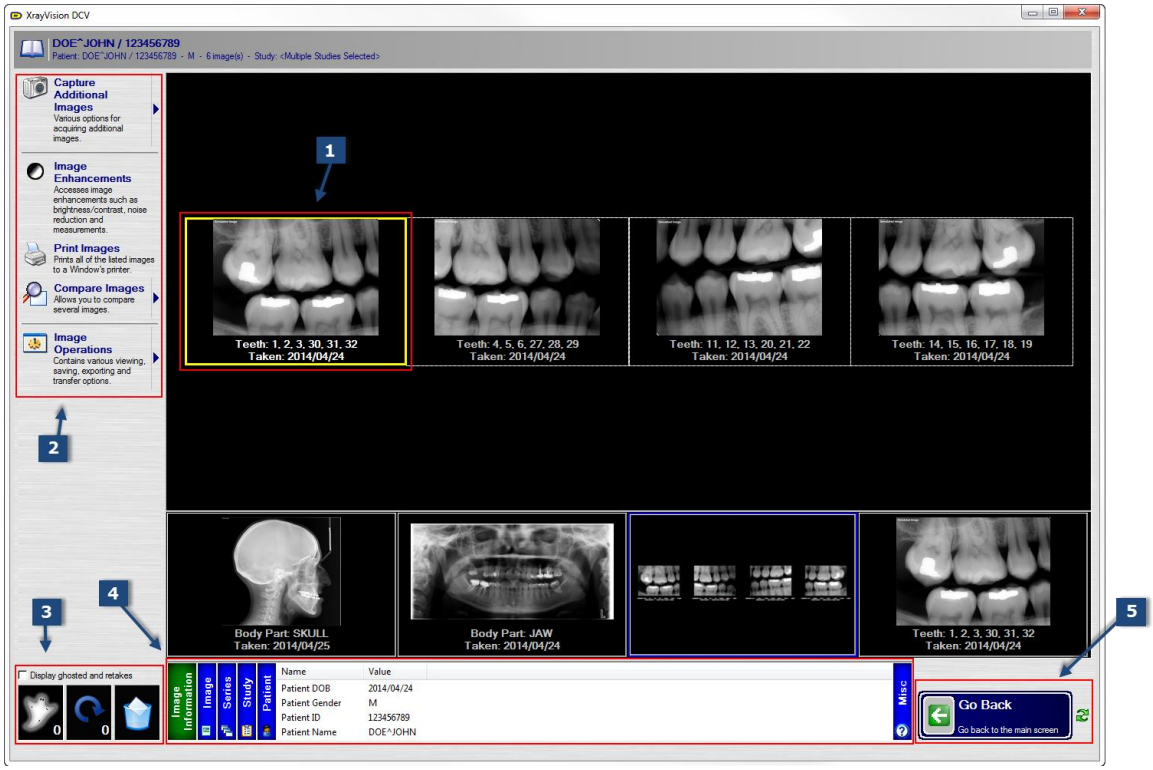


6. Click 'Display Selected Studies.

IMAGE COLLECTION SCREEN

Interface

The Image Collection Screen interface displays all images grouped anatomically, displayed in the traditional mount format. This is designed to give a quick overview of all patient images, and allow for basic functions like printing and image comparison. There are four main sections of this interface: Image Thumbnails, Toolbox, Ghost/Retake Bins, and DICOM Tag information.



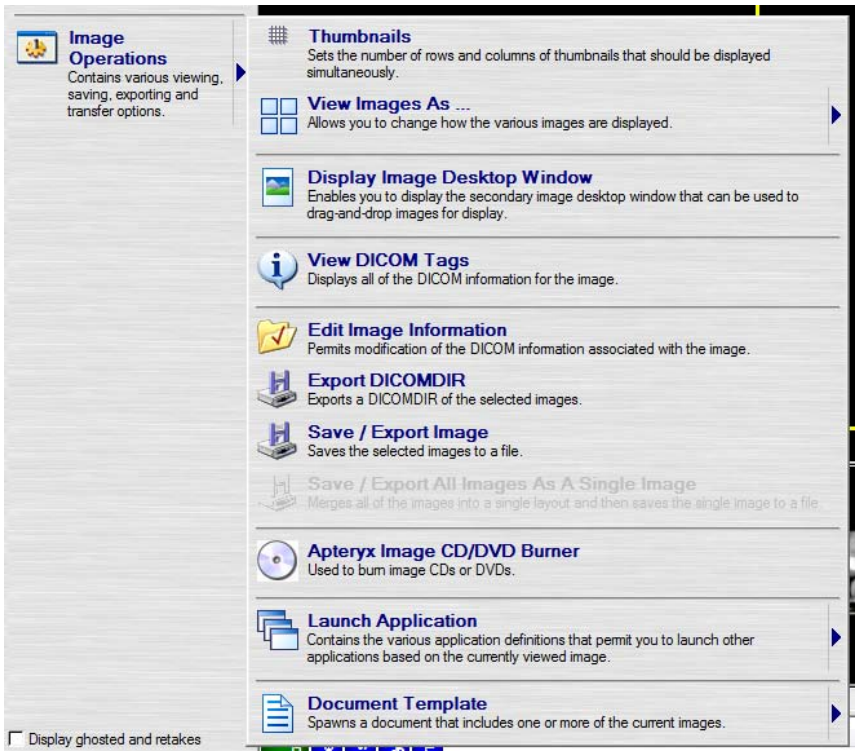
1. **Image Thumbnails:** Each image thumbnail contains image information below the image. When viewing images one single patient, the taken date and teeth associated with the image will be the only information displayed below the image thumbnail, seen in the image tile below.

If images from multiple patients are currently displayed, each patient's Name, ID number, Age, and Gender are displayed along with the teeth associated with the image and the taken date, seen in the image tile below.

2. **Toolbox:** The toolbox contains several functions:

- **Capture Additional Images:** This feature allows for additional images to be captured for a patient without reentering patient information.
- **Image Enhancements:** The Image Enhancements button allows a single image to be selected for additional manipulation and modification. This button performs the same operation as double-clicking on any image tile, which opens the image into the Image Enhancement interface.
- **Print Images:** If there is a printer accessible to the workstation, any selection of images can be selected for printing. For additional information, see **Printing**
- **Compare Images:** Images can be viewed side by side and compared using the Compare Images button. This feature can be used to compare 2, 3, or 4 images at a time. For additional information, see **Compare Images**
- **View DICOM Tags:** XrayVision DCV is a DICOM based application, which attaches patient and image specific information, known as DICOM tags, to every image captured.

- **Image Operations**



i. **Thumbnails:** Thumbnails allows a user to adjust the number of thumbnails displayed simultaneously when viewing images as Thumbnails. When viewing images with the Anatomic grouping, this option allows users to toggle the number of series displayed in the interface.

ii. **View Images As:** These options allow users to change how images are displayed in the application. Users can choose from Grouped Anatomically, Thumbnail display, or a Collection of Images.

iii. **Display Image Desktop Window:** This feature is used on PCs with more than one display. The Image Desktop Window allows users to drag images to a secondary DCV window that can be placed on a different display for reference.

iv. **View DICOM Tags:** This tool displays all DICOM information associated with the selected image.

v. **Edit Image Information:** Edit image information allows the editing of DICOM information associated with a single image.

vi. **Save/Export Image:** Save/Export Image allows an image to be saved outside of our software as a non-DICOM image.

vii. **Apteryx Image CD/DVD Burner:** This function allows all selected images to be burned to a disk. If no images have been highlighted, they will all be burned to the disk.

viii. **Launched Application:** This feature allows a third party application to be configured and invoked directly from the XrayVisionDCV application.

ix. **Document Templates:** Document templates allow users to send selected images to premade document templates that can be modified to include practice information.

3. **Ghost/Retake Bins:** The ghost and retake bins allow images to be 'hidden' from the image collection screen when viewing images. Users may select and drag any number of images to these bins simultaneously.
4. **Image Information:** The image information section appears when a single image has been selected. The selectable tabs include information about the patient, image, series, and study.
5. **Go Back/ Go Home:** The Go Back button allows the user to go back to the previous window. Using the green arrow icon, the button can be toggled to a Go Home button, which will take a user directly back to the home screen of the application.

Capture Additional Images

The 'Capture Additional Images' option allows users to begin capturing images for the current patient without having to reenter patient information. After selecting **Capture Additional Images**, the application will then progress through steps 5-12 of the Capture Process.

This function can only be used for a single patient. If images from multiple patients are displayed, the Capture Additional Images feature is disallowed.

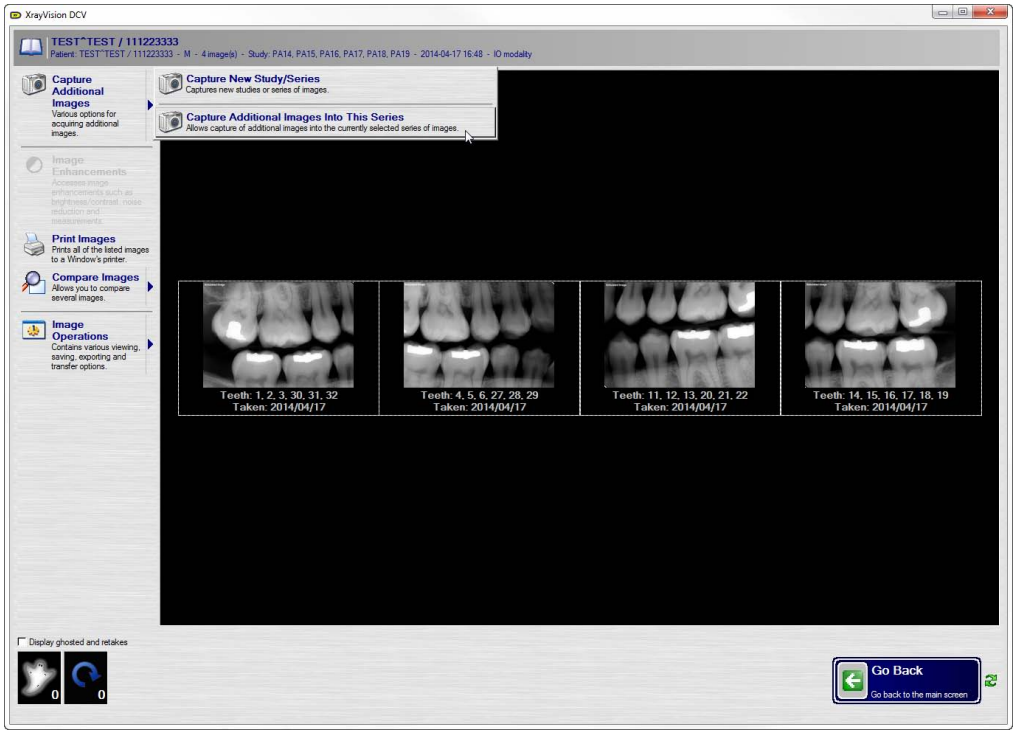
1. **Capture New Study/Series:** This option allows users to capture a new series.

2. **Capture Additional Images Into This Series.** This option allows users to users to capture additional images into the currently selected series.

   This option must be enabled in the XrayVisionDCV preferences. If it has not been enabled, the application will progress directly into the capture process for a new series.

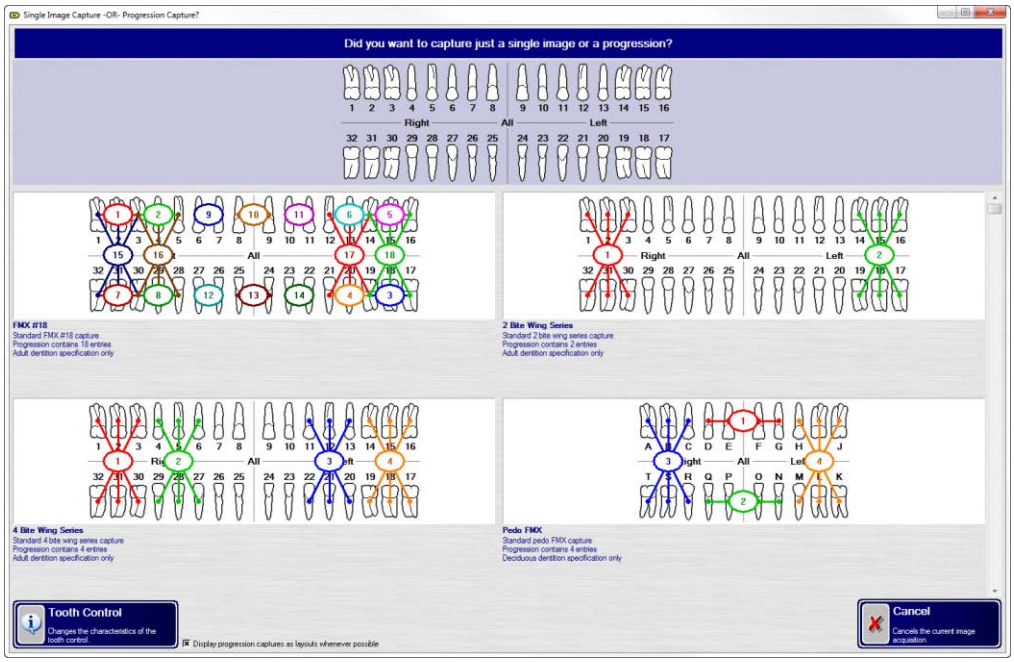
Capturing additional images into an existing series

1. Click **View Images** from the home screen of DCV.
2. Enter search criteria. For additional information about search criteria, see the Query Interface section.
3. Click **Query For Images**.
4. From the search results, highlight the desired patient and click **View Patient**.
5. Click '**Capture Additional**'.
6. Click '**Capture Additional Images Into This Existing Series**'.

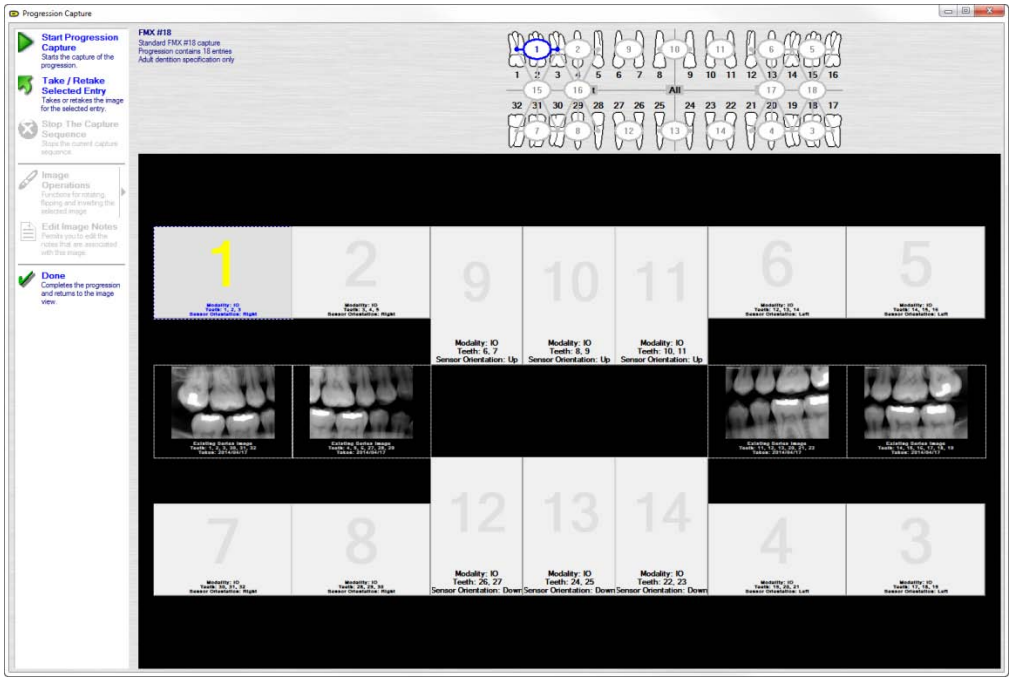


7. Choose an Imaging Extension.
8. Choose a Modality.

9. Select a shot or progression that you'd like to capture.

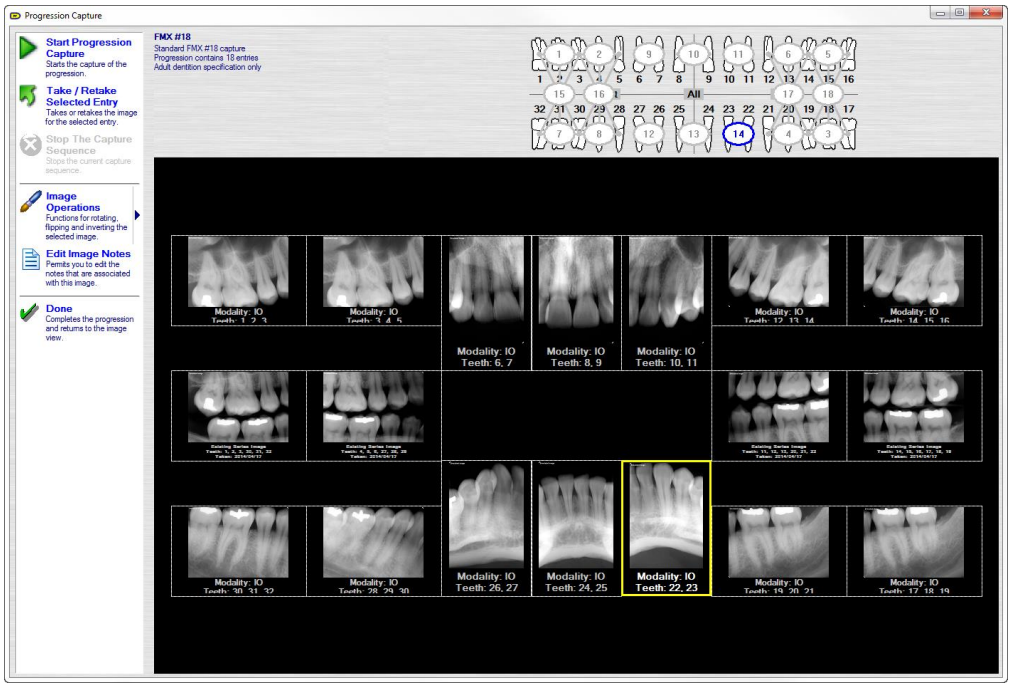


10. Click **Start Progression Capture** to begin capturing new images.



During progression capture, any images from the existing series that match tiles in the newly selected template will be displayed during progression capture, as seen above. These existing images will be labeled as 'Existing Series Image' and cannot be modified, and are displayed for reference only.

