UAB Softneta
K. Barsausko st. 59, LT 51423
Kaunas, Lithuania
info@softneta.com
www.softneta.com

MedDream DICOM Viewer

USER'S MANUAL

(version 5.1)

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Table of Contents

Table of Contents 3
Notes on the user's manual 4
Purpose and availability of documentation 4
Questions and comments 4
Frequently asked questions (F.A.Q.) 4
Explanation of symbols used 5
Introduction 6
Minimal requirements 7
Minimal hardware requirements 7
Minimal software requirements 7
Installing MedDream for PacsOne Quick Install 8
Windows installation 8
Linux installation 9
Logging on to MedDream 11
Search of studies 12
Opening multiple studies 17
Reading study reports 19
Viewing and analyzing images 21
Viewing one or multiple studies 21
Comparing multiple studies 23
Image localization 24
Manipulating images 25
Cine mode 28
Multi-planar reconstruction (MPR) 29
Measuring Images 32
Printing images and series 43
Saving images 44
Export and forward study 45
MedDream DICOM Viewer Mobile Version 47
Logging on to MedDream Mobile 47
Search of studies on Mobile Version 48
Manipulating images on Mobile Version 52
Measuring Images on Mobile Version 54
System menu functions on Mobile Version 57
MedDream DICOM Viewer on HTML5 platform 59
Logging on to MedDream HTML5 platform 59
Search of studies on HTML5 platform 60
Manipulating and analyzing images on HTML5 platform 64
Measuring images on HTML5 platform 69
Saving Annotations on HTML5 platform 72
Export and Forward on HTML5 platform 75
System menu functions on HTML5 platform 77
Report module 79
ECG module 81
SR view 86
PDF view 87
Video view 88
Settings 89
Default Viewer 95
License registration 96
Information window 97
Table of Figures 98
Index 103

Notes on the user's manual

Purpose and availability of documentation

This user`s manual describes the operation with MedDream DICOM Viewer (hereinafter – MedDream).

Correct operation of the system is imperative for its safe and successful functioning. You should therefore ensure that you are thoroughly familiar with the user manual before setting up and using MedDream for the first time.

The user manuals and other documentation enclosed with MedDream should be kept accessible to users at all times to ensure that the information required for the use of MedDream is readily available.

MedDream DICOM Viewer is not intended to replace skilled and qualified medical professional. The software should only be used by people who have been trained and is acquainted with its functions, capabilities and limitations.

Users must be aware that the quality, accuracy and correctness of the output data displayed on the screen, printed or exported from MedDream depends on the quality, accuracy and correctness of the input data, the user`s interface with the data, the quality, calibration and other parameters of printer or monitoring device.

MedDream has been tested extensively, however, it is possible that errors may remain/emerge in the software. Users must be aware of the potential for errors and in case of an error or for other assistance, please contact Softneta, UAB Customer support:

- write an e-mail info@softneta.com

MedDream saves images and studies together with patient, organization and other information while exporting from the Viewer. Users must ensure that the data will not be accessed by unauthorized people.

MedDream measuring functions are approximate and cannot be used for diagnostic purposes.

Questions and comments

If you have any questions or comments regarding this user`s manual, please contact Softneta UAB Customer support: support@softneta.com.

Frequently asked questions (F.A.Q.)

Please visit our FAQs page to search through our database of known questions and issues, or even contact our support team if you can’t find what you are looking for.

Explanation of symbols used

The symbols used in this daily workflow refer to important safety information which warn against possible health risks or fatal injuries and contain useful notes. Whenever you see these symbols, read the accompanying information carefully and observe all safety notes and information in the user manual, daily workflow and on the device labels.

WARNING
Indicates a hazardous situation which may result in a fatal or serious bodily injury if the appropriate safety precautions are not heeded.

CAUTION
Indicates a hazardous situation which may result in a minor injury if the appropriate safety precautions are not heeded.

CAUTION
Indicates possible damage if the appropriate safety precautions are not heeded.

Information, hints and advice for a better understanding of the instructions to be observed in the operation of the instrument.

Introduction

MedDream DICOM Viewer is a Flash/HTML based package for PACS server which is designed to aid professionals in every day's decision making process, connecting all the medical data into a unified and fast performing network. MedDream ensures a fast and reliable way to search, present and analyze the medical data (images and video files) on various devices: computers, smart phones, tablets (near future) and so forth.

MedDream covers: radiology, cardiology, oncology, gastroenterology and many other fields of medical application. It seamlessly integrates with various medical imaging devices, such as: ultrasound (US), magnetic resonance (MRI), positron emission tomography (PET), computed tomography (CT), endoscopy (ES), mammograms (MG), digital radiography (DR), computed radiography (CR) ophthalmology, and so forth.

Core MedDream DICOM Viewer uses are:

- Replacement of hard copies, e.g. film archives, paper documents, etc.
- Remote access. MedDream provides a possibility to be mobile and work from any place in the world where the Internet is accessible. More than one person can access and view medical records at one time. Such functionality speeds up the collaboration among the professionals. So that a doctor in the hospital and a doctor that is in the different location may view the medical data and discuss about it simultaneously. The patient's medical history, various studies and images are found much faster comparing to the conventional paper-based methods.
- MedDream can be used as a standalone WEB Viewer or integrated into PacsOne PACS, dcm4chee Archive, Conquest PACS, ClearCanvas PACS systems. Moreover, MedDream can be adapted to client's PACS system and easily integrated into RIS/HIS workflow.
- MedDream has multiple functions such as search of studies, viewing, analyzing, saving, exporting, forwarding images and videos, etc.

MedDream cannot guarantee the accuracy of calibration data received from the modality. Moreover, Softneta cannot guarantee that the manual calibration which is performed by users is done accurately.

Measuring function is approximate and cannot be used for diagnostic purposes.

Minimal requirements

Minimal hardware requirements

Parameter	Requirement
Processor	2.33GHz or higher x86-compatible
Memory	2 GB
Hard drive	10 GB (RAID 1, RAID 5, RAID 10)
Network Interface	100 Mbit/s

Minimal software requirements

- Windows Server 2008 (32 bit and 64 bit), Windows 7 (32 and 64 bit), Linux (32 bit and 64 bit, with glibc version >= 2.5).
- Internet Explorer 10.0 or later, Mozilla Firefox 25 or later, Google Chrome 40 or later.

Installing MedDream for PacsOne Quick Install

Under Windows, a thread-safe (TS) 32-bit PHP build is required. The DLLs included won't work with a 64-bit PHP, like in 64-bit builds of WampServer. The 64-bit build of PacsOne which appeared recently also requires a 64-bit version of MySQL (and consequently PHP and Apache), therefore it is incompatible with MedDream.

Under Linux, a non-TS PHP build is required. This is related to a more common build of Apache, the "prefork". The "worker" build is incompatible.

PHP 5.3 is built for Windows either with VC6 or VC9 runtime. Take note which version you have, and use a corresponding .dll during installation as explained below. Otherwise you'll get an error message like this one:

```
Module compiled with build ID=API20090626,TS,VC6
PHP    compiled with build ID=API20090626,TS,VC9
These options need to match
```

Under Linux, the .so file requires glibc 2.5 or later.

Under Linux, PacsOne's custom libjpeg conflicts with standard libjpeg needed by the GD2 extension on which MedDream depends heavily at the moment. You will need to disable the antispam image in order to log in to PacsOne web interface (to do that, place an empty file "no.antispam.code" near PacsOne.exe). You also won't be able to view DICOM images in PacsOne; on the other hand, MedDream adds a Show button to the web interface and thus can be used instead of the built-in viewer.

During an upgrade it's recommended to use the included config.sample-pacsone.php as a template and then update the resulting config.php according to the old one. This will prevent misunderstandings like variable names which were suddenly changed.

