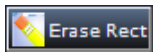# *De-identifying Studies with SHOWCASE®*

ShowCase provides you with tools to help de-identify DICOM images to use in teaching files and research studies. These tools can help you comply with the Privacy Standards in the U.S. Health Insurance Portability and Accountability Act (HIPAA).

CAUTION: Be very careful when de-identifying JPEG lossy compressed clips (multi-frame images). A modified clip will be re-compressed and lose quality every time it is saved. When working with clips, try to make all your changes at one time and Save only once. Keep a copy of your original image in case you want to reprocess the original image data later.

To remove patient identifying information burned into an image

You can erase rectangular areas of an image to the background color. Annotations & erasures always apply to all frames in a clip. **Note** that modifying some image formats (16-bit palette color or monochrome I and II) will convert the images to RGB format when they are saved, possibly increasing their size on disk.

- Double-click on an image, then click on the **Annotation** tab **Erase Rect** button.

- Hold down the left mouse button and drag the mouse to draw a rectangular area to erase. The fill color of the rectangle will be the color of the upper left corner of the rectangle.

- You can use the keyboard arrow keys to "nudge" the rectangle up/down or right/left. You can also resize a selected rectangle using the grab handles on the corners of the rectangle.

- You can draw multiple erase rectangles on an image.

- Click on the 'X' in the upper right corner of the window with the **Annotation** tab to close it.

Copy Erase Rectangles to multiple images

The patient name is often in the same place for all images in a series (grouping of images). You do not have to erase each image separately:

- Add erase rectangles to one of the images in the series window (described above).

- Select all the images in the series window that you wish to erase (Ctrl-A selects all images).

- Click on the Copy Erase Rectangles toolbar button shown above.

- Make sure the image number listed in the top field is the image you de-identified in the previous step, then click **Erase** to apply the erasure to the other images.

Once all images are erased, you can still go back and adjust the rectangles on any individual image. Once the images are Saved the rectangles will be permanently burned into the images.

Creating a Location to Save the De-identified Studies

Once a study has been de-identified you will want to save it to a DICOM Directory or to ShowCase Image Center if you are using it. A DICOM Directory is a folder with an index file to keep track of the studies and a sub-folder containing image files. Saving the study to a DICOM Directory is usually best if you want to keep the de-identified studies separate from your other studies or if you will be copying the studies to CD, DVD or a USB drive to use them elsewhere.

DICOM Directories can be used repeatedly so you may only need to create one for all your de-identified studies.

- Select **New => Dicom Folder** from the ShowCase File menu. The Windows Browse for Folder dialog appears.

- In the **Browse For Folder** window, navigate to a disk with sufficient free space and create a new folder by clicking **Make New Folder.**

- Type a name for the folder, then press the **Enter** key on your keyboard.

- Click **OK** to close the window.

- In the **Study Lists** window, click on the new tab for the DICOM Directory just created and click the **Remember this Folder** checkbox to tell ShowCase to display a tab for the DICOM Directory each time it is started.

To erase identifying information in the image headers

Patient names, patient numbers, birth dates and other identifying information is written into the DICOM header information in the image files. This preserves vital clinical information, but the data should be removed if the images are teaching files or sent to a research database.

ShowCase can remove most identifying information, while leaving information needed for clinical research.

- To de-identify the image headers select **Save Series As…** from the ShowCase File Menu.

- **Save Series As…** allows you to save the series under a new patient name. The dialog allows you to change the patient name, patient number, accession number, study description and series number.

- Set the destination to the DICOM Directory or Image Center Image Directory where you want to save the study, then click **Select**.

To remove patient identification information, check the "De-identify recommended DICOM fields" checkbox. See the table below for a list of data elements removed.

By default, the study's physician information is left in the header (elements shown shaded gray in the table below). Make sure the box **Leave physician names in headers** is not checked if you want this information removed.

* Note that **Height** and **Weight** are not removed due to research needs.

* Note that **Birth date** and time are removed but ShowCase will calculate the **Patient Age** (if missing) for research purposes. Age is calculated in years for patients greater than 3 years old, months for patients greater than 3 months old and days for patients less than 3 months old. Ages are capped at 79 years as an added privacy measure.

* **Study Date** is changed to the current date (after age is calculated) because the combination of date and study location can sometimes identify a patient.

Limitations

Studies larger than 300 MB may need to be split into two or more studies to be de-identified. In most cases ShowCase can split the studies.

Deleted DICOM Elements

DICOM Element Name	DICOM Group	DICOM Element
PatientBirthDateElement	0x0010	0x0030
PatientBirthTimeElement	0x0010	0x0032
OtherPatientIDsElement	0x0010	0x1000
OtherPtNameElement	0x0010	0x1001
PtAddressElement	0x0010	0x1040
PtMothersNameElement	0x0010	0x1060
PtMilitaryRankElement	0x0010	0x1080
PtMilitaryBranchElement	0x0010	0x1081
PtRecordLocatorElement	0x0010	0x1090
PtTelephoneElement	0x0010	0x2154
PtOccupationElement	0x0010	0x2180
PtHistoryElement	0x0010	0x21B0
PtCommentsElement	0x0010	0x4000
StudyIDElement	0x0020	0x0010
RefPhysElement	0x0008	0x0090
RefPhysAddrElement	0x0008	0x0092
RefPhysTeleElement	0x0008	0x0094
PhysicianOfRecordElement	0x0008	0x1048
PeformingPhysicianElement	0x0008	0x1050
ReadingPhysicianElement	0x0008	0x1060
OperatorsNameElement	0x0008	0x1070

WARNING: Using the ShowCase "de-identify" checkbox does not guarantee that all patient identification is removed from the image.

- ▪ If the imaging equipment manufacturer encodes identifying information in DICOM elements that are not part of the DICOM standard, that is, in "private elements", ShowCase will not know about them. You can read the DICOM elements in an image by double-clicking on the image and looking at the "DICOM Information" tab. You will see a list of all of the DICOM elements in the image header.

- ▪ You need to decide the level of security needed for your de-identified images. ShowCase does not, for example remove the institution and equipment descriptions, which might be used by a knowledgeable person to map the image to a specific patient. If you really need 100% assurance that the patient cannot be traced, you can save the image in a non-DICOM format such as a bitmap or AVI file so that NO header information is available. To export in non-DICOM formats, select the images and click the **Export** button. Then you can select the format – usually AVI files for clips and JPEG files for static images.

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