11. When finished, click '**Done**'.



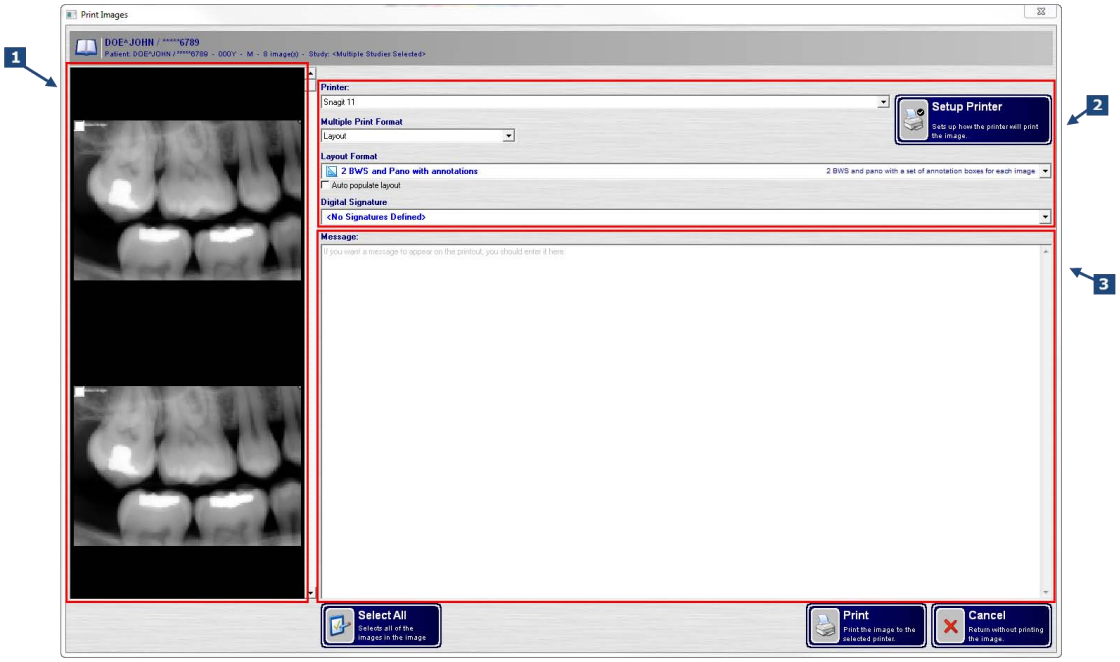
12. The application will return to the Image Collection Screen, which displays the captured images. For more about this interface, see Image Collection interface.
13. To save the images to the database, press the **'Save & Go Back'** button in the lower right-hand corner. Until the 'Done' button has been selected, the image can only be viewed from the workstation which the image was captured. **The 'Save & Go Back' button must be clicked to save images** to the DCV DICOM database.

Image Enhancements:

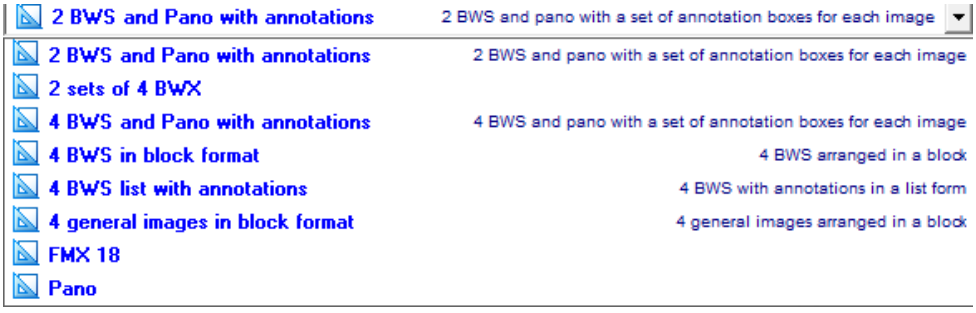
The Image Enhancements button allows a single image to be selected for additional manipulation and modification. This button performs the same operation as double-clicking on any image tile. For additional information regarding the Image Enhancement interface, see Image Enhancement

Print Images

Workstations with print capabilities have the ability to print single images and layouts from using the Print Images function. Images can be printed in several formats or layouts based on user specification.



1. **Image Thumbnails**: Thumbnails of all images associated with a patient will be displayed along the left portion of the Print Images window. These can be selected for printing using the checkbox found the corner of each thumbnail.
2. **Setup Configuration:** The printer and document type can be selected using the Printer, Multiple Print Format, and Layout Format dropdown lists.
    - **Printer**: Each printer and document application located on the machine will be listed here. Users may send a document to a printer or file location on their computer.
    - **Multiple Print Format**: This controls the type of document that will be used for printing. Images can be printed with 1-5 images per page, a contact sheet, or in layout format.
    - **Layout Format**: If 'Layout' is selected in the Print Format dropdown list, this option will become available. Using this option, users may select a traditional mount to place images into for printing. The layouts found in this can be seen below:



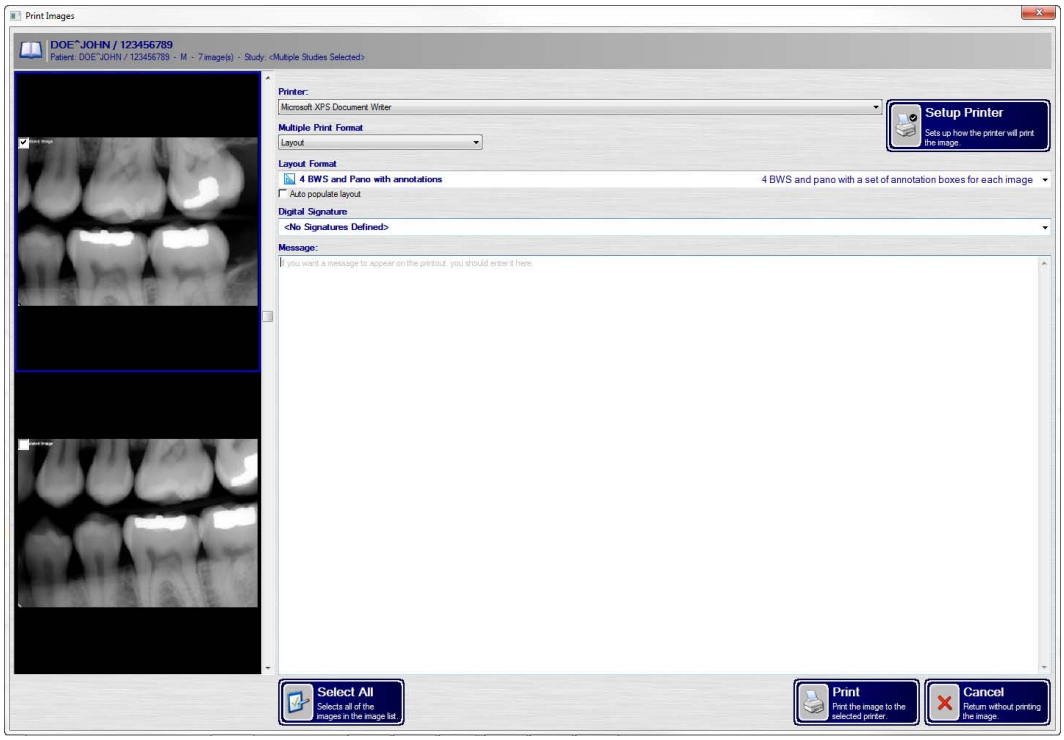
3. **Message:** The Message field allows notes and text to be appended to a printed document.

Printing a Layout

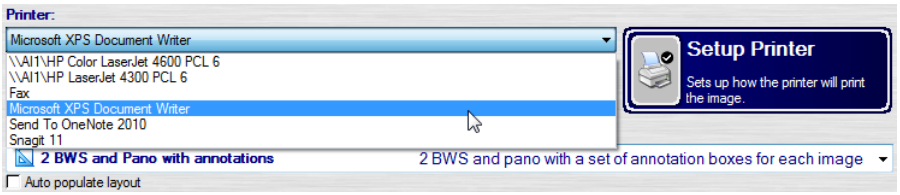
To print images in a layout:

1. Select 'Print' from the Image Collection screen.

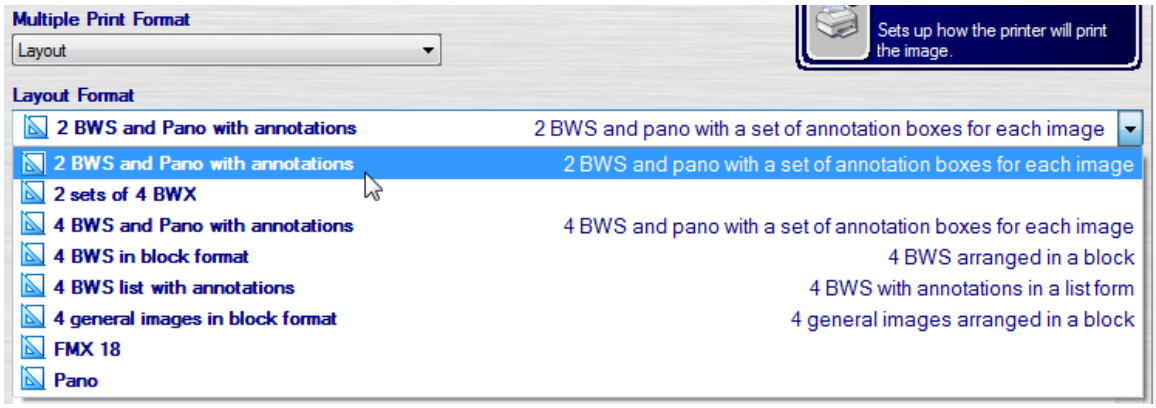
2. The Print Images interface will appear. Select the images to be included for printing using the checkbox on the image tile.



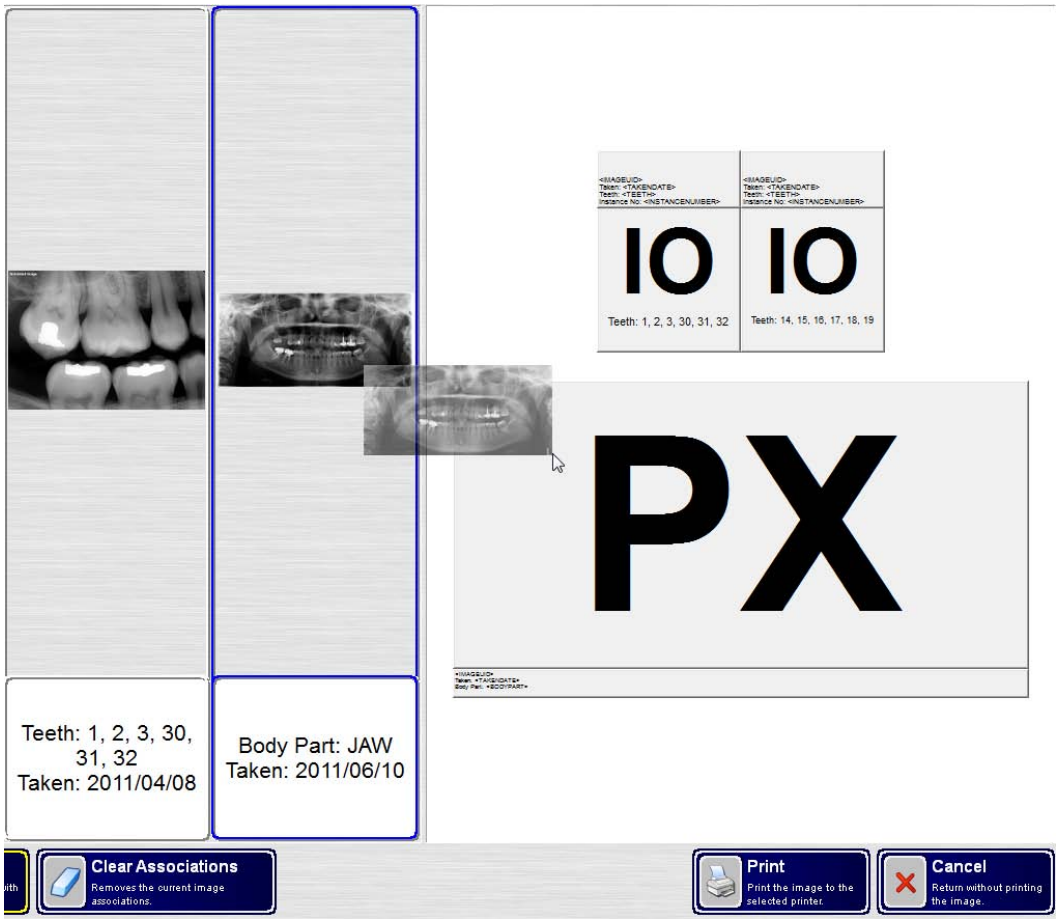
3. Select your printer.



4. From the 'Multiple Print Format' dropdown list, choose **Layout.**
5. From the 'Layout Format' dropdown list, select your desired layout.



6. Select **Print.**
7. The Print Layout interface will appear, showing the layout format specified in Step 5. Left-click and drag each image into the respective position in the layout.

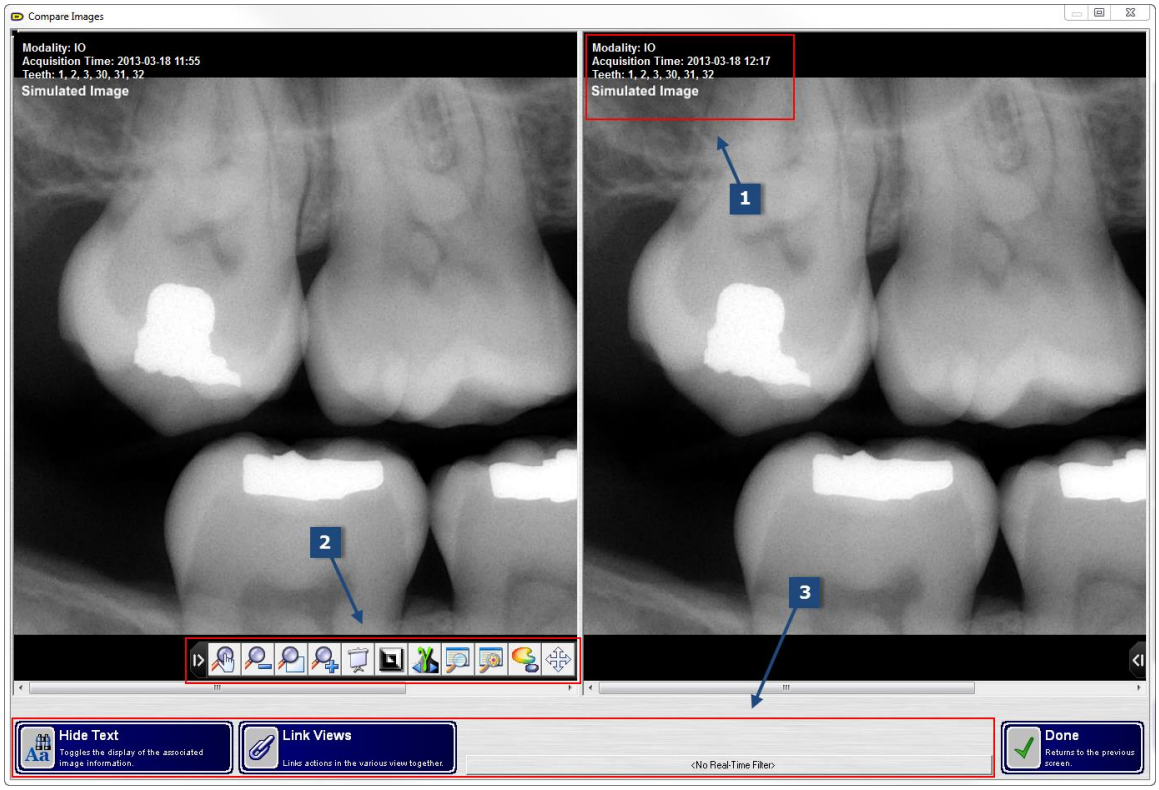


If no images have been added to the layout by dragging or using the Auto-Populate function, the print job will yield a blank page.

8. Click 'Print' to send the layout to the specified destination.

Compare Images

Images can be viewed side by side and compared using the Compare Images button. This feature can be used to compare 2, 3, or 4 images at a time.



1. **Image Information**

   When comparing images, a set of image-specific information is displayed in the upper right-hand corner of the image tile. This information includes: Modality, Acquisition Time/Date, and Teeth Association.

   Image information can be hidden using the Hide Text button, located in the Toolbox.

2. **Pop-out Toolbars**

   The Compare Images interface contains the same pop-out toolbars found in the Image Enhancement interface. These toolbars contains several enhancements, which include: zoom, gamma adjustment, brightness/contrast, and spot enhance. More information can be found in **Pop-out Toolbars and Enhancements.**

3. **Toolbox**

   The toolbox contains three tools:

   - **Hide Text** – Hide Text will hide all image information displayed in the upper left-hand corner of the image tile.
   - **Link Views –** Link views allows a single enhancement action to be applied to all images displayed. All images can be simultaneously zoomed, enhanced, or filtered using the pop-out toolbar from any image.
   - **Real-Time Filters –** Real-Time Filters are preset filter algorithms that can be applied to images. These filters, when applied, remain applied until they are turned off.

Compare Selected Images

Images can be viewed side by side and compared using the Compare Images button. This feature can be used to compare 2, 3, or 4 images at a time. To compare images:

1. Select 2, 3, or 4 images to compare by single-clicking on each image.
2. Click 'Compare Images'
3. The Compare Images interface will appear, displaying each selected image side by side.

Each image window contains a pop-out toolbar that can be used to perform basic enhancements to an image. The 'Link Views' button in the bottom right corner of the window allows a single enhancement to be applied to each image. For additional information about the pop-out toolbars, see: **Image Enhancement**

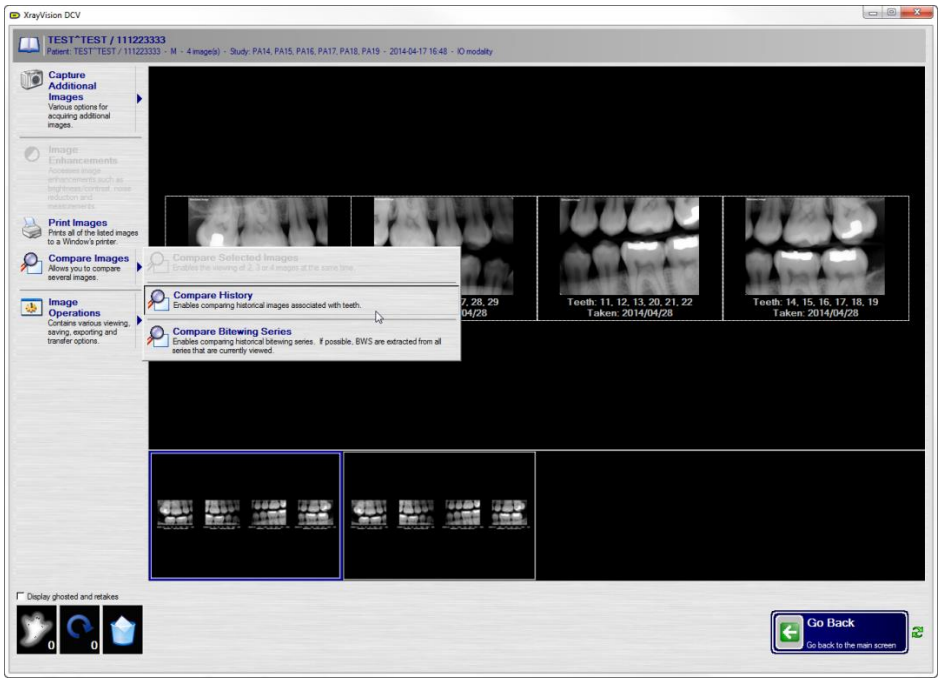
4. To close the Compare Images window, click **Done**.