Since 3.06.1103.3003, a DICOMDIR viewer in the subdirectory "DICOMDIR" is automatically included on export. However, an alternative way is to use PacsOne's "Include external viewer" functionality. If you use the latter, and still keep the viewer in the subdirectory "DICOMDIR", MedDream Export function might fail due to same files included twice. The solution is to rename the subdirectory, or move it somewhere outside the MedDream directory tree.

MySQL from XAMPP 1.8 for Windows: if MedDream or PacsOne web interface connects to the database very slowly (each attempt takes about 1 second), then try adding "bind-address = ::" to my.ini.

While still in demo mode, you *must* remove the existing meddream.lic after changing computer's host name (any OS), reinstalling the OS (Windows) or changing the MAC of any network card (Linux). A correct file will be created automatically. Otherwise a commercial license generated from your meddream.lic will not work. This also means that Windows must be activated in advance!

PacsOne doesn't have an index on series.modality. If searches with a particular modality are unacceptably slow compared to the default set of checkboxes, then you'll need to use the following MySQL command:

```
ALTER TABLE series ADD INDEX (modality);
```

Windows installation

1. Copy meddream folder to C:\Program Files\PacsOne\php

   (the result: C:\Program Files\PacsOne\php\meddream)

If you are updating older version of MedDream:

a) Please back up the old version (so you can go back any time).
b) Please do not replace files you changed in last version. You must carefully synchronize the new version.

2. (optional) From C:\Program Files\PacsOne\php\meddream Copy and Replace applet.php to C:\Program Files\PacsOne\php.

   It is advised to make a backup beforehand in case you'll need to uninstall MedDream later.

3. From C:\Program Files\PacsOne\php\meddream

   copy php5.3_meddream-VC6.dll to PHP_INSTALL_DIR\ext (if you are using PHP 5.3.x, VC6 build)
   copy php5.3_meddream-VC9.dll to PHP_INSTALL_DIR\ext (if you are using PHP 5.3.x, VC9 build)
   copy php5.4_meddream.dll to PHP_INSTALL_DIR\ext (if you are using PHP 5.4.x)
   copy php5.5_meddream.dll to PHP_INSTALL_DIR\ext (if you are using PHP 5.5.x)
   copy php5.6_meddream.dll to PHP_INSTALL_DIR\ext (if you are using PHP 5.6.x)

4. Add to php.ini file

   "extension=php5.3_meddream-VC6.dll" (if you are using PHP 5.3.x, VC6 build)
   "extension=php5.3_meddream-VC9.dll" (if you are using PHP 5.3.x, VC9 build)
   "extension=php5.4_meddream.dll" (if you are using PHP 5.4.x)
   "extension=php5.5_meddream.dll" (if you are using PHP 5.5.x)
   "extension=php5.6_meddream.dll" (if you are using PHP 5.6.x)

5. Specify date.timezone in php.ini:

```
[Date]
; Defines the default timezone used by the date functions
date.timezone = "America/Chicago"
```

   (the list of possible values is at http://www.php.net/manual/en/timezones.php)

6. Edit APACHE_HTDOCS_DIR/meddream/config.php file. Use config.sample-pacsone.php as a template. The file contains basic instructions.

7. Restart Apache

8. 8. Navigate to http://127.0.0.1/pacsone/meddream/home.php (use PacsOne users to log in) or use "Show" button in PacsOne web interface.

Linux installation

1. Copy the "meddream" directory to PACSONE_INSTALL_DIR/php

   (so that the result is PACSONE_INSTALL_DIR/php/meddream; for example, in our machines it usually is /home/pacsone/php/meddream.)

   Adjust permissions: no less than

   0777 for PACSONE_INSTALL_DIR/php/meddream
   0777 for PACSONE_INSTALL_DIR/php/meddream/log
   0777 for PACSONE_INSTALL_DIR/php/meddream/temp

   If you are updating an older version of MedDream:

   a) Please back up the old version (so you can go back any time).
   b) Please do not replace files you changed in last version. You must carefully synchronize the new version.

2. From PACSONE_INSTALL_DIR/php/meddream Copy and Replace applet.php to PACSONE_INSTALL_DIR/php

3. From PACSONE_INSTALL_DIR/php/meddream

   copy php5.3_meddream.so to /usr/lib/php/modules (if you are using PHP 5.3.x)
   copy php5.4_meddream.so to /usr/lib/php/modules (if you are using PHP 5.4.x)

copy php5.5_meddream.so to /usr/lib/php/modules (if you are using PHP 5.5.x)
copy php5.6_meddream.so to /usr/lib/php/modules (if you are using PHP 5.6.x)
copy php5.3_meddream-x86_64.so to /usr/lib64/php/modules (if you are using PHP 5.3.x under a 64-bit OS)
copy php5.4_meddream-x86_64.so to /usr/lib64/php/modules (if you are using PHP 5.4.x under a 64-bit OS)
copy php5.5_meddream-x86_64.so to /usr/lib64/php/modules (if you are using PHP 5.5.x under a 64-bit OS)
copy php5.6_meddream-x86_64.so to /usr/lib64/php/modules (if you are using PHP 5.6.x under a 64-bit OS)

4. Add to /etc/php.ini file

   "extension=php5.3_meddream.so" (if you are using PHP 5.3.x)
   "extension=php5.4_meddream.so" (if you are using PHP 5.4.x)
   "extension=php5.5_meddream.so" (if you are using PHP 5.5.x)
   "extension=php5.6_meddream.so" (if you are using PHP 5.6.x)
   "extension=php5.3_meddream-x86_64.so" (if you are using PHP 5.3.x under a 64-bit OS)
   "extension=php5.4_meddream-x86_64.so" (if you are using PHP 5.4.x under a 64-bit OS)
   "extension=php5.5_meddream-x86_64.so" (if you are using PHP 5.5.x under a 64-bit OS)
   "extension=php5.6_meddream-x86_64.so" (if you are using PHP 5.6.x under a 64-bit OS)

5. Specify date.timezone in php.ini:

   ```
   [Date]
   ; Defines the default timezone used by the date functions
   date.timezone = "America/Chicago"
   ```

   (the list of possible values is at http://www.php.net/manual/en/timezones.php)

6. PacsOne and Apache must run as the same user because newer versions of PacsOne create subdirectories with permissions too strict for different users.

7. Edit APACHE_HTDOCS_DIR/meddream/config.php file. Use config.sample-pacsone.php as a template. The file contains basic instructions.

8. Restart Apache

9. Navigate to http://127.0.0.1/pacsone/meddream/home.php (use PacsOne users to log in) or use the "Show" button in the PacsOne web system.

10. FFmpeg is required in order to display thumbnails of MPEG2 DICOM files. It is expected at /usr/bin/ffmpeg .

    Not every distribution has it. Sometimes it is possible to download separate dependencies from sites like rpmfind.net and install these manually.

11. mkisofs is required for the Export command. If your distribution has only genisoimage, then you need to create a symlink to it named "mkisofs".

12. To display SR files, we are using a prebuilt binary meddream/dcmtk/dsr2html from DCMTK 3.6.0. If your distribution provides another version of it that works better, then you'll need to replace "dsr2html" and "dicom.dic" with symlinks to your copies.

13. To display non-BD-compatible MPEG4 videos (Transfer Syntax UID 1.2.840.10008.1.2.4.102), latest version of FFmpeg might be required.

Logging on to MedDream

To log on to MedDream, please do the following:

- Enter the address given by your administrator in your Internet Browser. The following screen will appear:

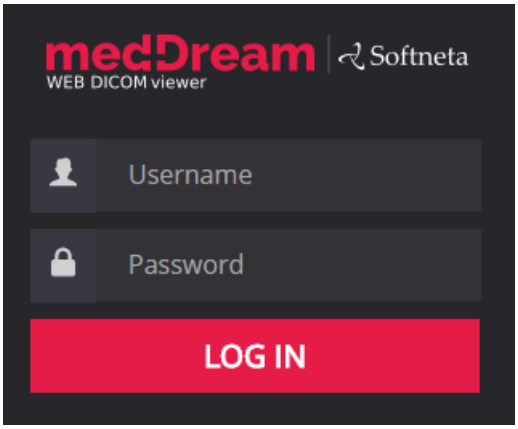


Figure 1. Logging in.