Compare History

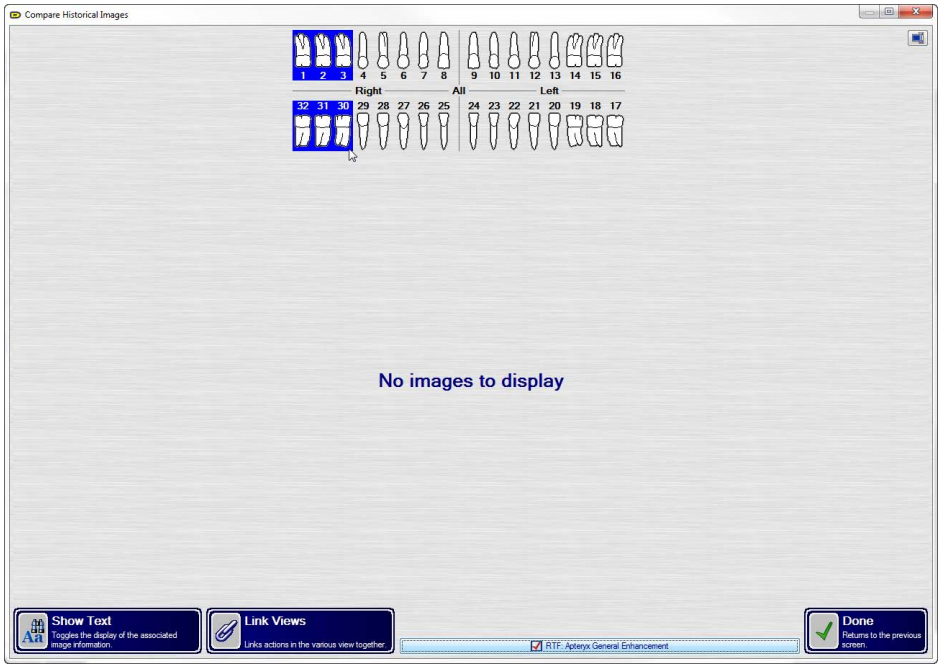
The history of a specific tooth or selection of teeth can be compared easily using the Compare History tool. This tool displays all teeth associated with a selected anatomical region automatically. To compare history:

1. Click **View Images** from the home screen of DCV.
2. Enter search criteria. For additional information about search criteria, see the Query Interface section.
3. Click **Query For Images**.
4. From the search results, highlight the desired patient and click **View Patient**.
5. Click **Compare Images**.

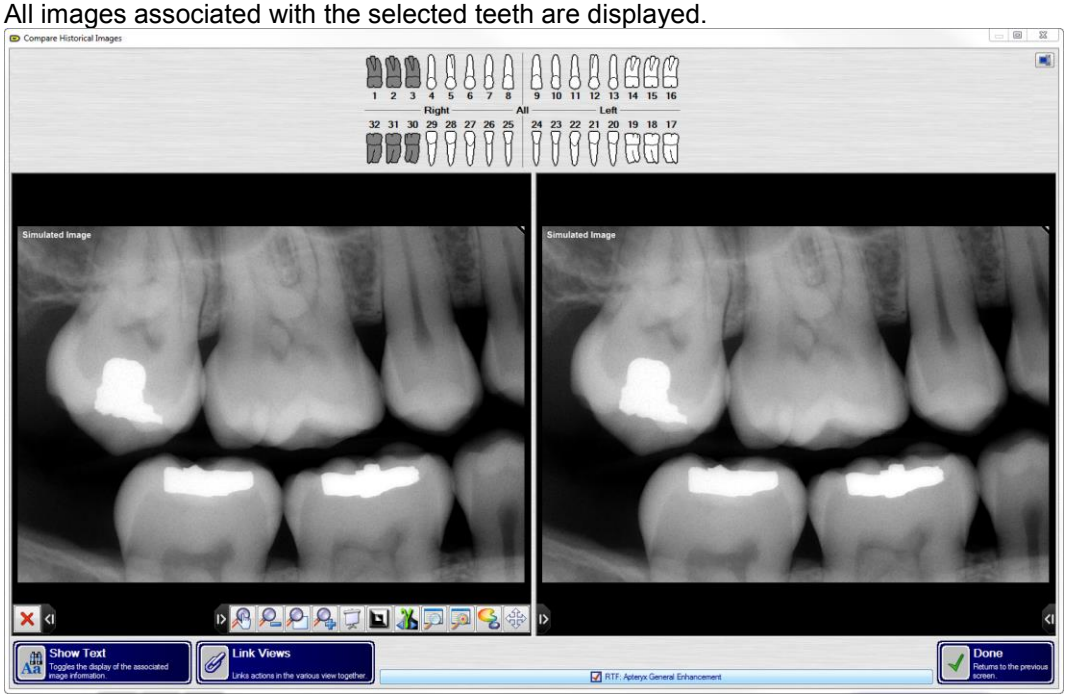
6. Click **Compare History**.



7. Using the anatomical chart provided, select a tooth or click and drag the mouse across a selection of teeth to be compared.



8. All images associated with the selected teeth are displayed.



9. Using the pop-out toolbars in the lower corners of each image tile. For more information about the tools included in the pop-out toolbars, see the Pop-out Toolbars section.

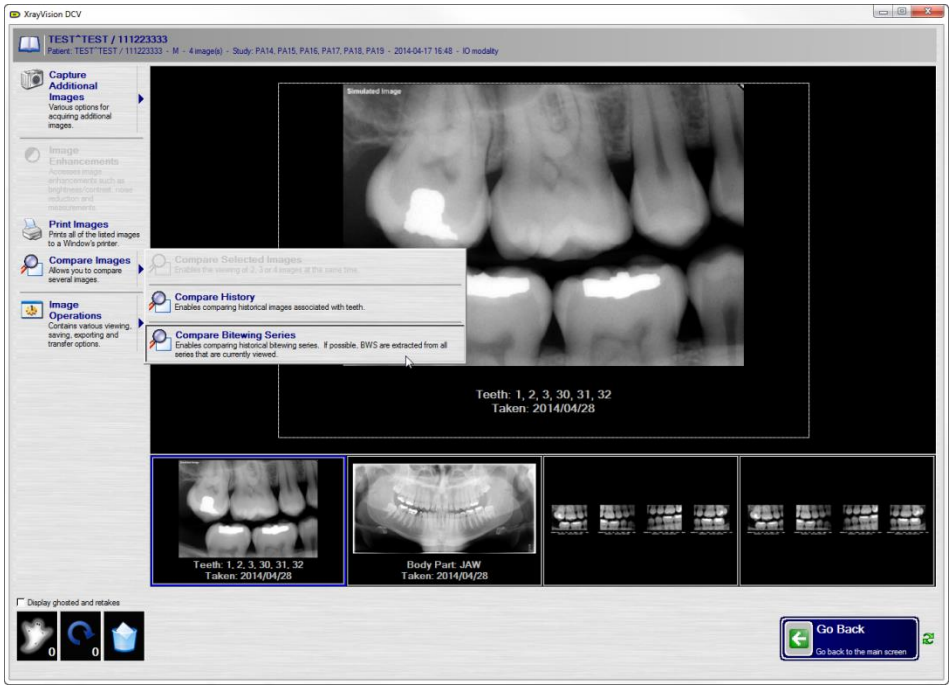
10. When finished, click **Done**.

Compare Bitewing Series

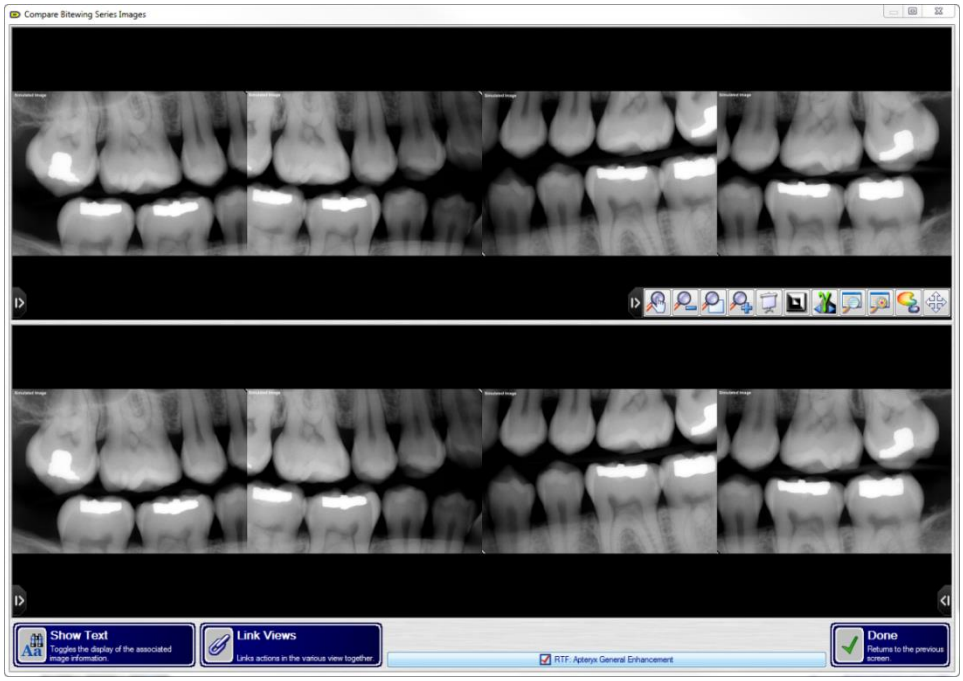
Compare Bitewing Series allows users to quickly compare entire sets of bitewings. To compare bitewings:

1. Click **View Images** from the home screen of DCV.
2. Enter search criteria. For additional information about search criteria, see the Query Interface section.
3. Click **Query For Images**.
4. From the search results, highlight the desired patient and click **View Patient**.
5. Click **Compare Images**.

6. Click **Compare Bitewing Series**.



7. All bitewing series are displayed for comparison.



8. Using the pop-out toolbars in the lower corners of each image tile. For more information about the tools included in the pop-out toolbars, see the Pop-out Toolbars section.

9. When finished, click **Done**.

Thumbnails

The thumbnail control sets the number of rows and columns that are displayed at once. As many as 8 columns x 6 rows or as few as a single image can be displayed. This change is made on a per-computer basis, allowing every computer with XrayVision DCV to specify different thumbnail settings. To change the thumbnail display settings:

1. Click **Thumbnails.**
2. The Thumbnail Rows and Columns window will appear, as seen below:

3. Without clicking, the mouse can be dragged over the chart, allowing the row and column combination to be selected for use.
4. After highlighting the desired dimensions, click the tile to finalize the selection.

When images are organized using the anatomic grouping, adjusting the number of columns will control the number of series displayed along the bottom of the window.

View DICOM Tags

XrayVision DCV is a DICOM based application, which attaches patient and image specific information to every image captured, known as DICOM tags. The DICOM Tag button displays every piece of DICOM information associated with a single image.

DICOM tags contain image specific information about the image file, image, hardware, and patient information.

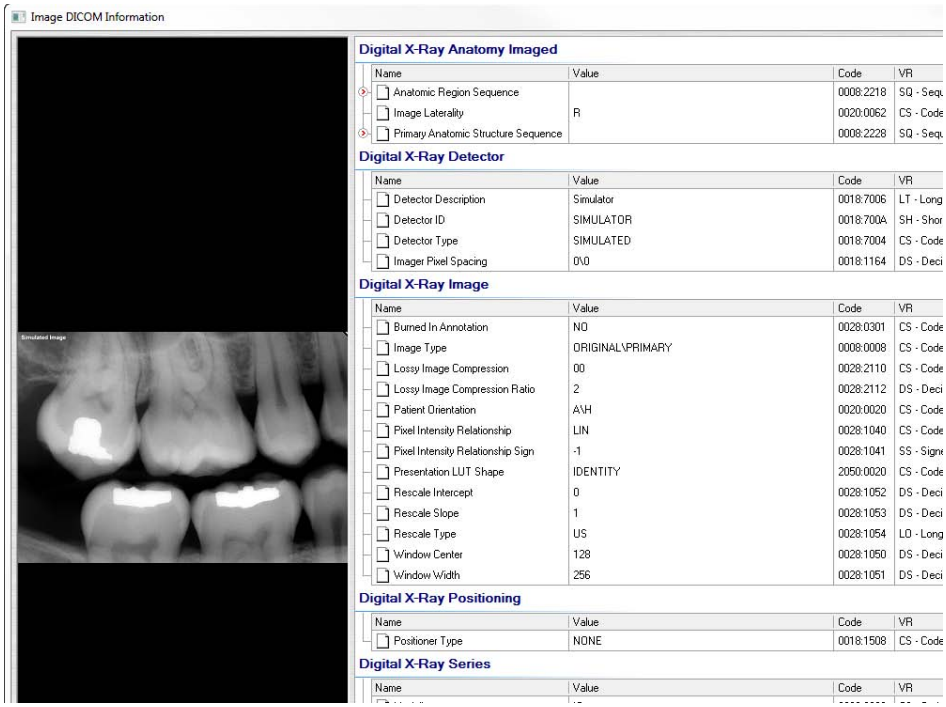
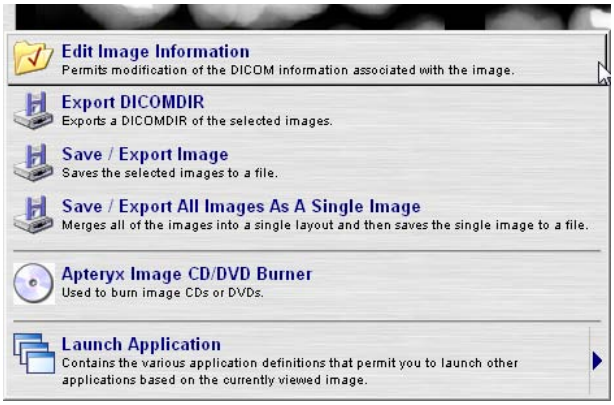


Image Operations

The Image Operations menu contains utilities that allow users to edit image information, export images, and burn images to a disk.



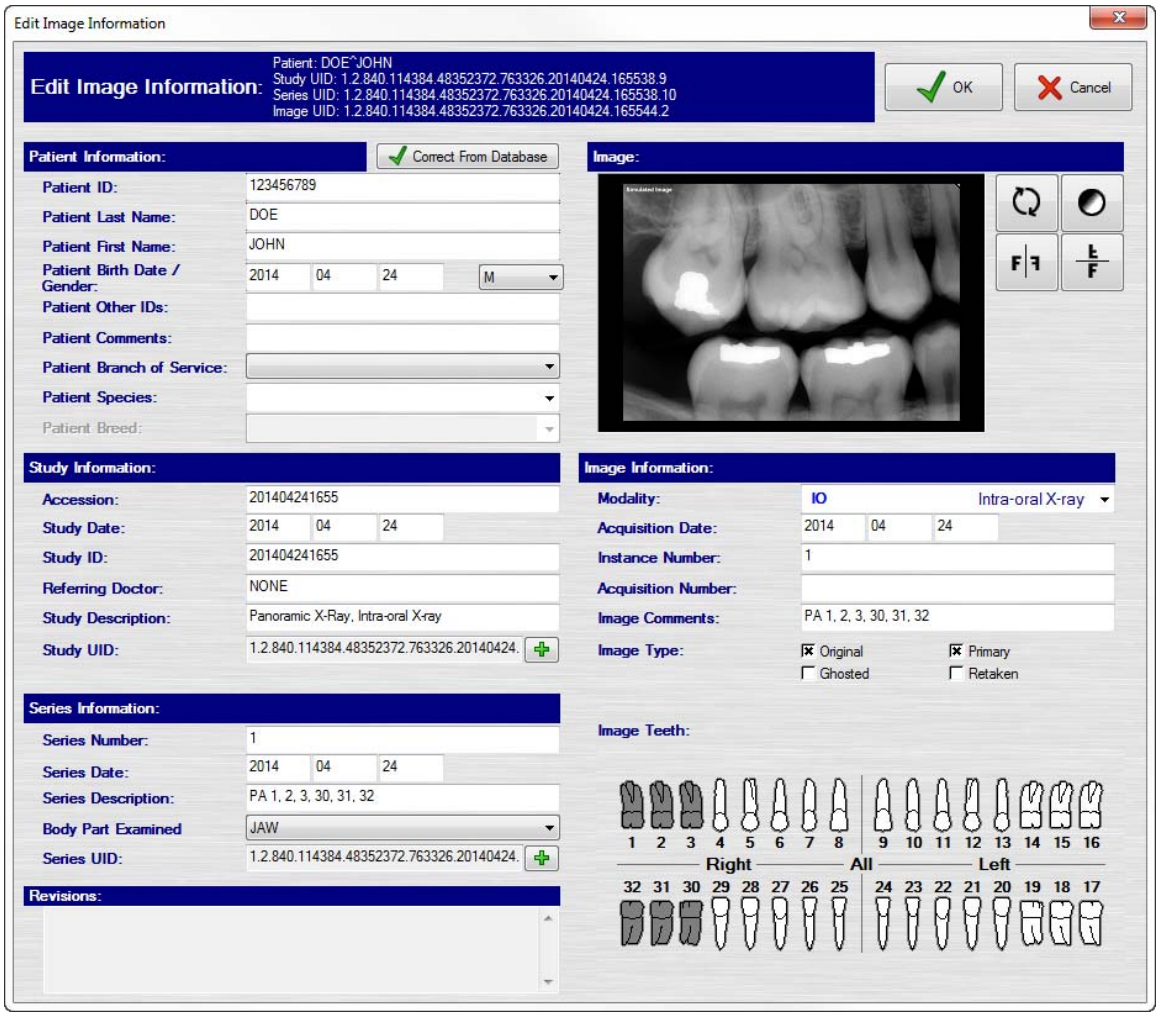
- **Edit Image Information:** Edit image information allows the editing of DICOM information associated with a single image.
- **Save/Export Image:** Save/Export Image allows an image to be saved outside of our software as a non-DICOM image.
- **CD/DVD Burner:** This function allows all selected images to be burned to a disk. If no images have been highlighted, they will all be burned to the disk.

Editing Image Information

1. Highlight the image thumbnail whose DICOM information is to be modified.

   Only one image may be edited at once using the Edit Image Information tool. If multiple images have been selected, this tool will become unavailable. To correct multiple images simultaneously, please see Appendix 2 – Data Correction

2. Click **Image Operations**
3. Select **Edit Image Information**
4. The Edit Image Information interface, seen below, will appear, allowing the modification of Patient, Study, Series, and Image information. Additionally, the image orientation and tooth association can be changed.
5. Click 'OK' to save any changes made.



Save / Export Image

Images can be exported and saved outside of XrayVision DCV using the Save / Export Image utility. Exporting images is commonly used when emailing images, or if the user would like to save labels and enhancements placed on an image outside of our application for reference. Users can choose to save/export images as individual images using the **Save/Export Image** option, or as a combined single image using the **Save/Export All Images as a Single Image utility.**

Several image file types can be selected within the Export Images interface: jpeg, tiff, bmp, and DICOM.

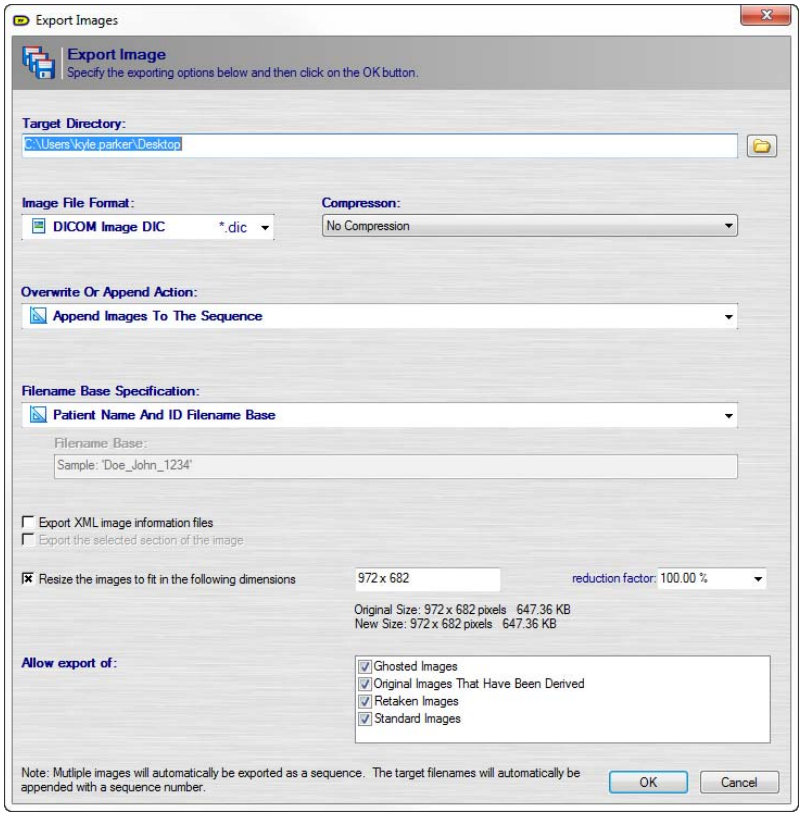
⚠ Warning: DICOM files should never be emailed! Every DICOM file contains the associated patient's first name, last name, date of birth, and social security / ID number. Given the insecure

nature of email, only jpeg, bmp, and tiff should be used in favor of DICOM, as they do not contain any patient information.