- Enter the username you were given in the field "**Username**"
- Enter the password in the field "**Password**". If you forgot your password, please contact your system administrator.

☞ Please note! On the right upper corner of the login window you can change the language: LT (Lithuanian), RU (Russian) and EN (English).

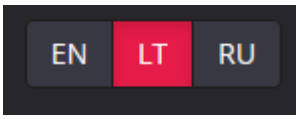


Figure 2. Language selection in a Log in window.

Search of studies

Search menu will help you quickly find the studies you need. We recommend using all possible search menu options in order to get the most accurate search results and save your time.

To find a study, please follow these steps:

1. Once you login such window appears on the screen.

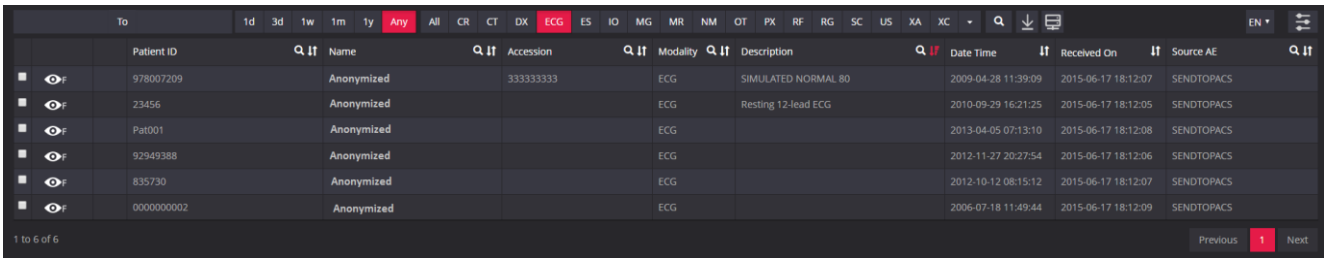


Figure 3. "Search" window

2. Enter **search criteria** (Patient ID, Patient Name, Accession Number, Study Description, Source AE). Type the information in according fields.

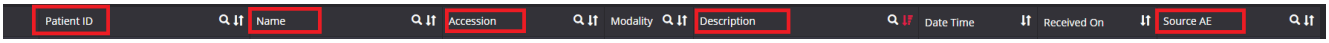


Figure 4. Search filters.

The criteria are as following:

- **"Patient ID"** - enter patient's ID number in the search field
- **"Patient Name" -** enter the patient's name or surname in the search field

☞ It is not possible to search for Ideographic and Phonetic versions of patient names. The search is performed only against the basic version (Alphabetic), even if the image contains the other two versions and the PACS supports them.

- **"Accession"** – enter the number of accession
- **"Description"** – enter few keywords from the study description
- **"Source AE"** – "Application Entity" - title of the device from where the study was sent to the PACS.

Each of the field has ⇅ button. You can arrange each of them in ascending or descending order. Click once and the order of the selected field will change from ascending to descending and vice versa.

- Ascending – arranged from smallest to largest (increasing);
- Descending – arranged from largest to smallest (decreasing).

3. To specialize the search, please select **the date interval** when the study could have been done. This can be done using **two different date interval search criteria**.

→To select the study date you can choose from the super quick pick list (*Figure 5*) accordingly to the date interval you need your studies to be from: "**1d"** (current day), "**3d"** (3 days interval), "**1w"** (1 week interval), "**1m"** (1 month interval), "**1y**" (1 year interval) or "**Any"** (no specific date interval):

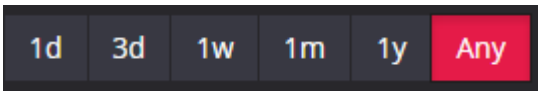


Figure 5. Search according to dates.

→ To specify the study dates click on left top corner and choose the date interval from the pop-up window (*Figure 6*).

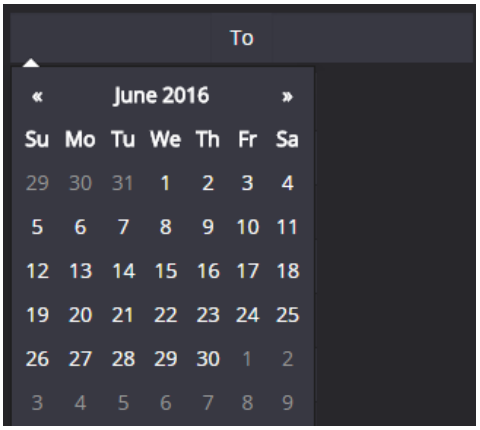


Figure 6. Date search options.

4. The search can also be specified by selecting the method which was used to obtain the study images (modalities):

- Tick the field next to one or more methods (devices) that were used in the required study (please look below for the meaning of the abbreviations)

→ CR, CT, DX, ECG, ES, IO, MG, MR, NM, OT, PX, RF, RG, SC, US, XA, XC, All. The system allows to select a few image modalities by default. Click the "triangle" icon marked in red (*Figure 7*) and now you can add all possible methods by clicking on the modality you want to be added to the search.

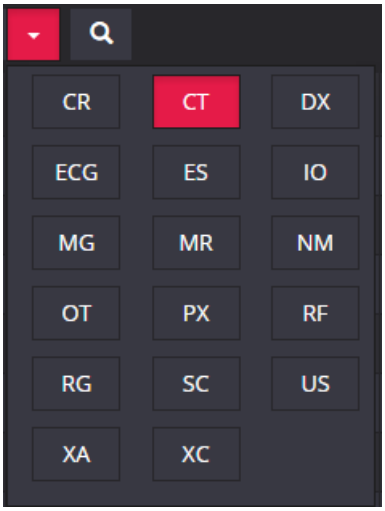


Figure 7. Search according to modalities.

If you are searching for some rare modality that has no corresponding button here, try to enter its abbreviation directly into the name of "Modality" column (Fig. 4).

Moreover, you can select all possible methods by clicking the “All” button:

Figure 8. Modalities search: All.

Abbreviations:

CR – *Computed Radiography*

CT – *Computed Tomography*

DX – *Digital Radiography*

ES – *Endoscopy*

IO – *Ultra-Oral Radiography*

MG – *Mammography*

MR – *Magnetic Resonance*

NM – *Nuclear Medicine*

OT – *Other*

PX – *Panoramic X-Ray*

RF – *Radio Fluoroscopy*

RG – *Radiographic Imaging*

SC – *Secondary Capture*

US – *Ultra Sound*

XA – *X-Ray Angiography*

XC – *External camera photography*

ECG - *Electrocardiography*

5. After you have selected your search criteria, start the search by clicking "**Search**" icon

6. Click on the icon so you could see the image you want to analyze on Flash platform (*Figure 9*) and a new browser tab will pop-up (marked in red).