Because jpeg, bmp, and tiff do not contain DICOM information, there are several filename base specifications which can place non-sensitive patient information in the filename so it can be recognized outside XrayVision DCV.

Exporting Images

1. Highlight the image thumbnail(s) to be exported.
2. Click **Image Operations**
3. Select **Save / Export Image**
4. From the Export Images interface, seen below, users can specify the target directory, file type, as well as file name.



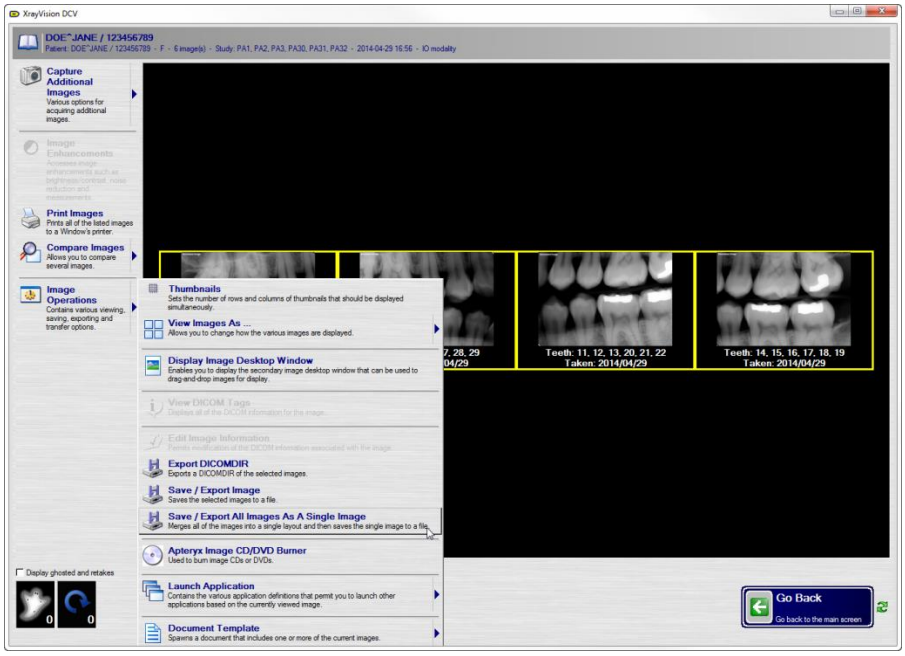
Note: Users can choose to ignore Ghosted, Retaken, and Derived images during export using the 'Allow Export Of' section.

5. Click **OK** to export the selected image(s).

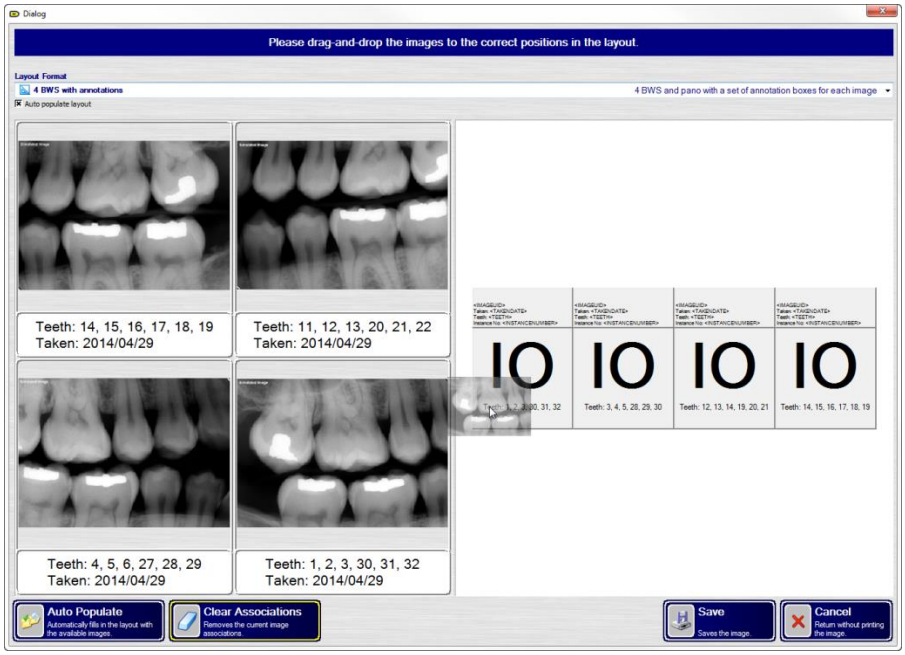
Exporting Images as a Combined Single Image

Images can also be exported as a combined single image, rather than individual images.

1. Highlight the image thumbnail(s) to be exported.
2. Click **Image Operations**.
3. Click **Save/Export All Images As A Single Image**.

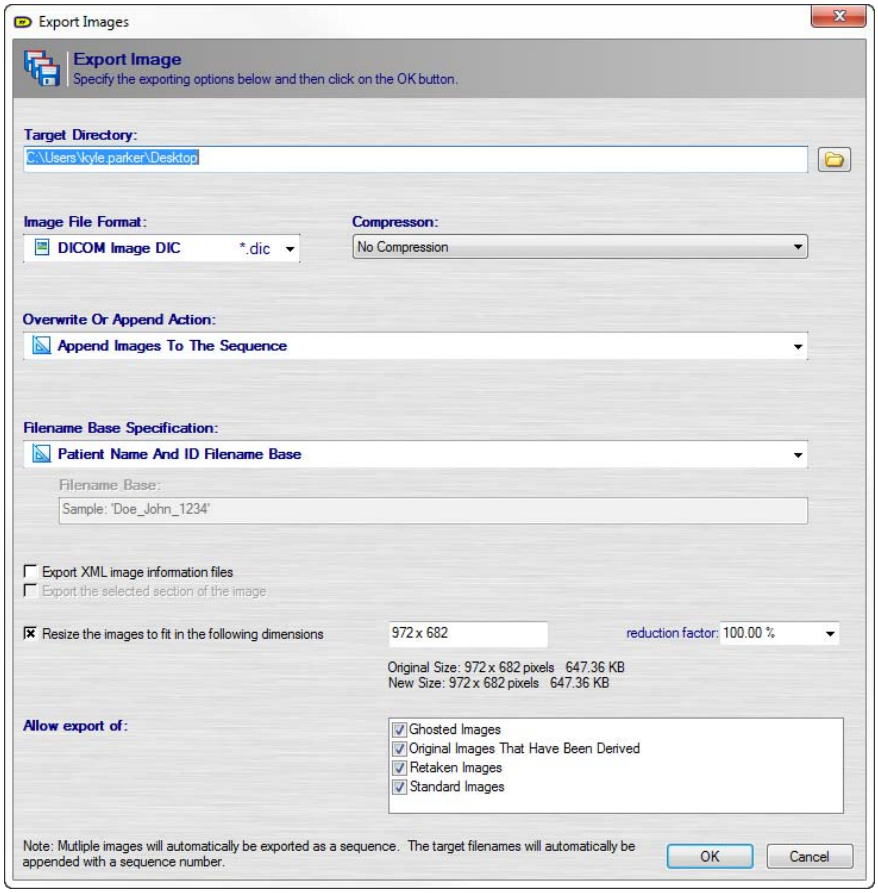


4. Using the Layout Format dropdown, select the desired template for export.
5. Left-click and drag images into their respective tiles.



6. When finished, click **Save**.

7. The Export Images interface appears. Users can specify the target directory, file type, as well as file name.

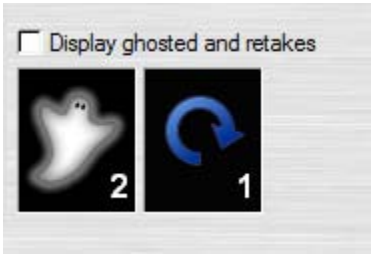


Note: Users can choose to ignore Ghosted, Retaken, and Derived images during export using the 'Allow Export Of' section.

8. Click **OK** to export the combined single image.

Ghost/Retake Bins

The deletion of images is disabled by default to protect data integrity and prevent data loss. The ghost and retake bins allow images to be 'hidden' from the image collection screen, simulating the image being deleted.



- **Ghost Bin:** The ghost bin is used for images that are non-essential. Progress shots during an Endo procedure are an example of images contained in the Ghost Bin.

- **Retake Bin:** Retaken images are used for images that have been retaken as a result of a defect, such as a cone cut.

Adding/Removing Images to the Ghost and Retake Bins

1. Select the image that will be added to the Ghost or Retake bin
2. Left-click and drag the image down onto the desired bin icon

   If an image has already been added to the ghost or retake bin, dragging it back onto the respective bin will remove the ghost or retake classification and un-hide the image.

3. Verify that the image has been added to the bin by checking the 'Display ghosted and retakes' checkbox.

   When an image has been added to the ghost or retake bin, the respective text will appear in the image information below the thumbnail image.

Image Information Tabs

When a single image thumbnail has been selected, a series of tabs will appear along the lower portion of the application.

These tabs are a condensed version of the DICOM Tags screen, containing the essential DICOM tag information: Patient, Study, Series, and Image information such as Name, Date of Birth, ID number, taken date, etc.. Additionally, there is a miscellaneous tab that includes image file information, including the file type, operator user, and workstation that the image was captured on.

Clicking on the blue tabs will cycle through each set of information.

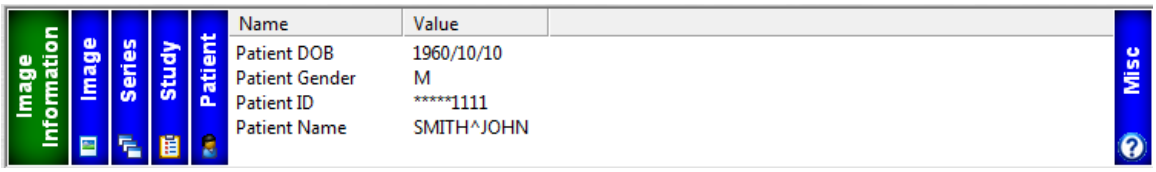
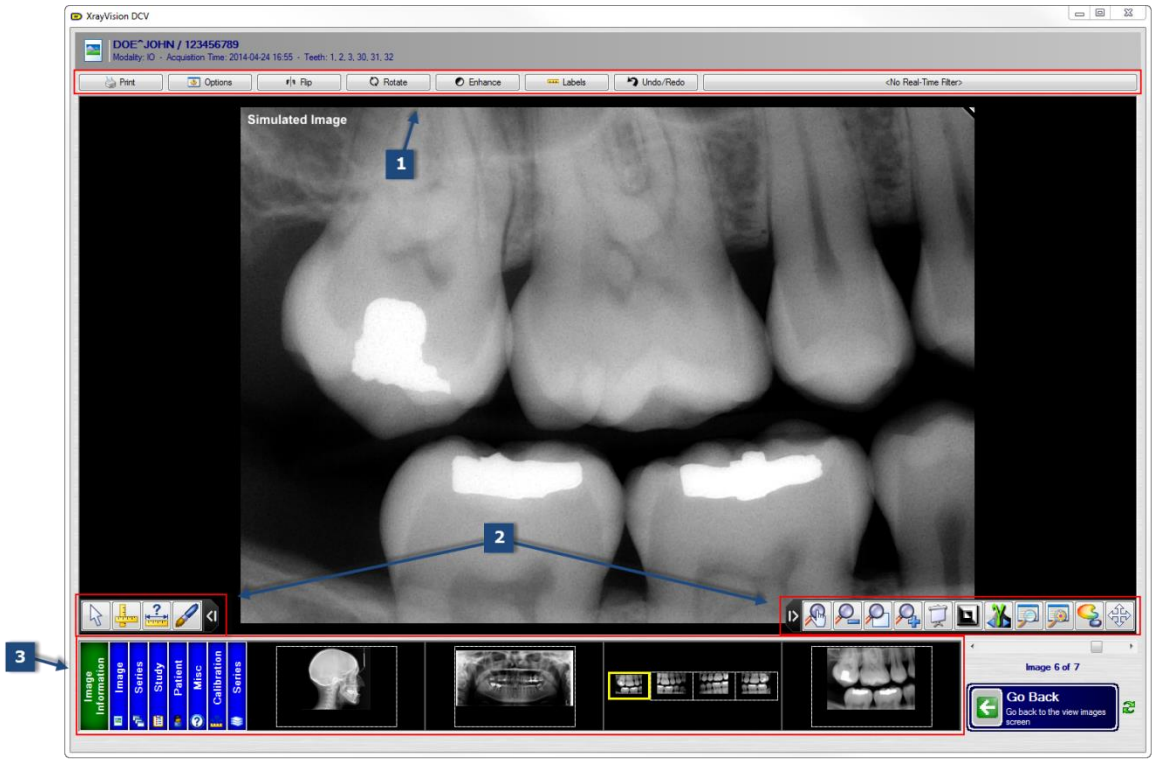


IMAGE ENHANCEMENT

Interface



The Image Enhancement interface allows for the modification, enhancement, and manipulation of a single image. To protect data integrity, the deletion of images is prohibited by default in XrayVision DCV. Many of the tools found in the Image Enhancement interface are working tools only, and their changes are not saved to the image.

Because enhancements and modifications, known as Labels in DCV, are not saved to an image, there are several options contained in the toolbox drop-down menus whose names are followed by '**with Labels'**. This denotation indicates that the image can be printed, copied to clipboard, or saved outside the application with the enhancements and labels placed on an image, for reference purposes.

The Image Enhancement interface contains three main sections:

1. **Toolbox:** The toolbox is situated along the top of the Image Enhancement interface, and contains several drop-down menus, including:
    - **Print:** The print dropdown contains two options: Print and Print with Labels. These options allow the user to send the image currently being viewed to a Windows recognized printer (if present), with or without labels. For additional information and workflow steps to print images, see Print Images.
    - **Options:** The options menu contains information and file based tools that allow a user to copy an image to clipboard, save/export images, edit image information, view DICOM tags, as well as burn images. Additional information regarding the tools found in the options menu can be found in Options.
    - **Flip:** The flip drop-down contains tools that allow the user to temporarily flip an image horizontally or vertically. These are working tools whose changes will not be saved unless the current user has the permission to do so.

- **Rotate:** The Rotate drop-down allows the user to rotate images 90 degrees clockwise, 90 degrees counterclockwise, 180 degrees clockwise, or a custom rotation specified by the user.
- **Enhance:** The enhance menu contains several enhancements that can be applied to an image to aid the diagnostic process. Additional information about the enhancements found in this menu can be found in Enhancements
- **Labels:** The labels menu contains several tools and graphics that can be applied to an image. Some of these tools and graphics include text, measurements, as well as implants. Additional information can be found under Labels
- **Undo/Redo:** Changes applied to an image can be undone or redone one by one using the Undo and Redo tools contained within this menu. Additionally, all changes can be removed at once, using the Original option.
- **Real-Time Filters:** Real-time filters are post-capture filters that can be left on so images are automatically displayed with the filter applied. Additional information can be found under Real-Time Filters

2. **Pop-out Toolbars:** The pop-out toolbars contain the most commonly used tools for modifying images. Information and descriptions of each of these tools can be found under Pop-out Toolbars.
3. **Image Information Tabs**: These tabs provide a condensed version of the DICOM Tags screen, containing the essential DICOM tag information: Patient, Study, Series, and Image information such as Name, Date of Birth, ID number, taken date, etc.

Options

Copying Images

Images can be copied with or without labels, directly out of XrayVision DCV using the Copy to Clipboard (with Labels) utility. Users can copy an image directly from XrayVision DCV to an email client like Microsoft Outlook, or into a Microsoft Word document so it can be sent to a patient or insurance provider, or for presentation purposes.

Images can be pasted by simultaneously pressing **Ctrl** and **V,** or by right clicking in the document that the image will be pasted into, and selecting ‘Paste’.

Save As/Export Images

Images can be exported and saved outside of XrayVision DCV using the Save / Export Image utility. Exporting images is commonly used when emailing images, or if the user would like to save labels and enhancements placed on an image outside of our application for reference.

Additionally, because images modifications cannot be saved within XrayVision DCV by default, users can use this tool to export an image with all modifications and labels to use for reference later.

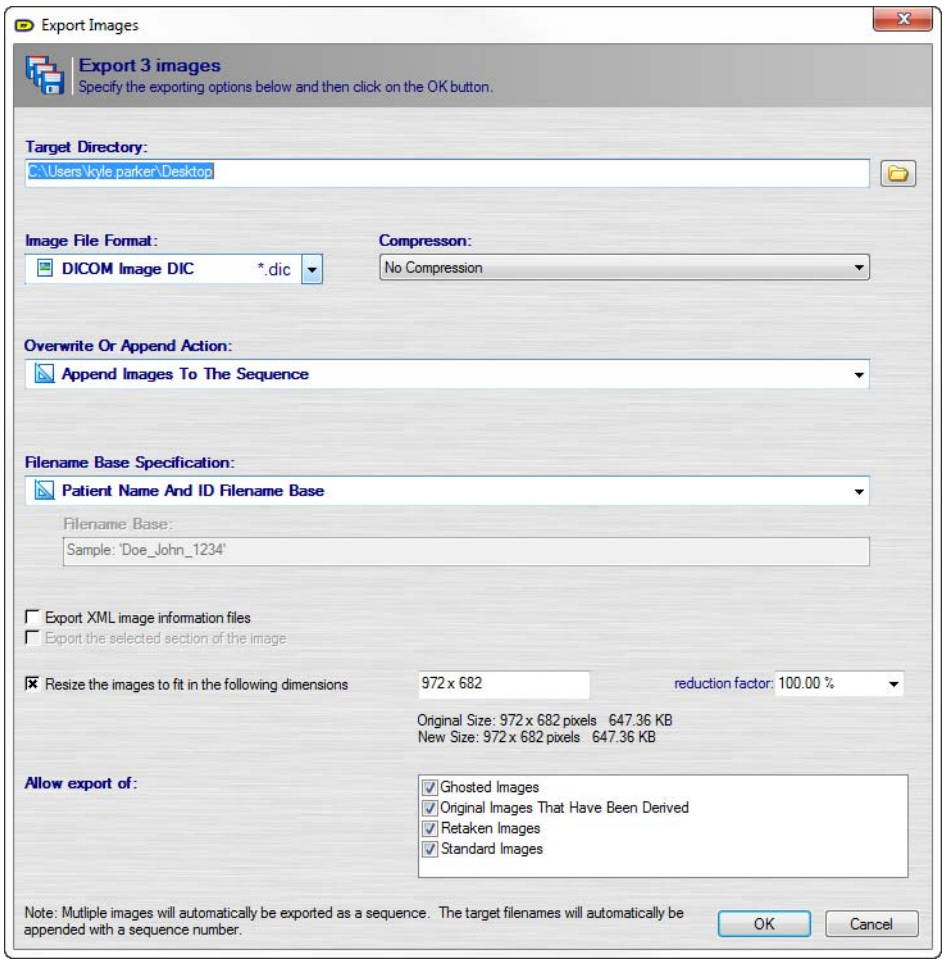
Several image file types can be selected within the Export Images interface: jpeg, tiff, bmp, and DICOM.