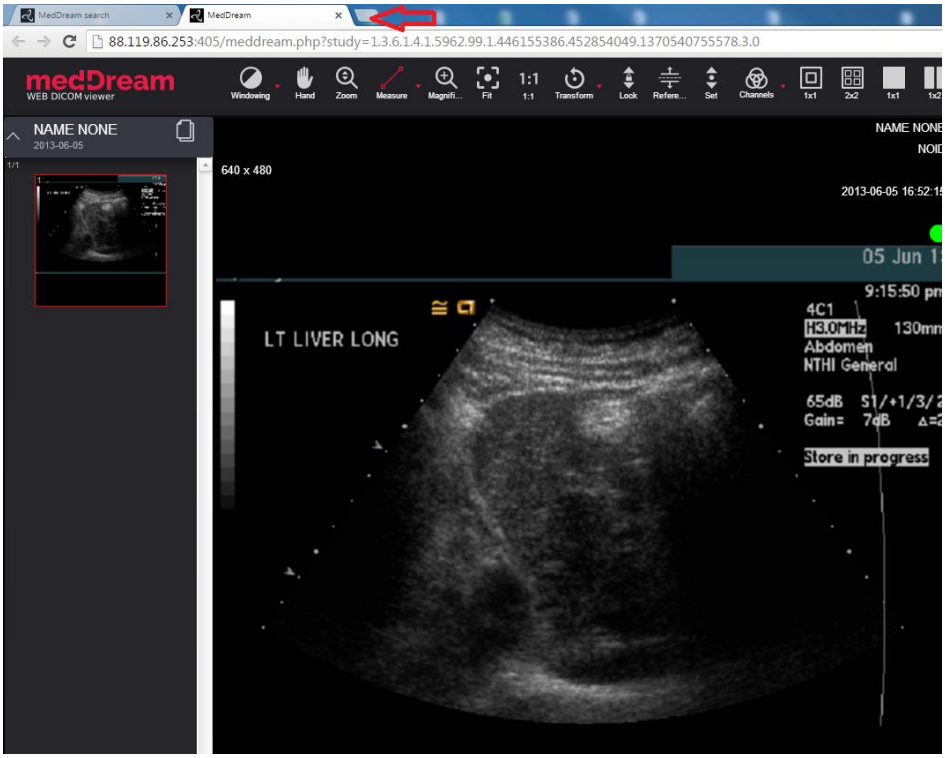


Figure 9. Search results on Flash platform.

7. To view the image move the mouse cursor on the small image on the left, click the left mouse button and drag the image to the field on the right. Now you should be able to view your image.

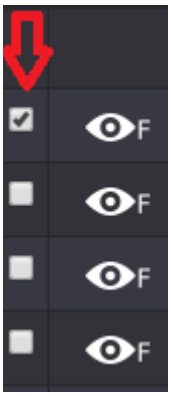


Figure 10. Tick box.

In order to save or export desired images there is a **“Tick box”** on the main Search window for your convenience.

- move your mouse cursor to the left side of the screen, next to the eye icon.
- click the left mouse button on the “Tick box”:
- keep repeating the above mentioned steps and tick as many studies as you want.
- once you have done this, you will be able to either save or forward the selected images.

Button allows you to save the selected images. Click on the icon and the selected images will be saved.

- click on the icon and the pop-up window will appear:

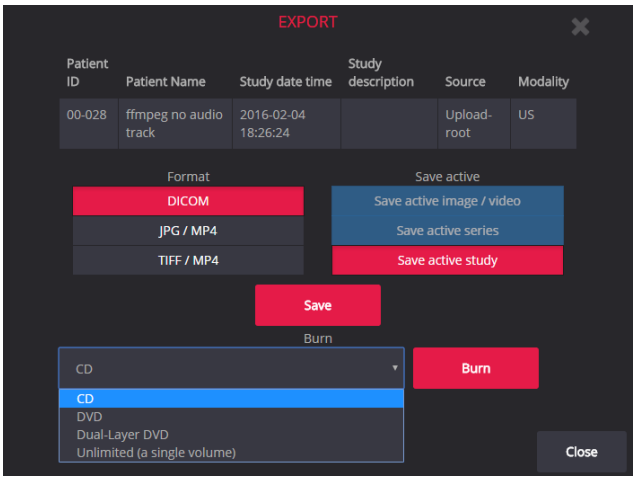


Figure 11. Export function.

To export the study (to burn it on a CD):

- choose CD, DVD or other volume size. (Splitting into volumes is currently supported only under PacsOne.)
- click “**Burn**”.

After a while two buttons "Download ISO" and "Burn ISO" will appear for every created volume. Click "Download ISO" in order to download a disk image with the .iso file extension, and burn it with your favorite CD/DVD burner software. Click "Burn ISO" if you have installed a corresponding product by Softneta, MedDreamBurn; then a third–party CD/DVD burner will start automatically.

To export the study (to save it):

- choose the format, then select to save an image, a series of images or an active study;
- click “**Save**” and choose a folder where you prefer to save the images in your computer. Click **“Save”** again.

Button allows you to forward the selected images. Click on the icon and the selected images will be exported.

- click on the icon and the pop-up window will appear:

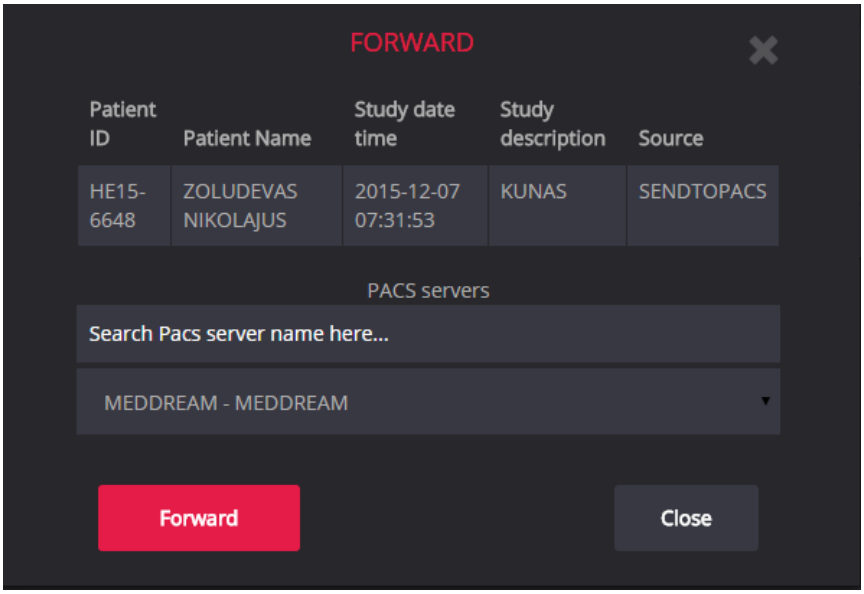


Figure 12. Forward function.

- choose a device from the list where you want to forward your study or type it in a search box to make it easier and faster.
- click **Forward** to initiate the process.

Annotations and **Reports** in the main search window have an indication icon accordingly:

- Annotation icon on the main search window.

- Report icon on the main search window.

☞ Please note! Editing and review of **Annotations** are only available on HTML5 platform. Editing and review of **Reports** are only available on Flash platform.

Opening multiple studies

If you need to open more than one study (e.g. to compare them), please do the following:

1. Select one of the studies you want to add with one mouse click;

2. Click on the icon which appears next to the study in the main search result window and a new browser tab will pop up:

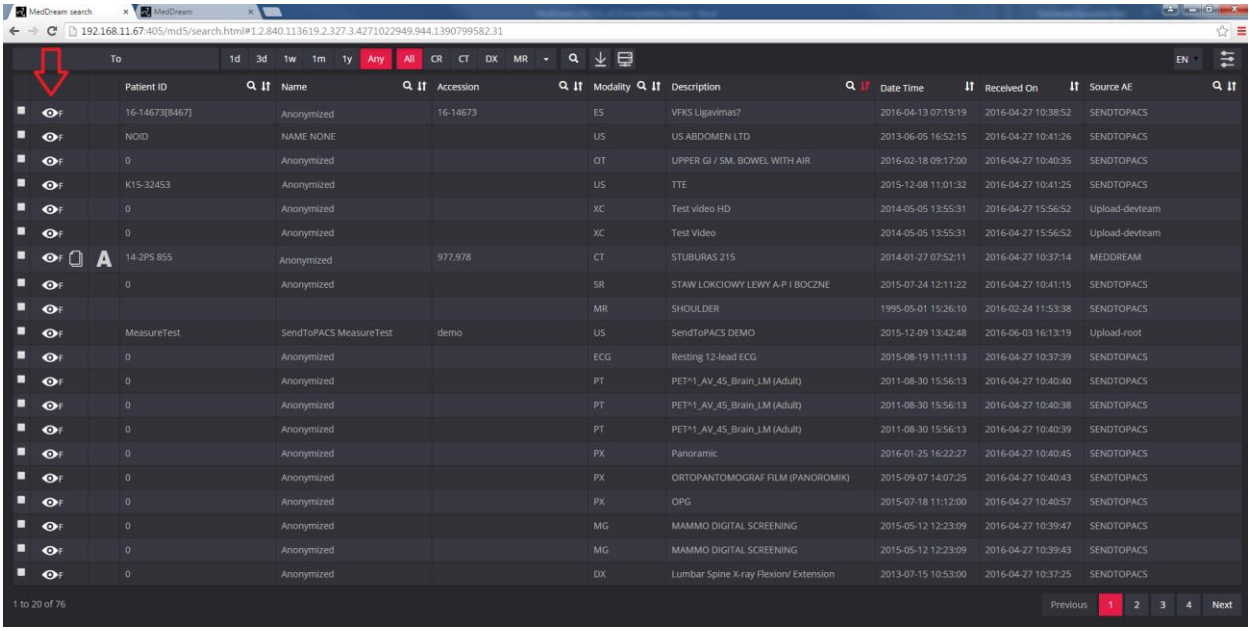


Figure 13. Study selection.

3. Go back to the search result window.

4. Click the icon again and the added study appears on the same search result pop-up window as the previous search did.

5. Information table will pop up on the right bottom corner of the main search result window stating the following (only on the main search of HTML5 platform):

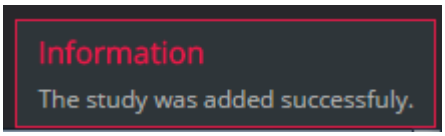


Figure 14. Information table on HTML platform.

6. Go back to the search result window.

7. Select the next study you want to add and repeat steps 1 – 3 that were mentioned above. Keep doing this till you open enough studies that you need for your analyses and comparison.

After selecting all the studies, you will see all study series displayed in the pane on the left. When you select the study and click on it, you will see the image icons of the study series:

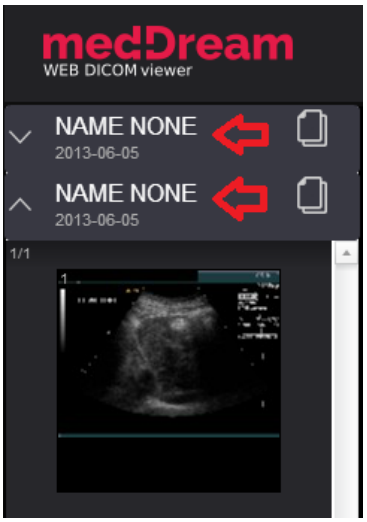


Figure 15. Opened multiple studies.

In order to navigate through the study series, just click on the header to activate it and see the image icons.

Reading study reports

In the study pop-up window you can notice that some of the studies have reports. This is indicated by the “Report” icon, which appears on the top left corner next to the study.

Figure 16. Study Report icon location.

To read a report:

- select a study with the “Report” icon:

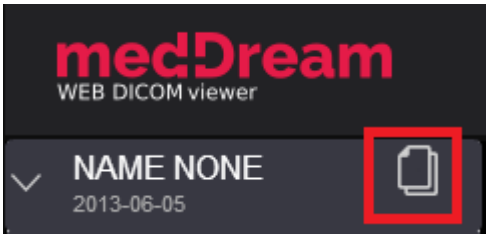


Figure 17. Report icon on the study file.

- click the “Report” button once to open the report. A report window will appear:

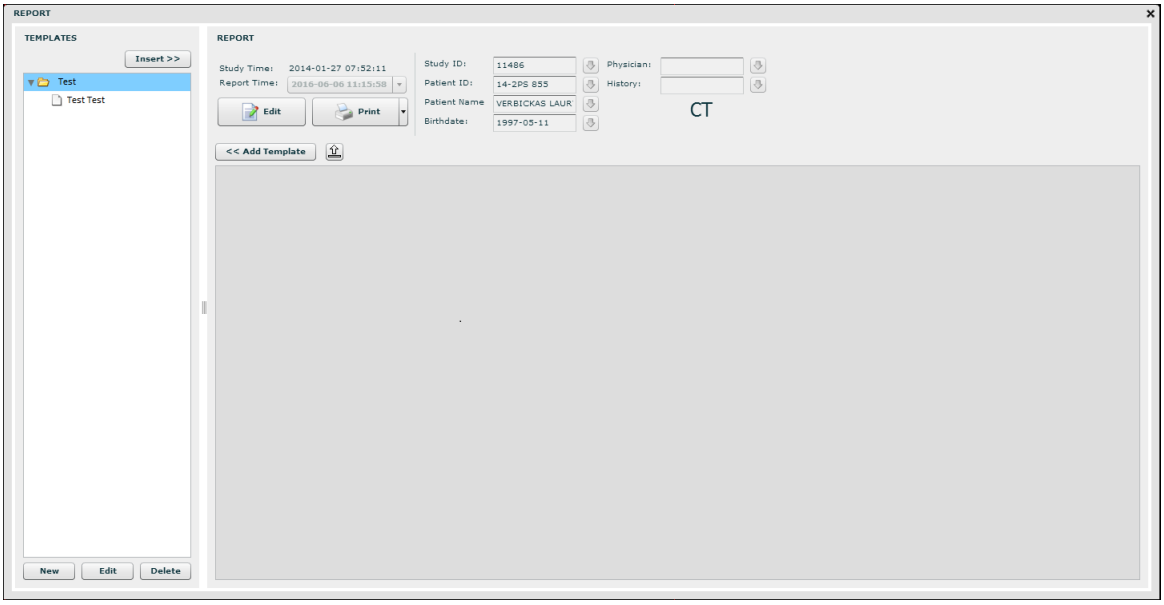


Figure 18. Study report.

- it opens a separate Report window, which can fully employ Report functions — edit and print the study reports.

A legacy product, MedReport, integrates into MedDream identically. It is superseded by the Report module. However, even after installing the license that enables this module, MedReport will still be called if it is integrated into MedDream. You will need to disable the integration (`$medreport_root_link` in config.php) in order to use the Report module instead.

The report of the study may be indicated by two different buttons:

If the “Report” button is empty, the report itself is also empty - **single** report icon (the doctor can fill it). Please refer to the page 71 for more information.

If the “Report” button appears "full" - the **double** report icon (the doctor can read, edit or print it).

- click the button on the top right corner to exit the report window.

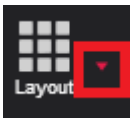
Viewing and analyzing images

Viewing one or multiple studies

After opening one of the study series, you can rearrange the preview window as you prefer. First of all, you can choose on which side of the screen - left or bottom - you want to see reduced study images. Just click the

button on the menu bar and change the preview window as you prefer.

Secondly, you can choose how many panes with study images there will be in the window. You can choose from one to nine panes with different images. If you want to open more panes do the following:

- click “Screen layout” on the menu bar: 

- choose from the list how many panes you want. For example, if you need to see 4 screens with different images, select „2x2 Screen layout”. There are two possible ways to select screen layout:

    1. from the list,
    2. from the toolbar: 1x1, 1x2, 2x2.

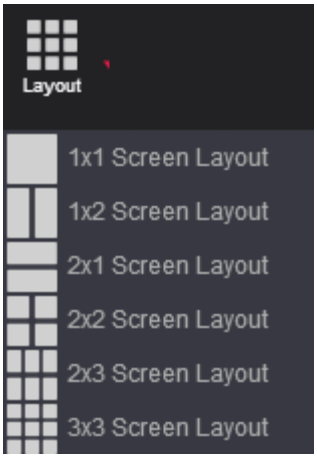


Figure 19. Screen layout. Option No.1.

Figure 20. Screen layout. Option No.2.