⚠ **Warning: DICOM files should never sent via unencrypted email! Each DICOM image file contains the associated patient’s first name, last name, date of birth, and social security / ID number. Given the insecure nature of email, only jpeg, bmp, and tiff should be used in favor of DICOM, as they do not contain any patient information.**

Because jpeg, bmp, and tiff do not contain DICOM information, there are several filename base specifications which can places non-sensitive patient information in the filename so it can be recognized outside XrayVision DCV.

Exporting Images

1. Highlight the image thumbnail(s) to be exported.
2. Click **Options**
3. Select **Save / Export Image**
4. From the Export Images interface, seen below, users can specify the target directory, file type, as well as file name.



Note: Users can choose to ignore Ghosted, Retaken, and Derived images during export using the 'Allow Export Of' section.

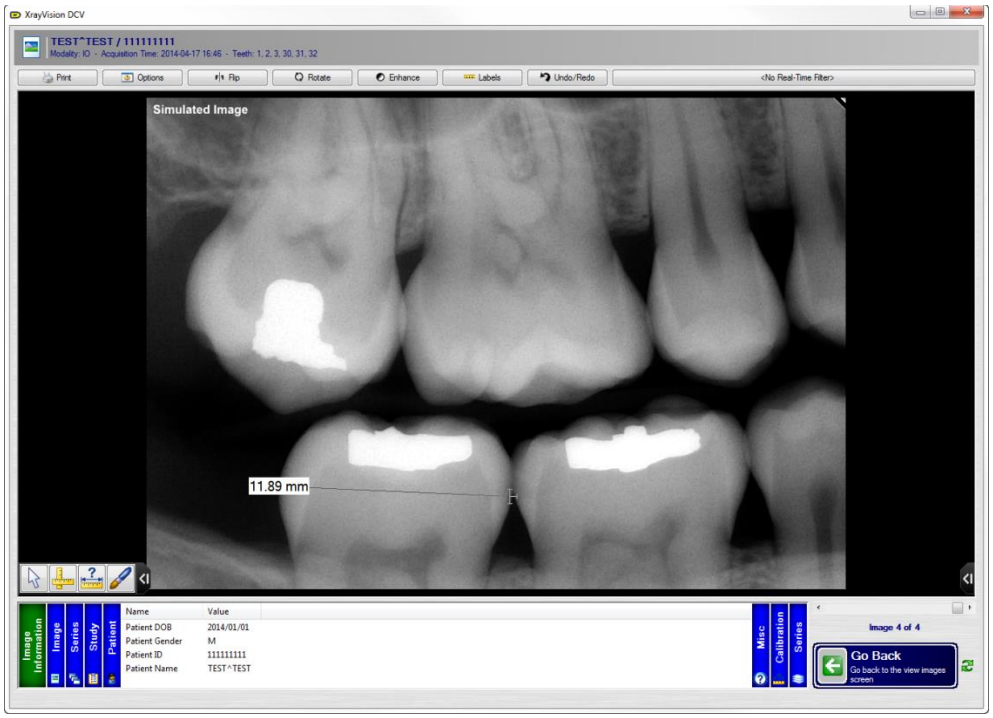
5. Click **OK** to export the selected image(s).

Save Images

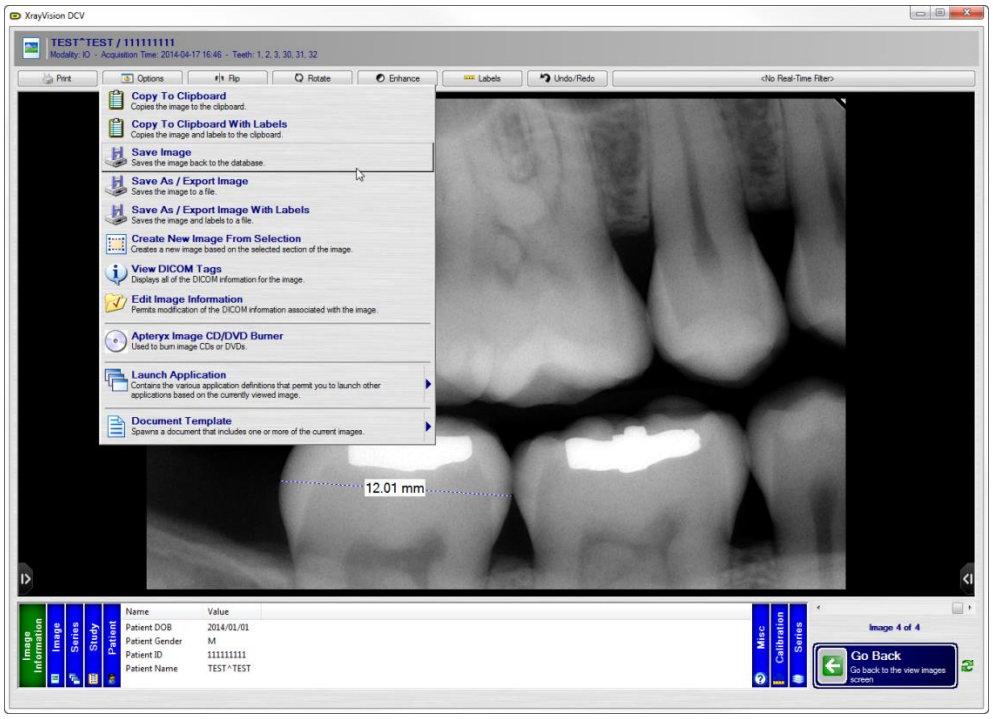
When enabled, the Save Image option allows users to manually modified images. If the user does not choose to save, all changes will be automatically discarded.

To save modified images:

1. Open a patient image.
2. Perform all desired modifications to the image.



3. Click **Options**.
4. Click **Save Image**.



5. All changes are saved.

When this option is disabled, users will be prompted to save or discard their changes before moving on to another image or clicking **Go Back**.

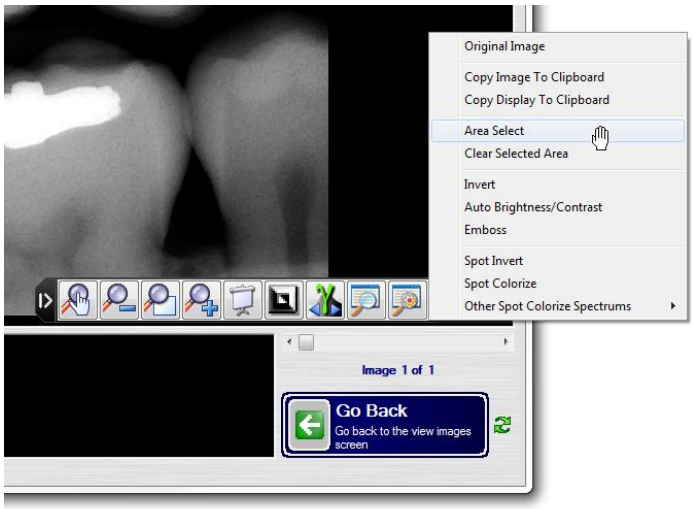
Create Images from Selection

This feature allows a new image to be created and saved in the database, containing any labels and modifications performed on an image.

To create a new image from selection:

1. Expand the right-hand pop-out toolbar.
2. Select the Color Palette icon.

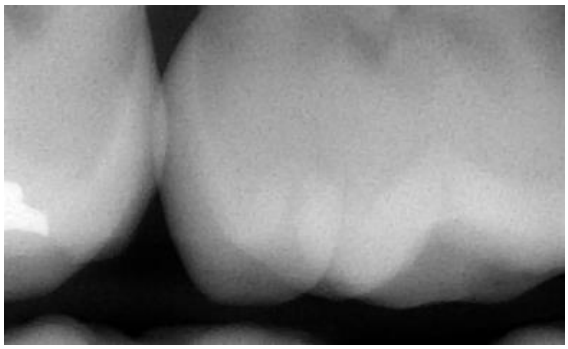
3. Select **Area Select**.



4. Click and drag the crosshairs to select the area to be used as the derived image.

5. Click **Options.**
6. Select **Create New Image From Selection.**

7. The derived image will appear as a new thumbnail, seen below.



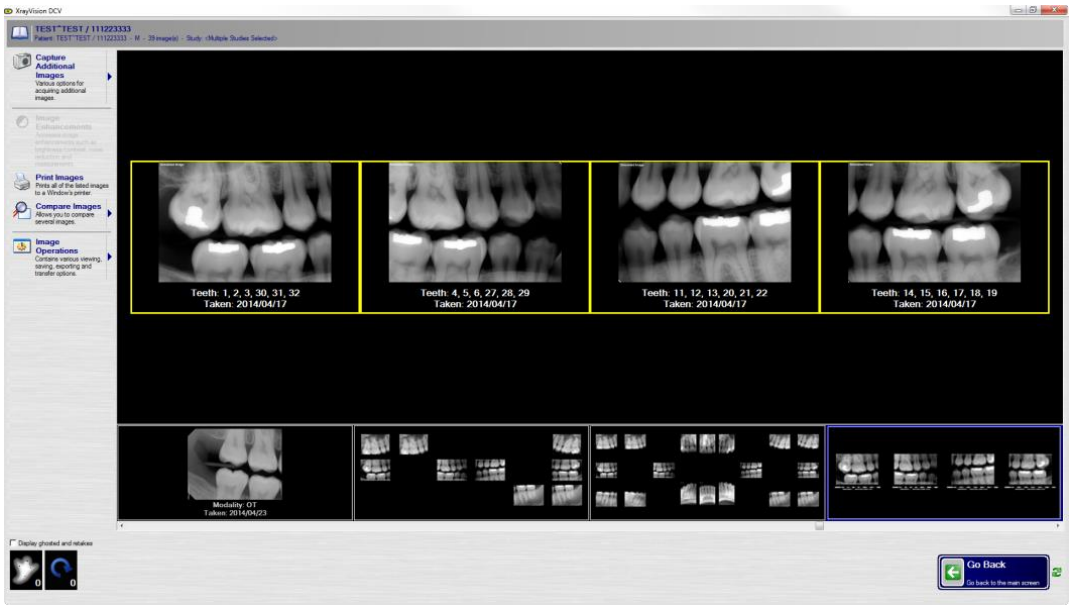
Document Templates

XrayVision DCV provides a library of document templates (e.g. referral letters, treatment plans, clinical reports, image cards, etc.) that a user can select to automatically spawn a document in Microsoft® Word. Each template is embedded with coding that inserts an open patient's image(s) and select patient information (Name, ID number, SS Number, etc.) into a new document.

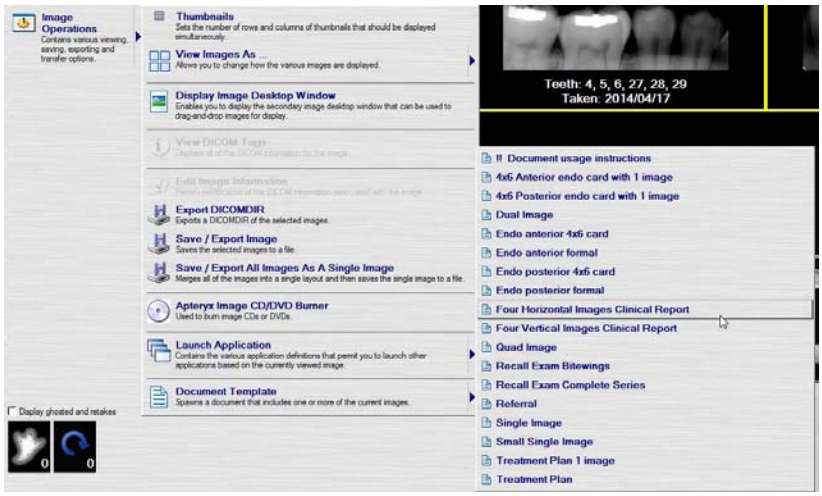
Macros must be enabled in MS Word in order to for the Visual Basic codes embedded within the document templates to be executed. Apteryx, Inc. recommends setting the macro security level to Medium. The medium security setting permits a user to allow or disallow macros when working with documents. Refer to Microsoft's help documentation for further instructions.

To spawn a document template:

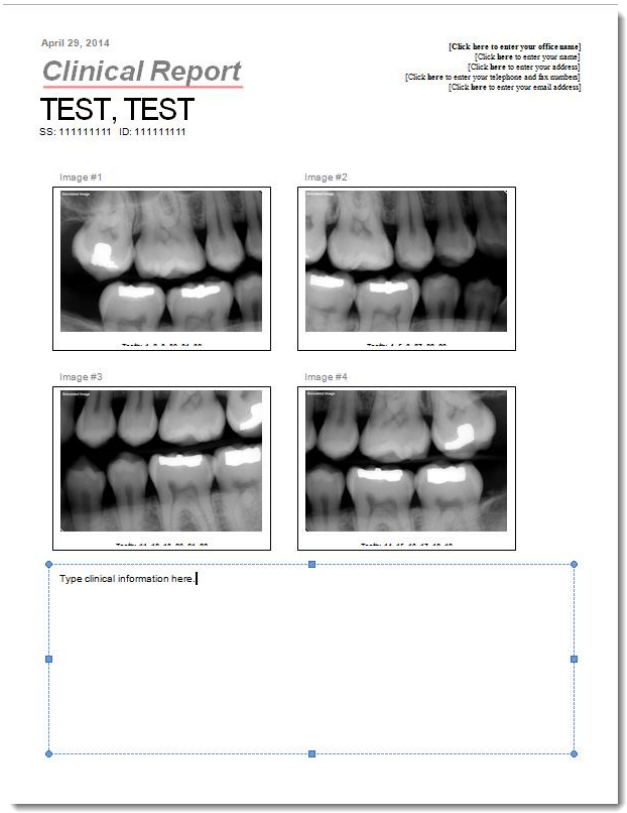
1. Click **View Images** from the home screen of DCV.
2. Enter search criteria. For additional information about search criteria, see the Query Interface section.
3. Click **Query For Images**.
4. From the search results, highlight the desired patient and click **View Patient**.
5. Click to highlight each image to be included in the document.



6. Click **Image Operations**.
7. Click **Document Template**.
8. Select the desired document template.



9. Microsoft Word will launch with the selected images populated in the template.



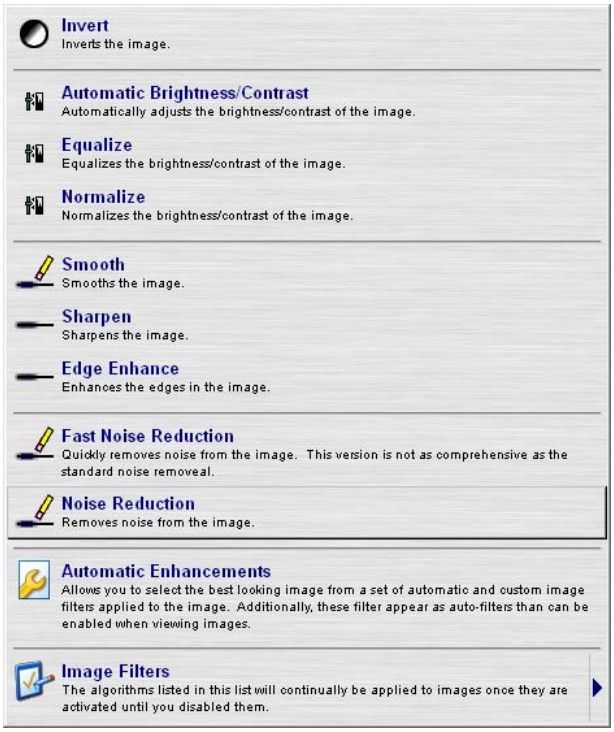
10. Enter any additional information required in the provided field.
11. Save the document to the location of your choosing.

Document templates are customizable, allowing for practice information, logos, and additional information to be added. For additional information about customizing document templates, please refer to the XrayVision DCV Preferences user manual.

Enhancements

Enhancements are filters that can be applied to an image with a single click. These filters can be applied multiple times, providing an increased degree of enhancement.

1. **Equalize –** The equalize tool enhances an image by redistributing contrast intensities across so the values are more equal. This provides a more evenly contrasted image, revealing bone density changes clearly.
2. **Normalize -** The normalize tool enhances an image by stretching the lightest shade of grey to white, and the darkest shade of grey to black, and distributes every shade between them appropriately across the grey scale. This tool reveals data that may not be visible as a result of under or overexposure, for example.
3. **Image Filters:** The image filters menu contains the same tools as the Real-Time Filters tab.
4. **Noise Reduction:** There are two types of noise reduction tools available; Fast Noise Reduction and Noise Reduction. For normal intra-oral images, there is only a 3-4 second difference between full Noise Reduction and Fast Noise Reduction.



Labels

The labels dropdown menu contains a series of tools which can be placed on an image by selecting the tool and then clicking anywhere on the image.

1. **Measurement Tool**: If the image has been calibrated, the measurement tool allows for anatomies an image to be measured. For instructions on this tool, see Measuring an Image.
2. **Save Label Properties**: This option allows default settings to be saved for each label. The settings include: Color, font, size, fill color, etc.
3. **Calibration Options:** In XrayVision DCV, sensor images may be calibrated, allowing accurate measurements and implants to be placed on an image.
4. **Implants:** If an image has been calibrated, a true scale implant can be placed on the image. The implant option is located under the Advanced Labels tab. Additional information can be found under Implants.

Calibration Options

These measurements are based off a calibration factor, specific to the dimensions of an image returned. As a result, images returned from size 0,1, and 2 sensors can each be assigned a specific calibration factor, based off of the image dimension returned from that sensor.

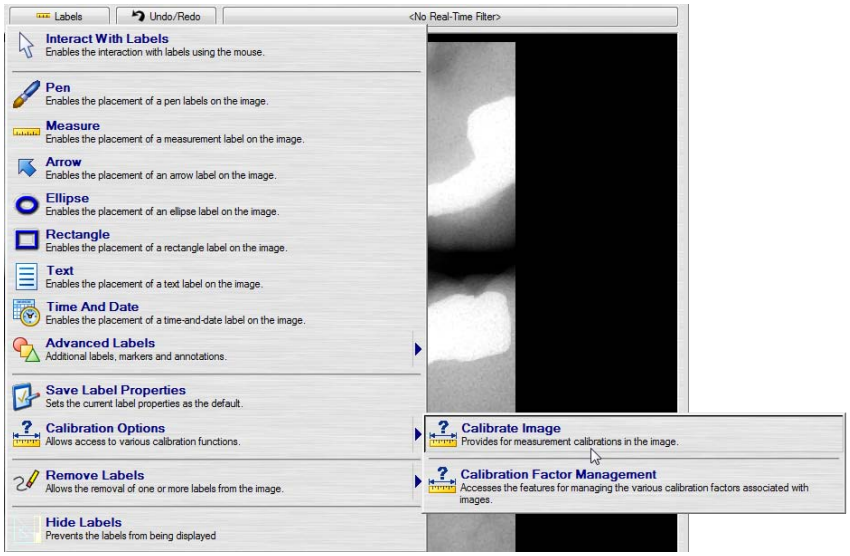
When calibrated, the information in the Calibration tab found in the Image Information Tabs will appear with a green background, indicating that the image has been calibrated and measurements can be performed. If the image has not yet been calibrated, the information will appear with a red background.

Calibrating an Image

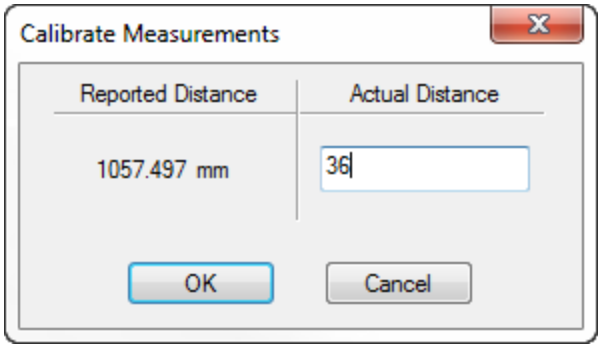
Before measurements or implants can be placed on an image, it first needs to be calibrated. This can be done in two ways; Based on the width of the window if the dimensions are known, or based on an object of known distance, such as a ball bearing.