After selecting how many screens you want to see in the window, move the images into them. There are two methods to do this:

First method:

- select the image icon from the study series that are displayed on the left (or on the bottom, depending on how you have rearranged the display)
- drag-and-drop the image into the pane where you want the image to be:

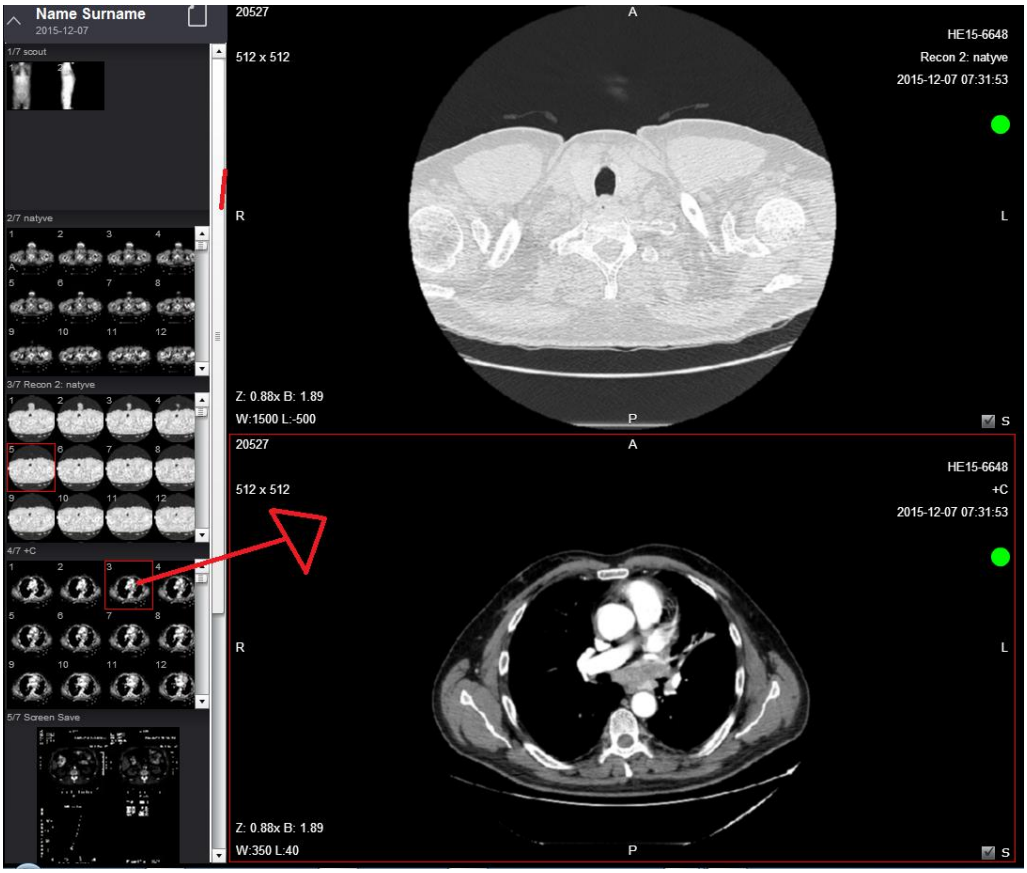


Figure 21. Drag-and-drop the image into the pane.

Second method:

- select the pane where you want to move the image with one mouse click. The active pane will be outlined in red.
- select the image icon from the study series that are displayed on the left (or in the bottom, depending on how you have rearranged the display)
- double click on the image that you want to move into the pane.
- the image will appear in the selected pane.

These are the ways how you can move the images from the series into the main window. You can select and compare images not only from one study, but from multiple studies as well.

Also you can choose the button which divides the selected section into several sections. Once you have selected **Multiple viewport** button drag the studies to the field. The study and all the following images that you want will appear on the selected field.

Figure 22 Multiple layout: 1x1 and 2x2.

Note! All the image manipulation functions affect the entire set of images opened in a multiple viewports mode (such as "Scroll", "Brightness/Contrast", "Rotate", "Pan", "Reset"). For example, if you select "Bone" contrast mode it will apply the "Bone" mode to all images that are viewed through the multiple viewports mode though the changes does not apply to the image which is not viewed via multiple viewports. (see Figure 22).

Comparing multiple studies

To compare multiple studies you can use the **"Lock Scroll"** button. It allows you to either move through images one at a time or easily scroll though the images of a series:

- Select the studies that you want to compare.
- From each study select and move the first images into the viewing panes
- Click **„Lock Scroll"**.

- When this button is active (is outlined in red

), you will change all images simultaneously (scroll through the images of a series) by scrolling the mouse wheel.
- If the button is inactive, you will move through images one at a time by scrolling the mouse wheel.

*NOTE: when the **"Lock scroll"** button is active, you can move through images with the help of keyboard arrow keys, not only by scrolling the mouse wheel.*

Image localization

Overlaying reference lines allow you to indicate the location of an image slice on another image of an intersecting pane.

- Select the images that you want to compare and move them into the panes:
- Select one of the image you want to know the location of in regard to other images.
- Click the button **„Reference Lines“:**

- yellow lines appear in the images, indicating the location of the selected image:

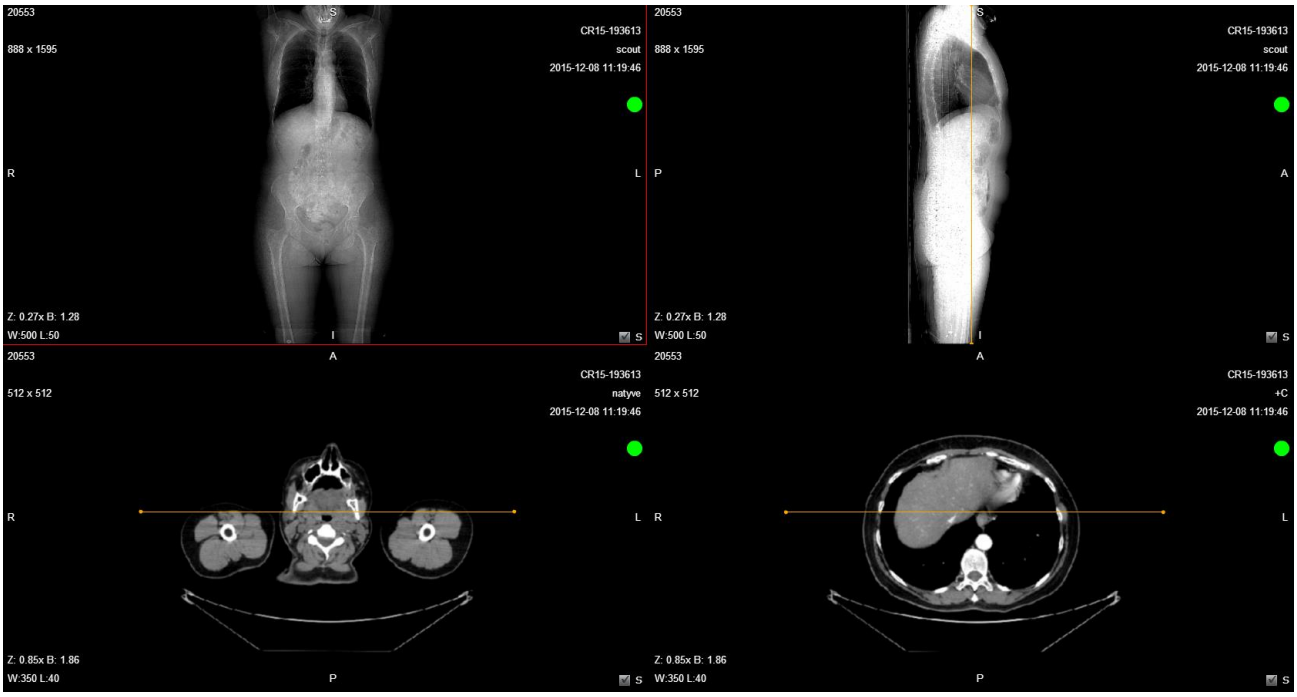


Figure 23. Reference lines option.