To calibrate an image:

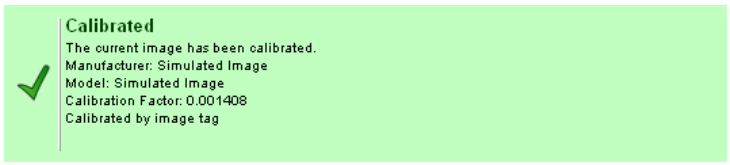
1. Click **Labels**
2. Click **Calibrate Options**
3. Click **Calibrate Image**



4. Click once and drag the crosshairs across the object of know distance or image dimension.
5. **Double-click** to finish the measurement.
6. Enter the distance in millimeters.



7. Click **OK** to save the calibration.
8. The Calibration tab in the Image Information tabs along the bottom will now appear green, seen below:

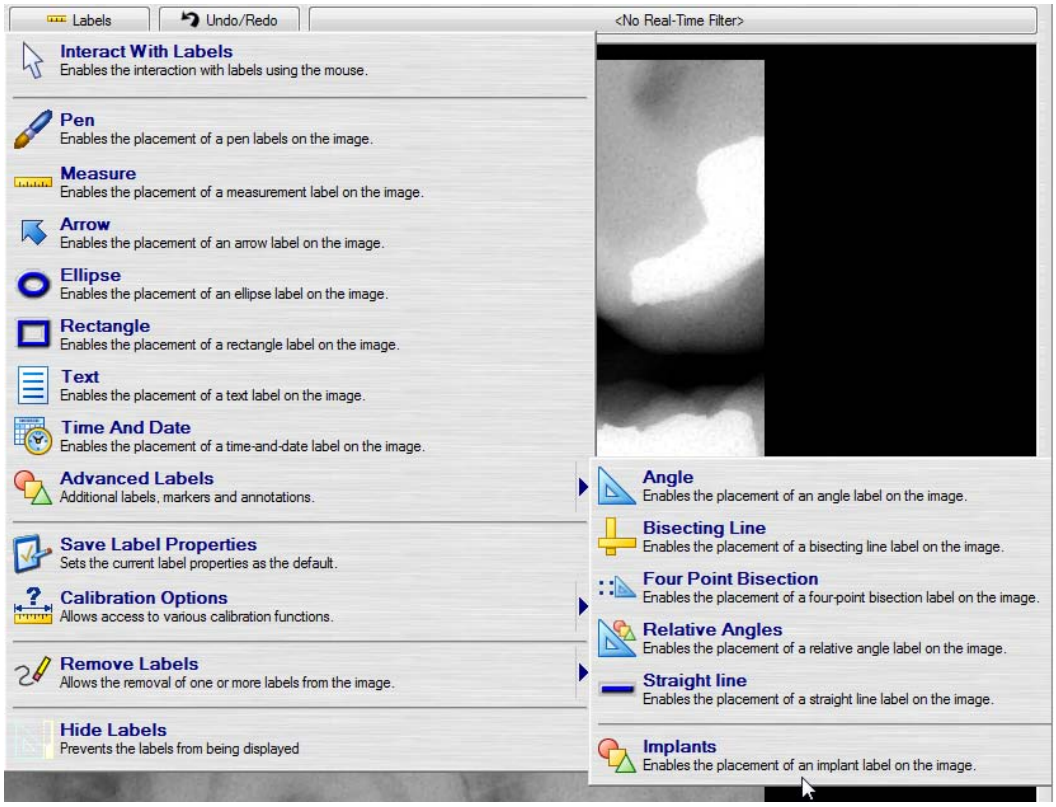


Implants

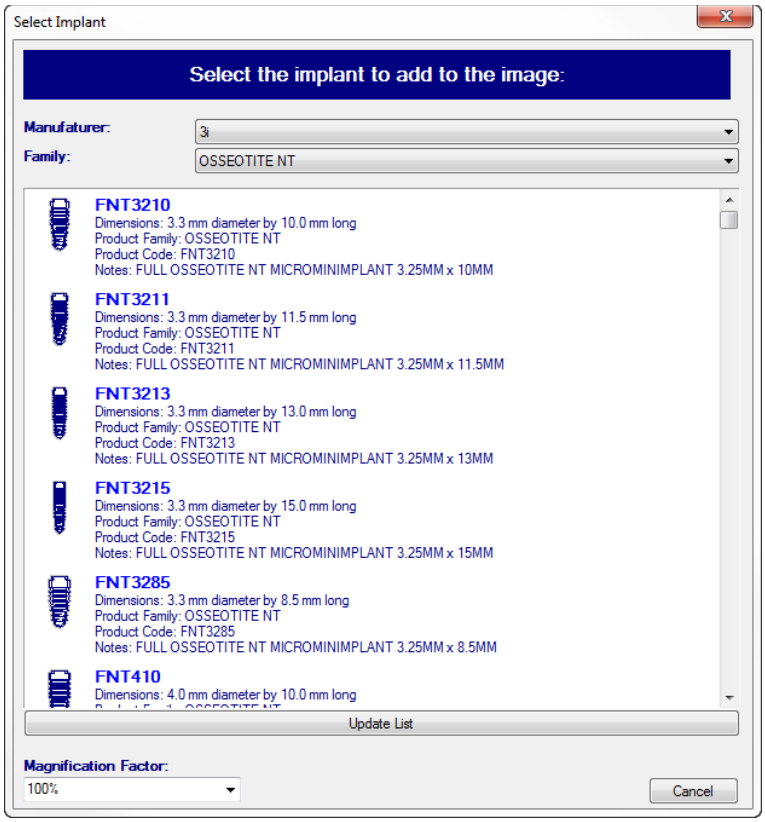
If an image has been calibrated, a true scale implant may be laid over an image. This implant may be moved, rotated, and placed to over a socket replicate a post-op image. We currently support the full implant families from 3i, Almitech, Blue Sky Bio, and Zimmer.

To add an implant:

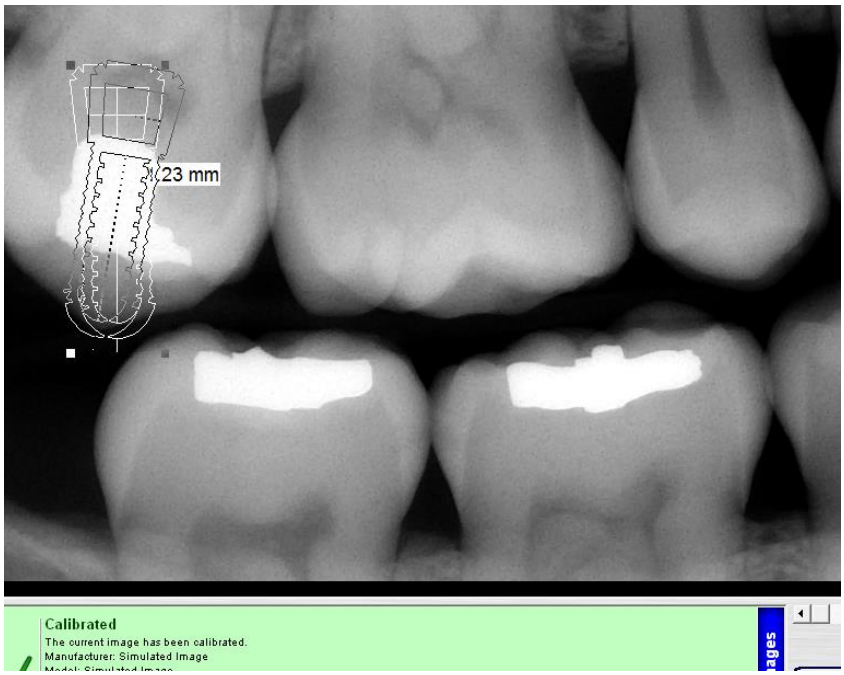
1. Click **Labels**
2. Click **Advanced Labels**
3. Click **Implants**



4. Using the crosshair cursor, click the screen to open the Implants interface.



5. Add your implant to the image by clicking on the graphic representation in the list.
6. Using the grey boxes, the implant can be rotated and moved around the image, as seen below:



Implant properties may be modified by double-clicking on the implant. These properties allow the color, fill color, and pen size to be modified.

Pop-out Toolbars

The Image Enhancement interface contains two pop-out toolbars, contained in the lower right and left-hand corners of the image viewing area. These toolbars can be expanded by single-clicking to reveal the following two toolbars:

Left Toolbar:

1.  **Pointer Tool**: The pointer tool will remove any currently selected tool from the cursor.
2.  **Measurement Tool**: If the image has been calibrated, the measurement tool allows for anatomies an image to be measured. For instructions on this tool, see Measuring an Image.
3.  **One-time Calibration**: A one-time calibration can be applied to an image if an object of known measure has been placed in the image, such as a ball bearing or endo file, allowing the image to be calibrated off of the object. This calibration will be applied only to the current image only, This one-time calibration is performed just like the **CALIBRATE IMAGE** function.
4.  **Pen Tool**: The pen tool allows the user to draw on the image. To remove this tool from the cursor, simply click the Pointer Tool.

Right Toolbar:

1.  **Spot Zoom**: The Spot Zoom tool allows users to zoom in or out from a point using the right and left click buttons on the mouse. This tool will zoom in on wherever the cursor is hovering above, allowing for specific points to be selected and zoomed in on.
2.  **Static Zoom:** The Static Zoom tools will zoom in or out of an image with each click on the button.
3.  **Fit Screen:** The Fit Screen returns an image back to the window dimensions, allowing the full image to be viewed.
4.  **Presentation Mode:** Presentation Mode allows an image to be viewed full-screen. This mode also removes all colors from the screen, allowing the image to be viewed in true black and white.
5.  **Brightness/Contrast:** Brightness and contrast are combined into a single tool, allowing them to be simultaneously adjusted. Brightness is adjusted by clicking and dragging upwards or downwards on the image. Similarly, contrast can be adjusted by clicking and dragging left or right on the image. These tools have been combined so that they can be used to complement each other.
6.  **Gamma:** Gamma adjustment uses the same adjustment methodology as Brightness/Contrast tool seen above. Clicking and dragging the mouse horizontally along the image will increase or decrease the Gamma adjustment.

Gamma performs a similar function to Brightness/Contrast in that it will lighten or darken an image. Gamma adjustment differs in that it is dynamic, where Brightness/Contrast is static. Gamma maintains all of the relational information between different hues in the image, so that information is never lost, regardless of the extremity of the adjustment.

7.  **Magnifying Glass:** The magnifying glass can be used to magnify a specified area on the displayed image. The settings for this glass can be adjusted by double-clicking on the image. These settings allow the glass size and the degree of magnification to be adjusted, which ranges from 2X to 5X zoom.

8.  **Spot Enhance:** The Spot Enhance tool places the normalize tool in a glass, which can be dragged around an image. The size of the glass can be changed by double-clicking on the image.

9.  **Screen Scroll:** The Screen Scroll tool allows users to click and drag the image while zoomed in, allowing other portions of the image to be viewed.

Measuring an Image

The measurement tool can be accessed from the left-hand pop-out toolbar, or from the Labels dropdown menu.

1. Click the **Measure** icon in the pop-out toolbar, or in the Labels menu.
2. Left-click once to place the initial anchor point and begin measurement
3. Double-clicking will end the measurement, which displays the distance in millimeters.

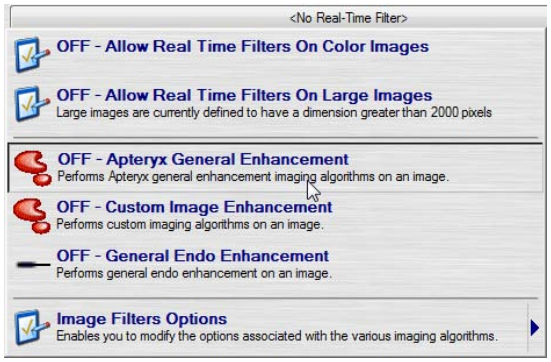
Single-clicking while measuring will place additional anchor points on the image. This feature allows curvature, such as a canal, to be measured accurately. After double-clicking to complete the measurement, incremental measurements will appear for each segment between anchor points.

Real-Time Filters

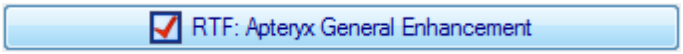
Real-time filters are post-capture filters that can be left on so images are automatically displayed with the filter applied. By default, the Apteryx Real-Time Filters will be available. Depending on the imaging hardware in use at your clinic, hardware-specific real-time filters may also be available.

Applying a Real-Time Filter

1. Click the **Real-Time Filter** tab.
2. Select a real-time filter.



3. When a real-time filter is applied, the tab will appear blue.

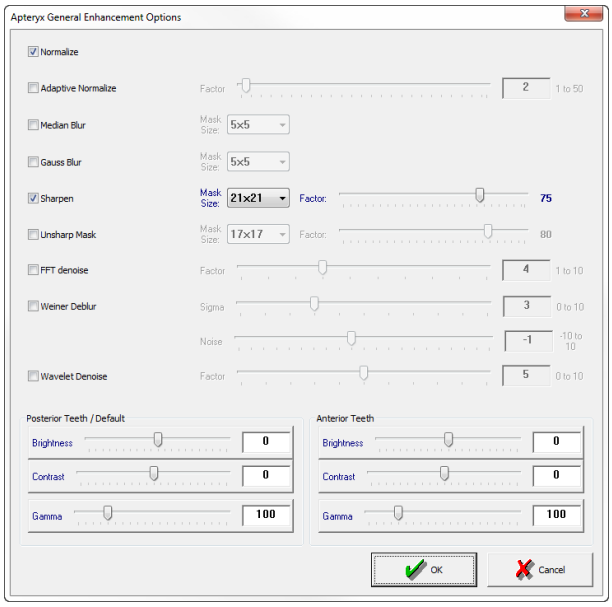


The same process is used to remove a Real-Time Filter; Expanding the Real-Time Filter tab and clicking on the green highlighted filter will remove the filtering from the image.

Modify Image Filter Options

Some Real-Time filters are customizable, allowing different combinations to be applied at once. To modify these filters:

1. Click the **Real-Time Filter** tab.
2. Select **Image Filter Options**
3. Select the **Real-Time Filter** to be customized
4. The options interface will appear, allowing any customizations to be made.



5. After all changes have been made, click **OK**

ADVANCED USER TOOLS

Located in the lower left-hand corner of the XrayVision DCV home screen, the Advanced User Tools menu contains a collection of tools and utilities which can be customized by the user. By default, the following options are displayed:

1. **Import Images:** Import Images allows DICOM images to be added to the XrayVision DCV database. Any amount of DICOM image files may be added simultaneously.
2. **Data Correction:** The Data Correction tool is the only point in the software where image information for multiple images may be edited simultaneously. For instructions and information regarding Data Correction, see Appendix 1 – Data Correction.
3. **Report Generator**: This tool allows a report to be customized and generated, which outlines the DICOM information of a given database. For instructions and information regarding the Report Generator, see Appendix 2 – Report Generator.
4. **Manage Auto-Match List**: This tool allows users to manage the auto-match dropdown list that appears when users enter patient information in the Capture and Query interfaces. Users may delete specific entries, as well as purge old entries by age.
5. **Manage MRU Patient List**: This tool allows users to manage entries in the MRU patient list, found in the Capture and Query interfaces.
6. **Display Monitor Test Pattern:** This utility helps users to properly adjust the brightness/contrast settings for their display.
7. **Preferences:** Preferences contains all settings, options, and permissions for XrayVision DCV, and is password -protected.

Import Images

The Import Images tool allows DICOM images to be added to the DCV database in bulk. Common file formats, such as jpeg, bmp, and tiff, cannot be added to the DCV database using this tool.

To import common file format images, the Image Importer extension is needed, and is used just like normal image capture.

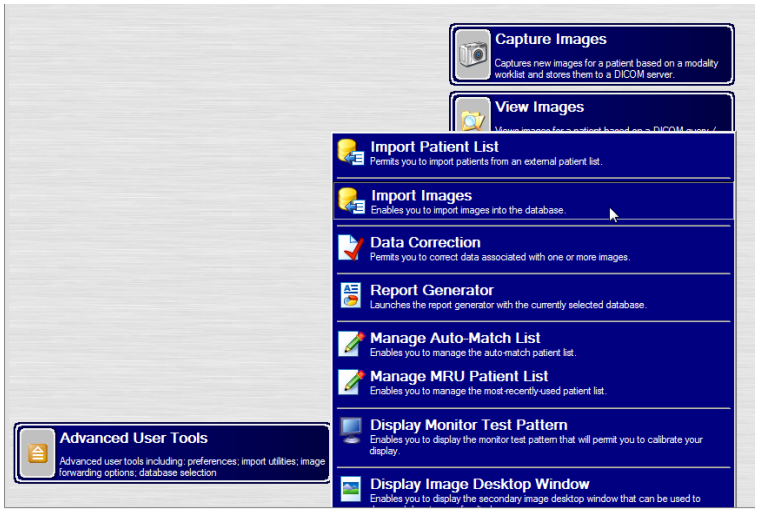
DICOM File Image Import

The Import Images tool, found in Advanced User Tools, is used to import DICOM images in bulk.

If the Import Images tool does not appear in Advanced User Tools, it must be enabled in Preferences. To enable this option, please contact your IT staff or Apteryx Technical Support.

Importing Images

1. Click **Advanced User Tools**
2. Click **Import Images**



3. Select the folder containing DICOM images to be imported.

4. Click OK.
5. The application will then report the number of images that were imported into the application. If no images are found, it will report that no images were imported.

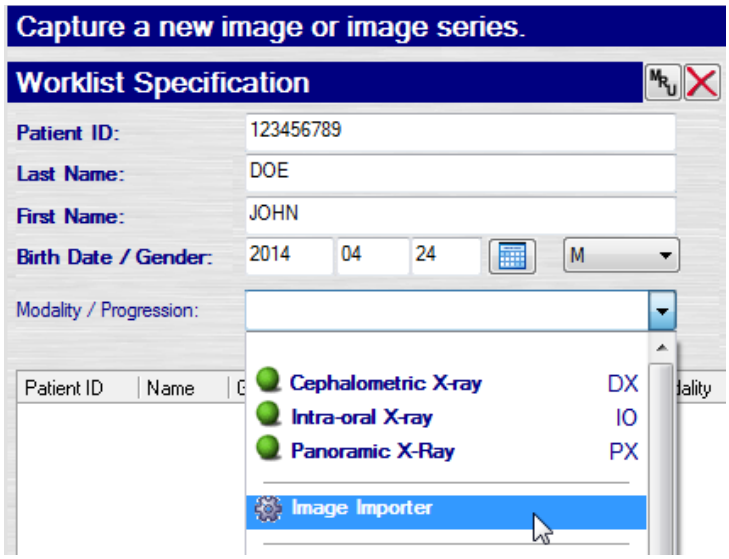
Common File Image Importer

Common file formats, such as Jpeg, TIFF, and BMP, can be added to the DCV database using the Image Importer extension.

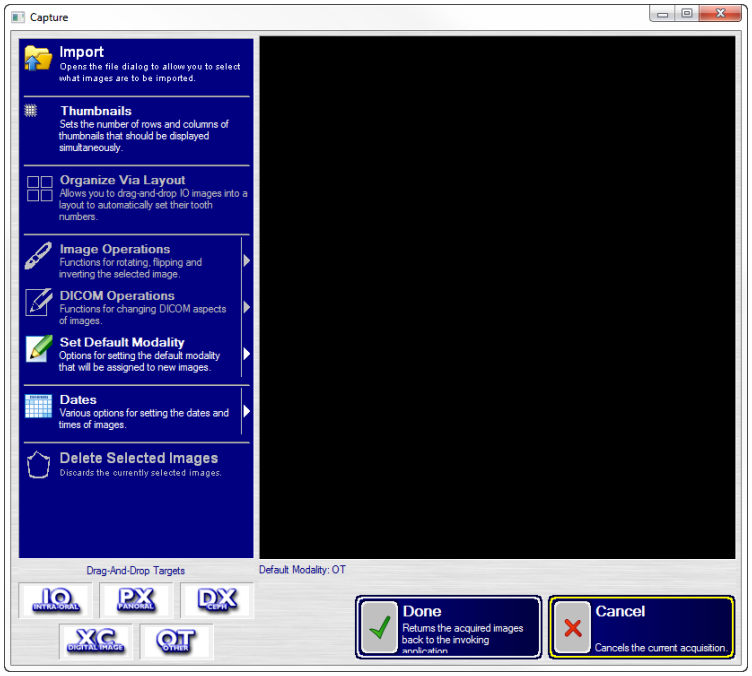
Importing Images

1. Select **Capture Images** on the home screen.
2. Enter all required patient information.
3. Under Modality/Progression, select Image Importer.

If the Import Images option is not present, the upgrader



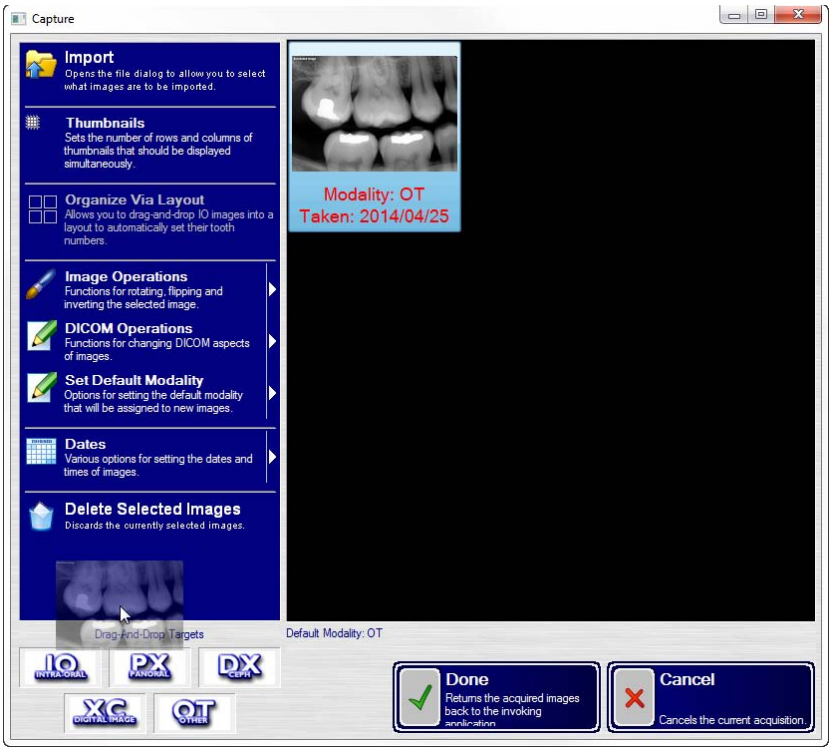
4. Click '**Capture Images**'
5. The Image Importer interface will appear:



6. Choose '**Import**'
7. A Windows Explorer window will appear, allowing images to be selected.

Multiple images can be imported simultaneously by holding the Shift key.

8. Drag each image to its appropriate Modality, using the Drag-and-Drop targets located in the lower left-hand corner of the Importer interface.



9. Click '**Done'** to import all selected images.

Data Correction

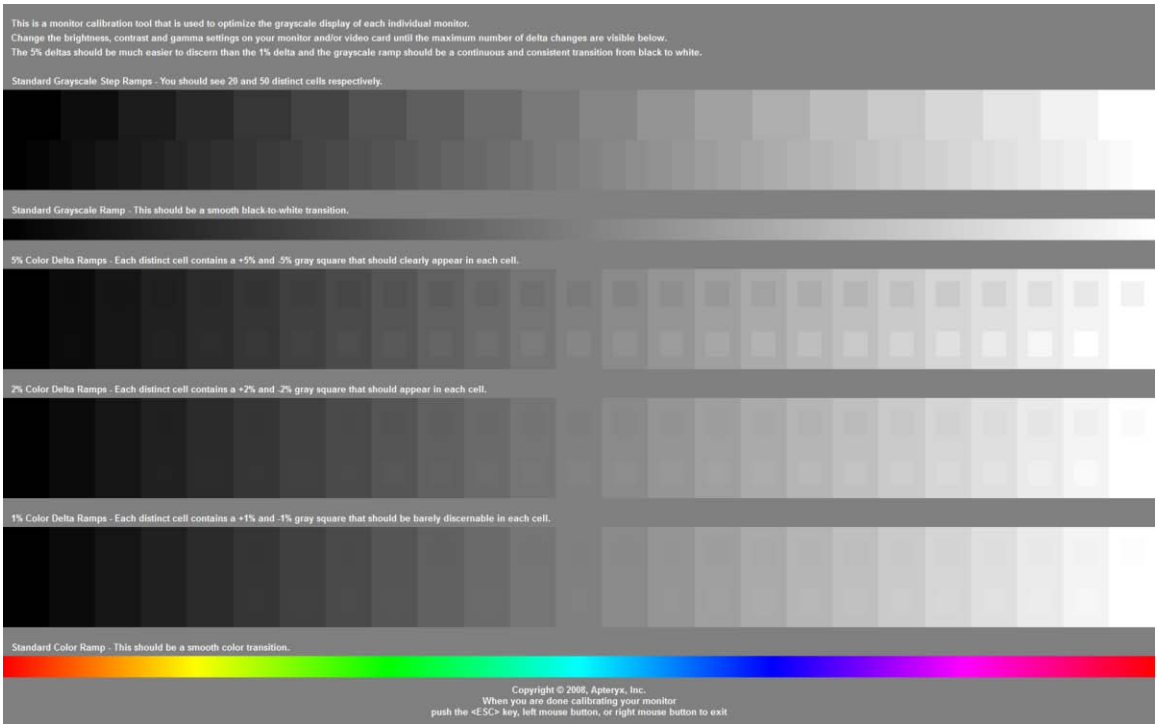
DCV Data Correction is a function that allows users to correct patient information associated with DICOM images. This tool is used if patient information has been entered incorrectly, causing the patient to be displayed incorrectly in DCV.

For additional information on Data Correction, please see Appendix 3 – Data Correction.

Display Monitor Test Pattern

Display Monitor Test Pattern is a tool used to properly adjust the brightness and contrast settings on a computer monitor. Clicking on this utility will display a series of segmented spectrums, from black to white, each of which should be visible if the brightness and contrast settings have been properly adjusted.

Each distinction should be visible, as seen below, if the monitor has been properly adjusted. If the shades are skewed to one side of the spectrum, making some of the cells indistinguishable, the brightness and contrast is then adjusted to compensate. Properly adjusted display settings provide an ideal environment in which to diagnose radiographs.



Preferences

Preferences is a password-protected area of XrayVision DCV which contains all settings, options, and permissions within XrayVision DCV. Please see your IT staff, or contact Apteryx for help.

APPENDIX 1 – DATA CORRECTION

Basic Functionality

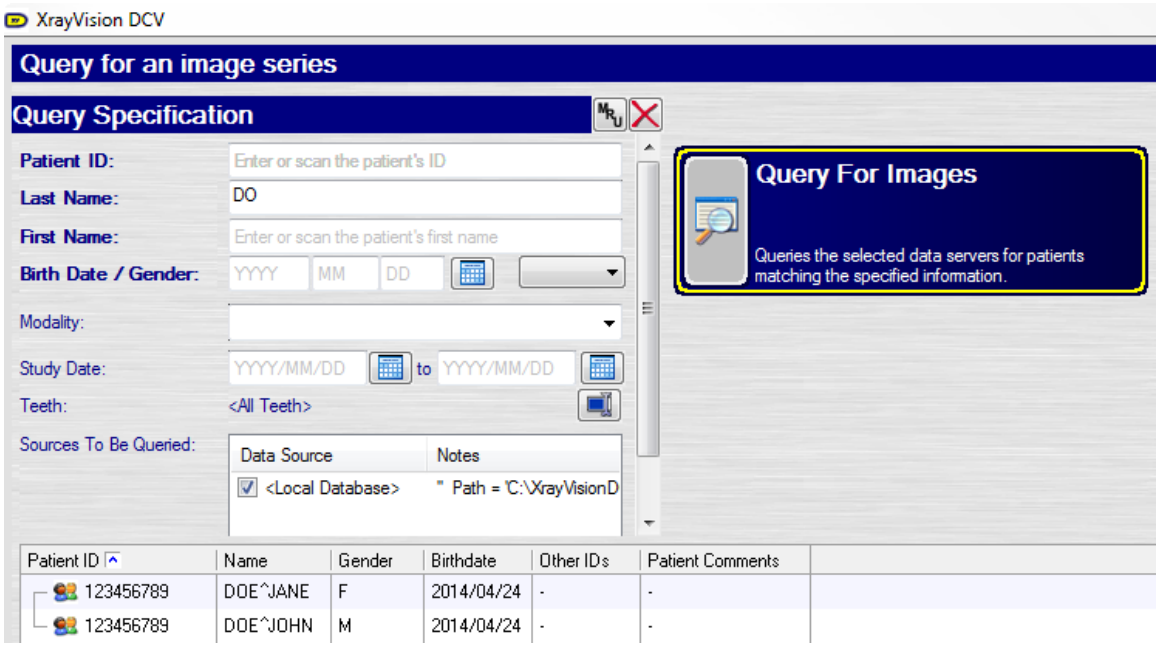
DCV Data Correction is a function that allows users to correct patient information associated with DICOM images. This tool is used if patient information has been entered incorrectly, causing the patient to be displayed incorrectly in DCV.

The more information that is entered in the search fields, the more accurate the search results will be, and the faster the search results will return. If little or no information is entered when searching, the search will take significantly longer and will return a much wider range of patients.

There are several places where the Data Correction feature is located in XrayVision DCV. This tool can be found under Advanced User Tools, in the Query Results screen, as well as in Permission and Data Correction tab of the Preferences. These differ from the data correction available through the Edit Patient Information option found when viewing an image because they allow for multiple images to be corrected at once, rather than on an image by image

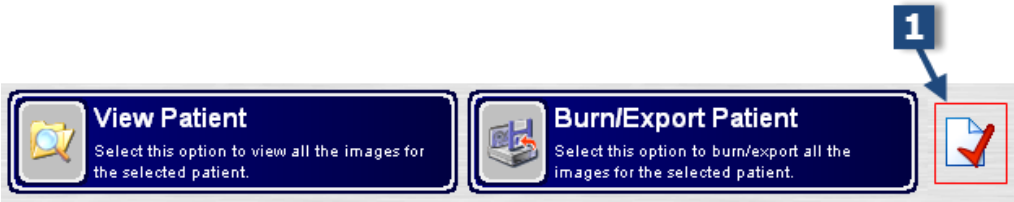
Query for Images

When performing a normal image search using the 'View Images' button on the home screen, wildcards are automatically applied to each search field. This is different from the Data Correction feature found in the Advanced User Tools, where you have to use an asterisk to apply a wildcard to a search field. A wildcard allows partial names or IDs to be used in the search fields, which retrieves all patients that match those characters. As seen below, if the letters Jo are entered in the first name field, the search will return every patient whose name starts with the letters 'Jo'.



A search based on a study date can also be performed, which finds all images captured over a specified date range. If images have been captured under the incorrect patient, this date range search can be used to locate and correct those images using the Data Correction icon seen below.

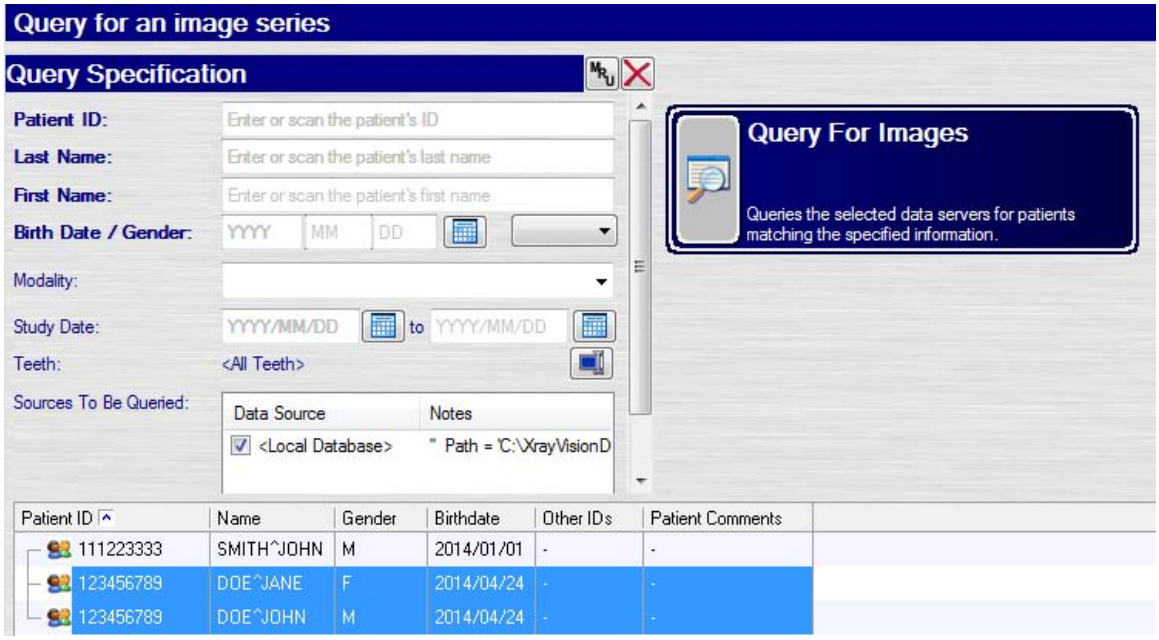
The Data Correction icon, located below the search results, allows patient information for the selected patients to be corrected directly from the search results. The Data Correction is found in the toolbox of the Image Query screen, seen in the image below.



Correcting Data in the Image Query Window

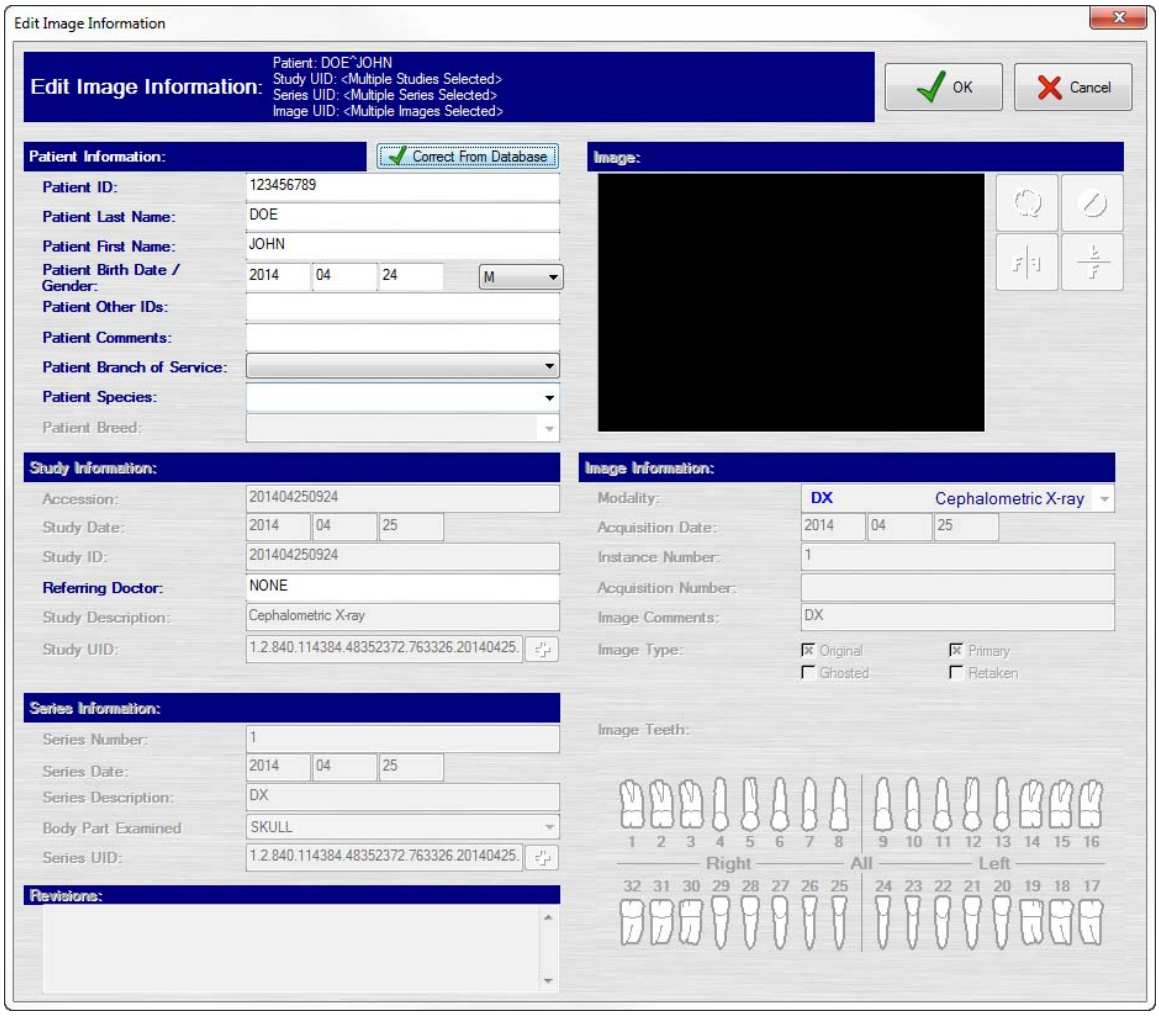
1. Open XrayVision DCV.
2. Click 'View Images'.

3. Perform an image query.
4. Highlight patient(s) that will be modified.



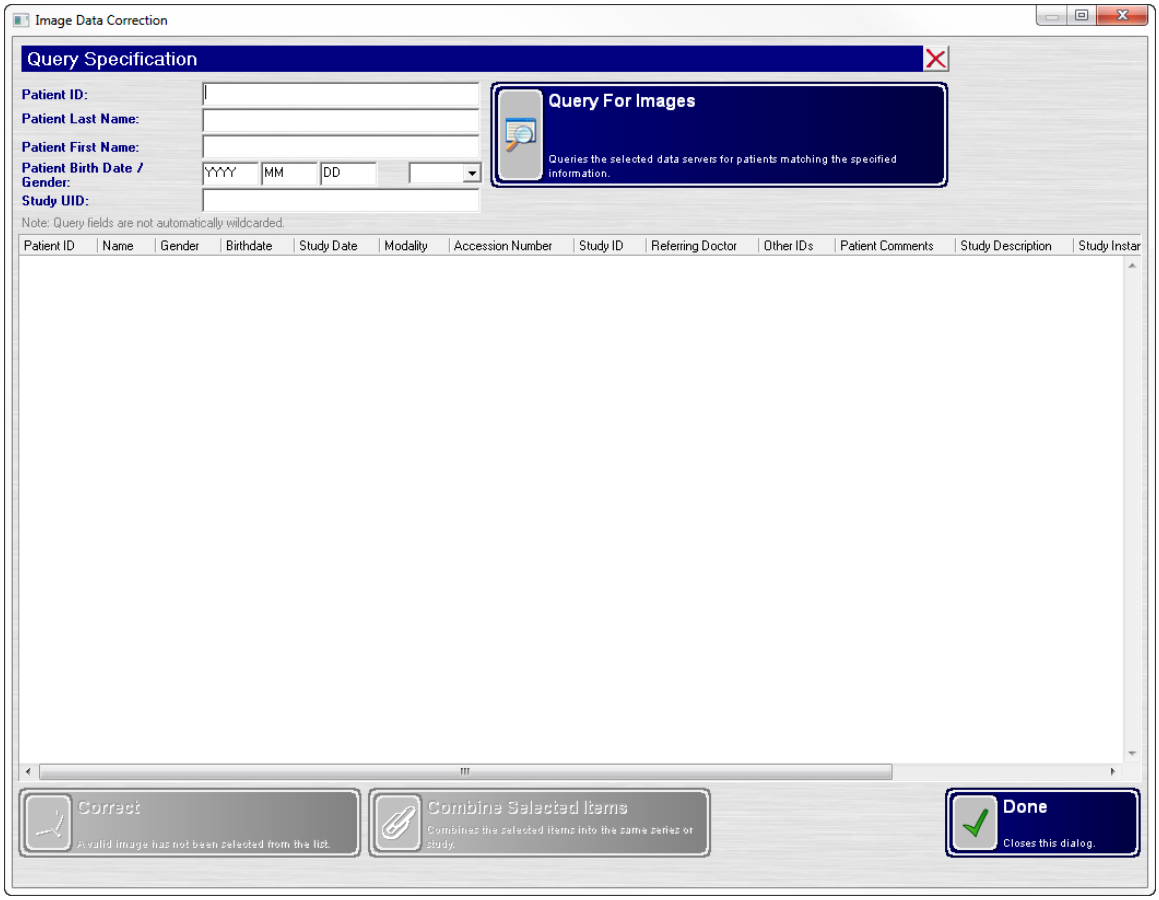
Multiple patients may be selected and modified simultaneously. If duplicate entries exist for a single patient, selecting multiple patients from the list allows users to merge multiple patient entries into a single entry.