Manipulating images

You can manage and analyze the study images according to the criteria you need. The following buttons are used for this:

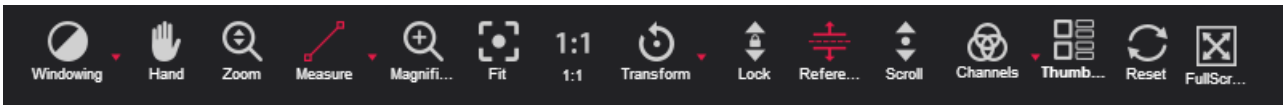
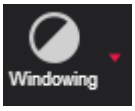


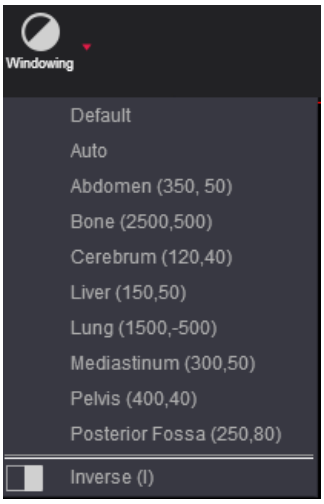
Figure 24. Image manipulation tools.

All manipulation buttons are deactivated for video view.

More about each of them:



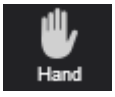
Button is used to adjust the Level/Window (contrast and brightness) of the image. A pop-up menu appears:



You can select one of the standard contrast settings:

Default *– a preset setting from the image itself (if available).*
Auto *– the system analyses the image and adjusts the brightness and contrast automatically.*
Abdomen *– a preset setting for abdomen studies.*
Bone *– a preset setting for bone studies.*
Cerebrum *– a preset setting for cerebrum studies.*
Liver *- a preset setting for the liver studies.*
Lung *– a preset setting used for studying the images of the lungs.*
Mediastinum *- a preset setting for mediastinum studies.*
Pelvis *– a preset setting for pelvis studies.*
Posterior Fossa *- a preset setting for Posterior Fossa studies.*
Inverse *– the user can inverse the image.*

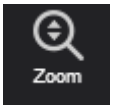
Figure 25. Level/Window button options.



"**Hand**" button allows you to position images within the pane. This feature is especially useful when the image is larger than the pane, as it usually is after zooming in.

To move an image within the pane:

- On the Tools menu, click "**Hand**"
- Position the cursor over the image you want to move and click-and-drag the cursor around the pane to move the image.
- Release the mouse button to leave the image in its new position.

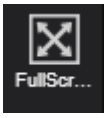


"Zoom" button is used to increase and decrease the selected image.

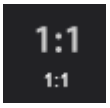
There are two ways to zoom in and zoom out an image:

Click on the Keyboard **+** to **Zoom In** and **–** to **Zoom Out;** click the left button on your mouse and drag it upwards to zoom in and downwards to zoom out.

"Fit to Screen" button**.** When you click this button, the size of the image is automatically adjusted so that the image would fill the entire screen. For example, if only part of the image is visible on the screen, choose this button to see the whole image displayed on the entire screen.

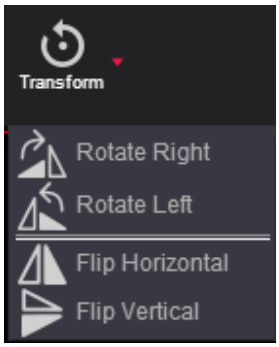


"Full Screen" button. Move your mouse cursor to the upper right corner of the screen. Click on the Full Screen icon and the Full Screen mode will be enabled. Click either the icon once again or ESC button at your keyboard in order to exit the Full Screen Mode.



"1:1 Resolution" button allows you to restore the original image size.

"**Transform**" button allows you to rotate the image. Click the arrow to the immediate right of the "Transform" and select one of the options from the pop-up menu:



- Rotate Right – to rotate the image 90° clockwise;
- Rotate Left – to rotate the image 90° counter-clockwise;
- Flip Horizontal – to flip an image 180° about the horizontal axis;
- Flip Vertical – to flip an image 180° about the vertical axis.

Figure 26. Transformation possibilities.

"**Inverse**". This button is used to invert the image. To invert the image, click the button once. If you click the button second time, the image returns to the previous state:

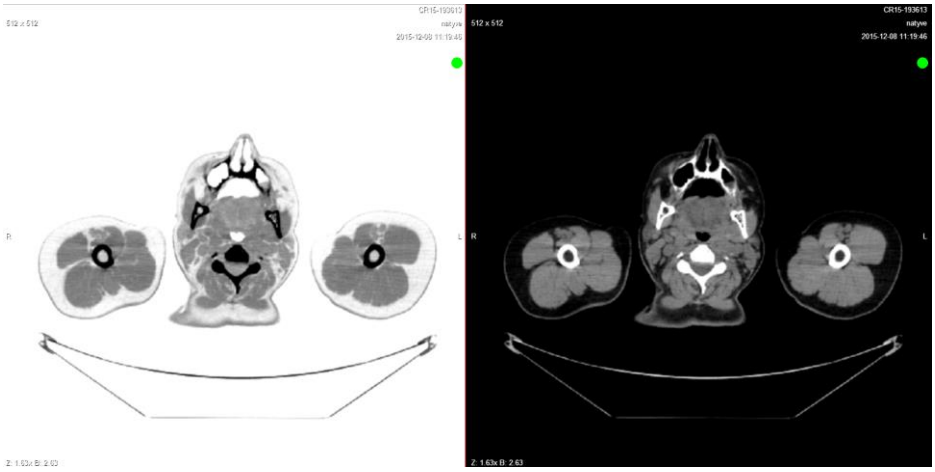
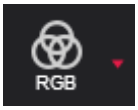


Figure 27. Inverted image.



“Channels” Highlight a color component or a combination of them in the image by showing selected color in white shades and other colors in black. This tool is enabled for image view. Click the red arrow in order to choose from the list.

“Set scroll” enables to scroll images by draging mouse on the image from one side to the other. Button functions as a mouse wheel. Only in this case you need to click the left mouse button and drag it to the left or right to change the image view.

“Magnifier” button is used to magnify (enlarge) the certain area of the image. Click the icon once in order to enable the function, click the icon once more and the mode will be disabled.

“Thumbnails” button is used to position the thumbnails to the left or bottom of the screen.

“Reset” button restores the study image to the previous original state.

Cine mode

Using **“Cine mode”** you may put all images into one movie. Just click on the Cine mode icon and the process will start.

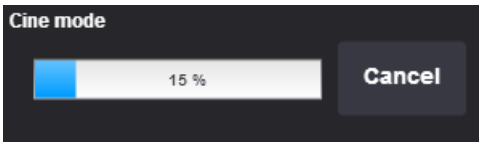


Figure 28. Opening Cine mode function.

This function allows you to play images as one movie (one image – one frame).

Figure 29. Playing images as one movie.

To turn the Cine mode off, just open one of the images again.

Multi-planar reconstruction (MPR)

Multi-planar reconstruction (MPR) is the simplest method of reconstruction. A volume is built by stacking the axial slices. The software then cuts slices through the volume in a different plane.

In order to open this function you have to click on the

button. A pop-up window appears. There you have to fill two input boxes:

- Start Frame – number of the first frame of selected series;
- End Frame – number of the last frame of selected series.

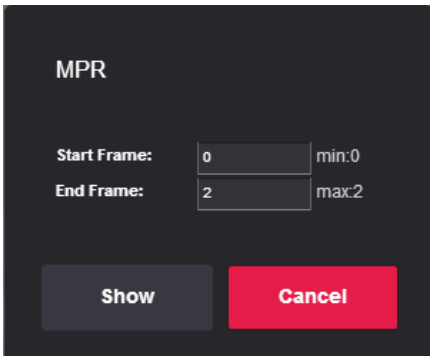


Figure 30. MPR frame selection.