5. Click the Data Correction icon.
6. The Edit Image Information window appears.



7. Make all necessary changes.
8. Click ‘OK’ to save your changes.

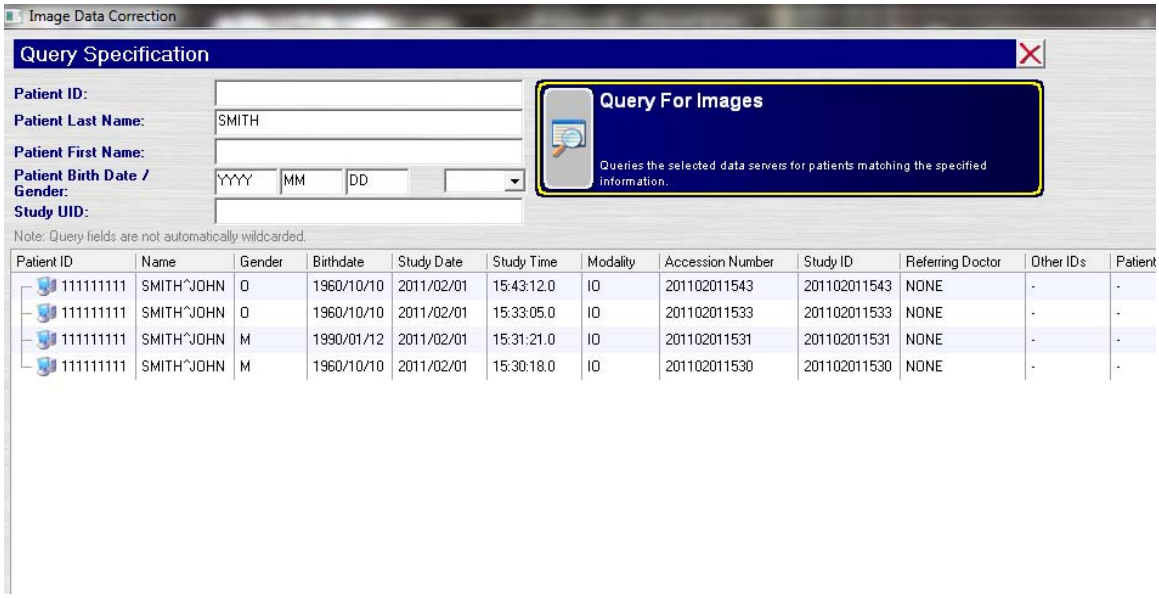
Data Correction



Data can also be corrected using the Data Correction utility found in Advanced User Tools and in Preferences. This utility operates like a normal image search in DCV; any combination of patient information can be used to search for images.

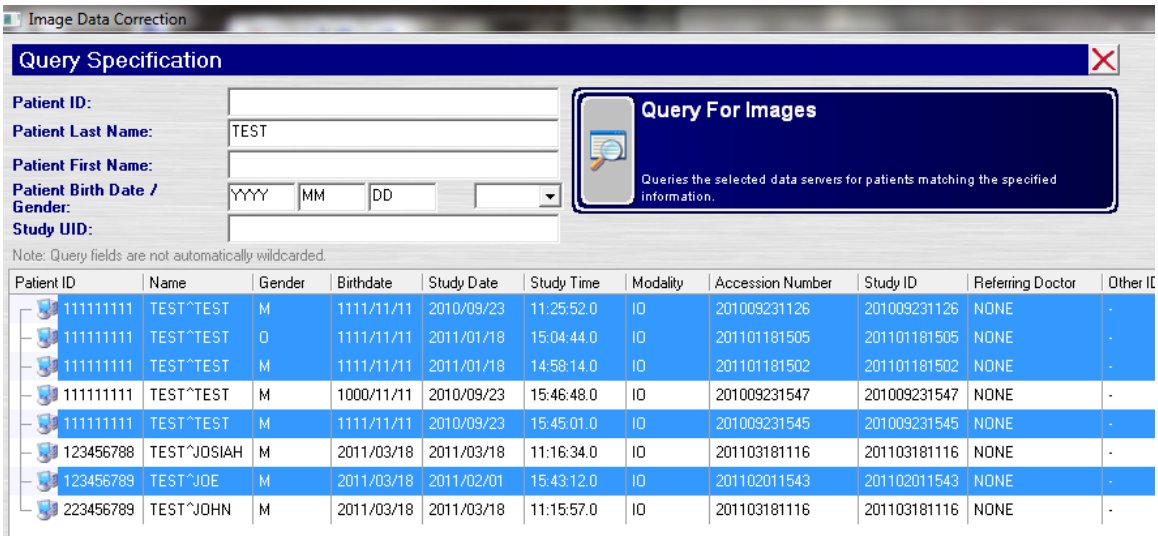
Correcting data using the Data Correction utility differs from a normal image search because wildcards are not automatically applied the search fields. To wildcard these search fields manually, an asterisk can be placed at the beginning or end of the patient's ID, or at the end of their first or last name.

Selecting Patient Studies



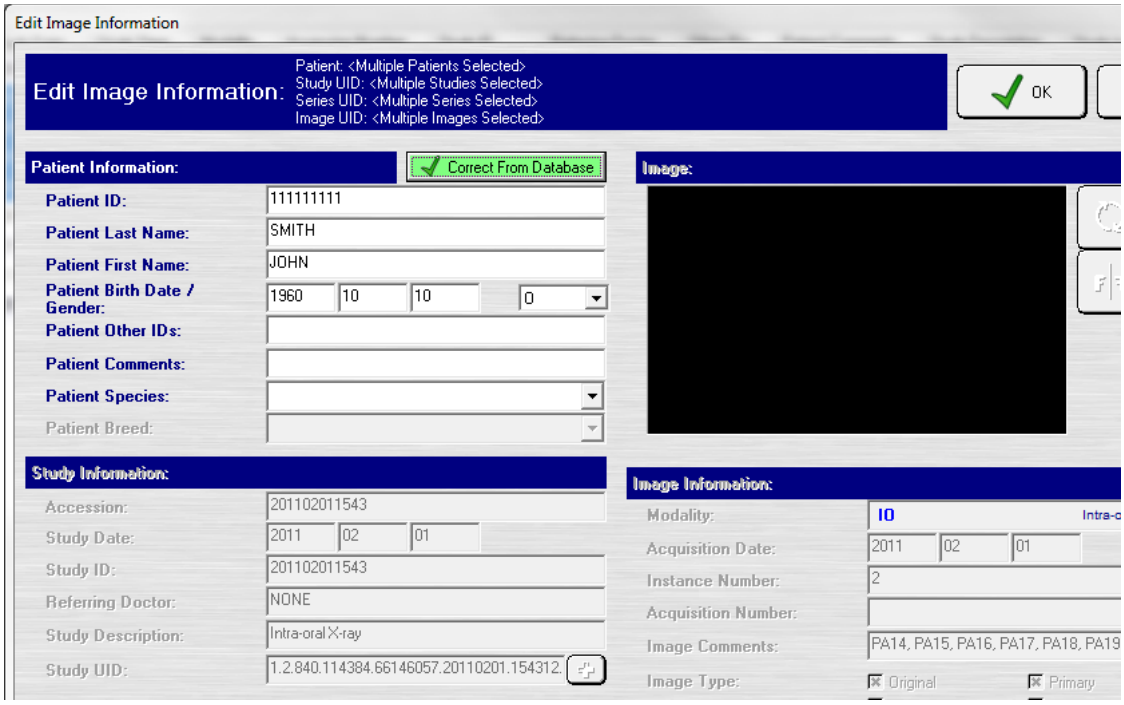
Search results are listed as studies, rather than entire patient files, because studies most commonly contain mistakes with patient information. Multiple studies can be selected by using the Shift or Control keys; Shift allows for the selection of a range of studies, while Control will allow users to select multiple studies individually. Individual images may also be selected for correction by double-clicking on a study to expand of the listed studies to reveal each series and image contained in the study.

The image below demonstrates both functions; the top three studies were selected using the shift key to highlight consecutive images. Individual studies, rather than consecutive studies, can be selected by holding the control key and clicking on each study.



Correcting Data

When the desired studies or images have been selected, click the ‘Correct’ button at the bottom of the screen, which will open the Edit Image Information screen, seen below.



When editing multiple patients and studies, the only information fields that will remain available are the patient-specific information; Image-specific information can be edited on a single image basis only as it is specific to a single image.

Patient information can be corrected in two ways; Manual entry of the correct information, or by using the green 'Correct From Database' button. This button will display a list of every patient in the database, and allow you to select the patient with the correct information to be assigned to the selected studies or images. Once the correct information has been entered or selected, simply click the 'OK' button to apply the changes.

After any change is made, the ID field will display '<Item Changed>', indicating that the changes have been applied.

APPENDIX 2 – REPORT GENERATOR

Interface

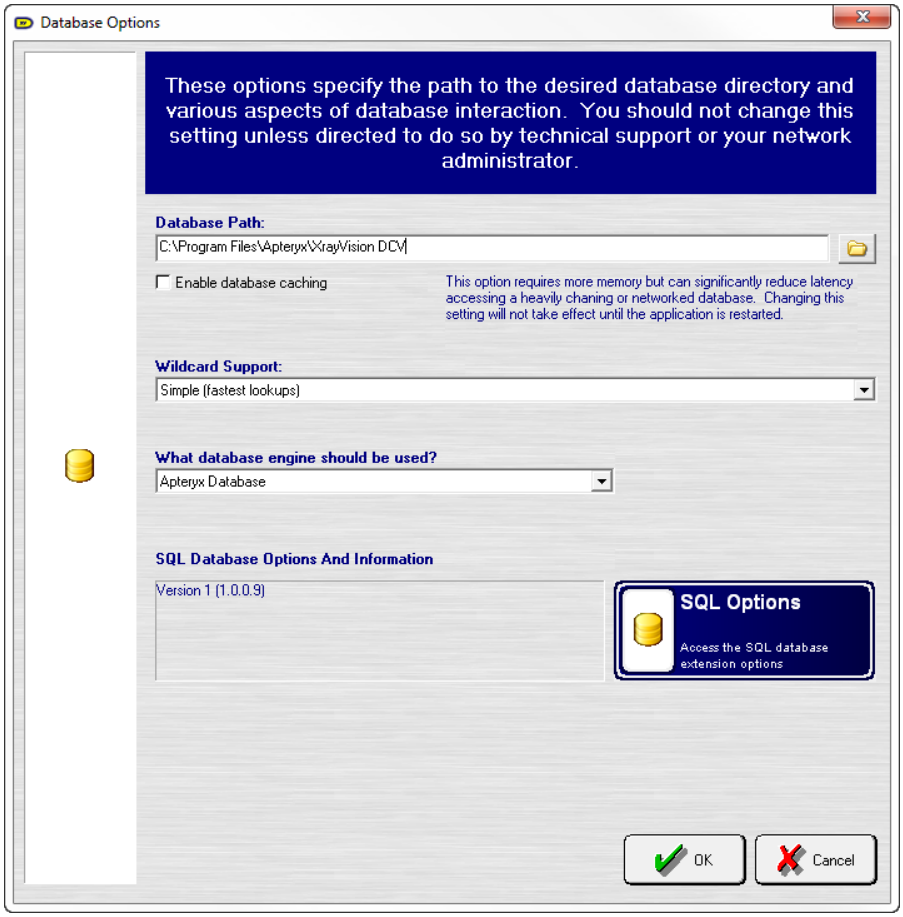
DCV Report Generator is a database utility designed for advanced users to compile a report based on the information contained within their database. This utility can be found by clicking on the 'Advanced User Tools' button on the home screen of XrayVision DCV. The information included in these reports is dictated by the criteria selected by the user, seen in the image below:

Data controls

Multiple Databases

In XrayVision DCV, it is possible to maintain two separate databases. If multiple database support is currently enabled, users may switch between databases using the 'Select Database' button, so that reports for each database may be separately generated. Although multiple databases can be

supported simultaneously within DCV, the Report Generator can only generate a report for one database at a time. After clicking 'Select Database', the following window will appear:



This path will be pre-populated with the Databases folder located in the director in which the DCV Report Generator executable is located. If your database is located in a remote location, this tool can be used to navigate to the correct database path.

Date Range

Reports can be generated about an entire database at once, or for a given date range, which can be selected under the Report Type section. By default, this option is set to 'All Records', which will create a report for the entire database. If a specific date range is required, this selection can be changed to 'Date Range', and the Date Range fields can be used to specify a time period.

Save and Print

The DCV Report Generator can handle reports in two ways; reports can be sent directly to a printer, or they can be saved as a text file. If there is a printer attached to your computer, it will appear in the dropdown list once the checkbox next to 'Printer' has been checked.

Reports may also be saved as a text file for review and storage. Once the 'File' option has been checked, a file destination path may be selected by using the folder icon to the right of the path field. After clicking on the folder icon, a 'Save As' screen will appear, allowing a location on the local computer or network to be selected for storage of the report. This feature is commonly used for documentation and record keeping purposes, where users would like to have a digital copy of each report that has been generated for a clinic or database.

Note: When 'Printer' has been selected, the user may choose to print a thumbnail sheet that can contain 3-7 images per sheet. This option is left deselected by default due to the paper requirement to print a thumbnail for every image contained in a large database.

Report Information

The DCV Report Generator allows users to customize the report to provide any combination of information in the report. An unlimited amount of options may be used simultaneously for a single report. Likewise, all of these options may be left blank, which will provide a very basic report that contains image counts for primary, ghosted, and retaken images, as well as a total image count. The number of criteria selected for the report will dictate the length of time required for the report to generate.

Image Information

There are several image-specific options that can be enabled to provide detailed information about the image. These options include: Modality, Doctor, Station, Location, Operator, and Sensor capture counts. Additionally, when using Modality count, Intraoral can be further broken down so that listings Bitewing and Periapical differentiated.

- **Modality:** The Modality Count option allows for the image counts to be further broken down by modality, such as Intraoral, Panoramic, Cephalometric, etc.
- **Doctor count:** Doctor Count provides the number of images captured for patients assigned to the Referring Doctor.
- **Station count**: Short for Workstation, Station Count records the name of the computer on which the image was captured.
- **Operator count:** Operator count reports the user that is logged into the computer at the time of capture.
- **Location count:** Location count reports the clinic or office where the image was captured.
- **Sensor capture:** Sensor capture provides a count of how many images, per piece of hardware, has been captured.

To limit the time required for a report to be generated, the **Fast Data Accumulation** option may be selected. Fast Data Accumulation excludes station, location, operator, and sensor capture counts from the report.

Patient Information

Patient specific criteria may be found in the bottom portion of the 'Data To Report' section. This information includes: Age, Sex, Patient Summary Count, Patient Itemized Count, Study, and Series counts. Each of these options is patient specific and is organized by ID number, except for Age and Sex counts, which cover all patients.

- **Age:** Patient age count option provides an entry for every age, and the amount of patients who are that age.
- **Sex:** Patient sex count provides a total count of all Male, Female, and Other patients.
- **Patient summary:** Patient summary count provides a listing of all patients, arranged by ID number, and the number of images associated with that patient.
- **Patient itemized:** Patient itemized count provides a listing of all patients, arranged by ID number, of all images associated with that patient, organized by modality.
- **Patient Study:** Patient study count provides a list of all patients, organized by ID number, and the types of studies captured for that patient.
- **Patient Series:** Patient series count provides a list of each patient, organized by ID number, and every type of series captured for that patient.

Study/Series Information

Unlike the patient-specific Study and Series counts previously mentioned, the Study and Series UID and Description counts are database specific, and are not organized by patient. These counts provide numerical values for the database as a whole.

- **Study UID image:** Study UID image count provides a listing of each study, organized numerically, and the number of images within that study.
- **Series UID image:** Series UID image count provides a listing of each series, organized numerically, and the number of images within that series.
- **Study description:** Study description count provides a count for each type of study captured in DCV. These are listed as any combination of modalities captured in a series, i.e.: Intra-Oral X-ray, Panoramic X-Ray.
- **Series description:** Series description count provides a count for each type of series captured in DCV. These include 4 Bite Wing Series, Panoramic Capture, etc.

Time Specifications

Database information can be organized by time period by Year, Year and Month, or Year, Month and Day. Image, Series, Study, Modality, and Keyword counts can all be arranged by these different time specifications. This information will be displayed as the following:

```
Total Images Yearly Report
-----------------------------------------------------------
2011:                    7

Total Series Yearly/Monthly Report
-----------------------------------------------------------
2011:                    4
April 2011:                4

Total Studies Yearly/Monthly/Daily Report
-----------------------------------------------------------
2011:                    3
April 2011:                3
```

20 April 2011: 1
21 April 2011: 2

In this report, the Images count is organized by Year, the Series count is displayed by Year/Month and the Study count is displayed by Year/Month/Day.

Database Information

In addition to Patient information reporting, the DCV Report Generator also has the ability to report on database specific information. These options include:

- **Image Revisions Report –** The Image Revision operation generates a report of all revisions performed in XrayVisionDCV. The report results are operator and operation specific, and is displayed as follows:

  General Information

  Database Path: C:\Program Files\Apteryx\XrayVisionDCV
  Total Image Count: 96
  Invalid Image File Count: 0
  Primary Image Count: 63
  Retake Image Count: 1
  Ghosted Image Count: 32

  Image Revisions Report

  0010:0040 - Patient Sex: 2
  kyle.parker: 2
  0020:000D - Study Instance UID: 2
  kyle.parker: 2
  OP(FlipH): 3
  kyle.parker: 3
  OP(Invert): 2
  kyle.parker: 2
  OP(Orient): 1
  kyle.parker: 1

- **Database Diagnostic Report** – The Database Diagnostic Report includes data integrity information about the database. This option will report on discrepancies of image counts in the database file compared to the number of DICOM images in the Images folder.

Generate Report

To generate a report based on your specified search criteria:

1. Click ‘Generate Reports’ button
2. A blue status bar will appear along the lower portion of the window, indicating the progress of the report.
3. Once it has finished, the report will be sent to the specified location on the computer and/or to the printer.

***** END OF DOCUMENT *****