User can input the range from which MPR will be calculated. After you enter the frame range, click "**Show**" and the loading will start. It might take some time to load all frames. This will be indicated by the following progress window:

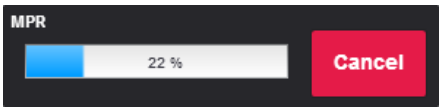


Figure 31. Loading MPR.

Once the loading MPR process has been finished, the **Warning message** may appear stating that the "*Image slice can be incorrect, due to different images*".

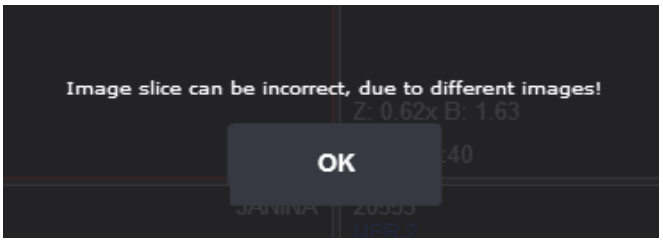


Figure 32. Warning message.

After the loading is finished, the MPR window appears:

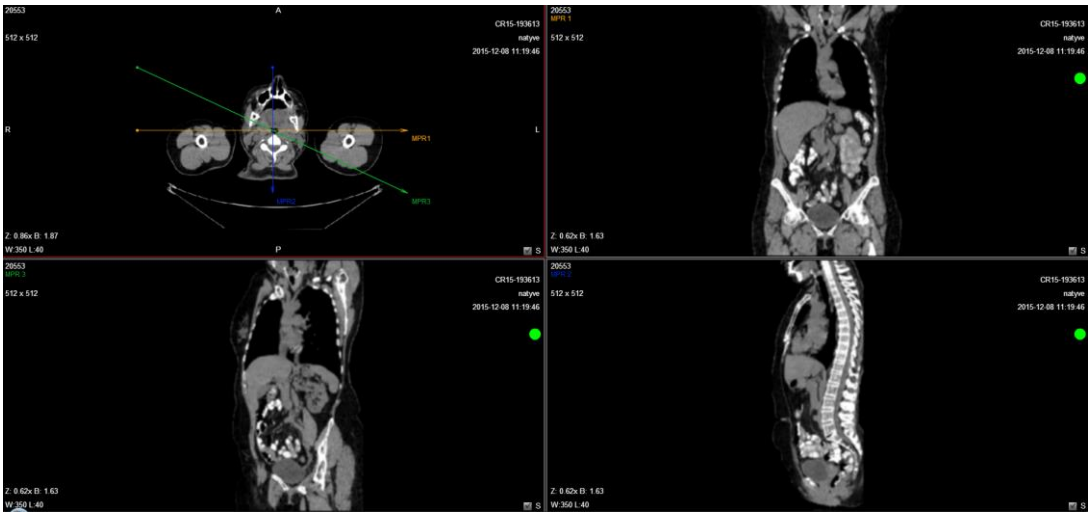


Figure 33. MPR.

The top picture on the left is the main one. You can see three arrows which can be moved in order to see different planes and the optimal plane can be chosen to display an anatomical structure. This may be particularly useful for visualizing the structure of the selected organ.

The other pictures correspond to different cross-sections:

- MPR1 – horizontal cross-section;
- MPR2 – vertical cross-section;
- MPR3 – diagonal cross-section;

You can manage and analyze the study images according to the criteria you need. The following buttons are used for this:

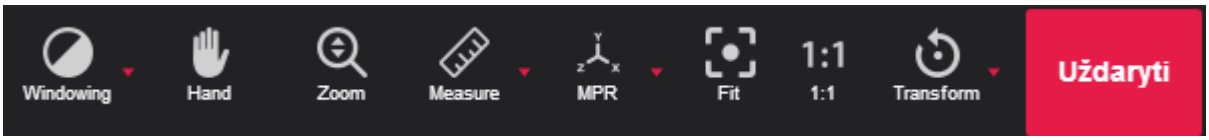
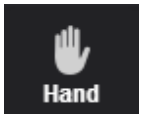
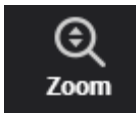


Figure 34. MPR toolbar.

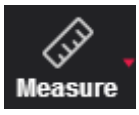
„**Default**“ button is used to adjust the Level/Window (contrast and brightness) of the image.



Hand button allows you to position images within the pane.



The button is used to increase and decrease the selected image: click on the Keyboard **+** to **Zoom In** and **–** to **Zoom Out;** click left button on your mouse and drag it upwards to zoom in and downwards to zoom out.



Measurement button allows you to measure the images in number of ways.

Slice button allows you to make a cross-section. There are two possible options:

Line – three arrows will automatically appear that make a vertical, horizontal and diagonal cross-section;

Curve - MPR calculation from the curve drawn on the original slice:

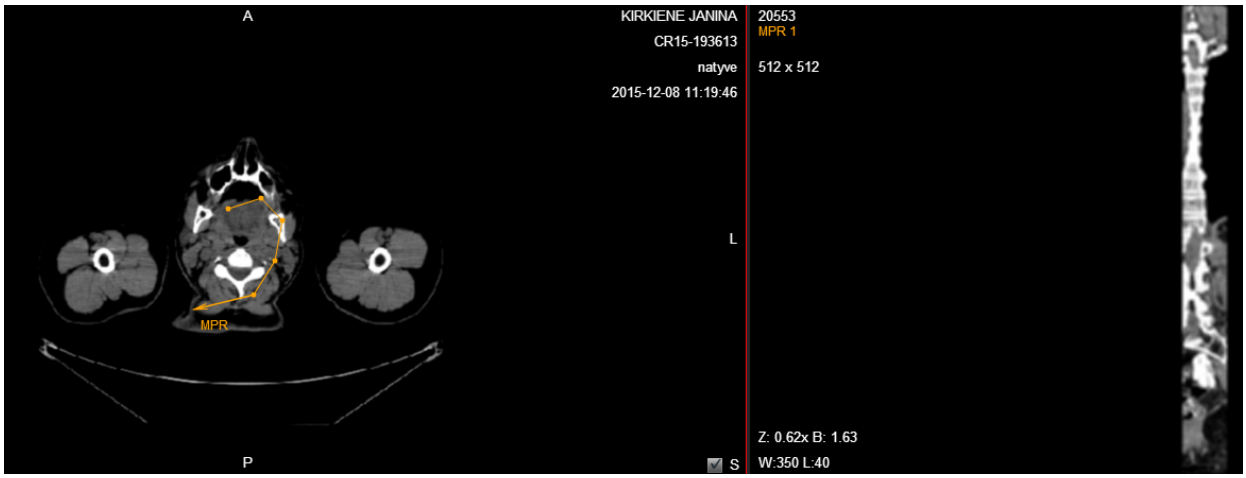
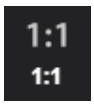


Figure 35. Curve measurement.

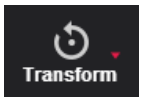
The curve is always shown in MPR1.

Delete curve – by pushing this option you will delete the curve.

Fit to Screen button**.** When you click this button, the size of the image is automatically adjusted so that the image would fill the entire screen. For example, if only part of the image is visible on the screen, choose this button to see the whole image displayed in the entire screen.

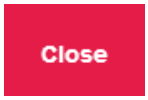


1:1 Resolution button allows you to restore the original image size.



"**Transform**" button allows you to rotate the image. Options:

- Rotate Right – to rotate the image 90° clockwise;
- Rotate Left – to rotate the image 90° counter-clockwise;
- Flip Horizontal – to flip an image 180° over the horizontal axis;
- Flip Vertical – to flip an image 180° over the vertical axis.



This button closes MPR and the main screen opens again.

Measuring Images

Measuring function is approximate and cannot be used for diagnostic purposes.

Allows you to measure the images in number of ways. The main measurement button is “**Measure**”:

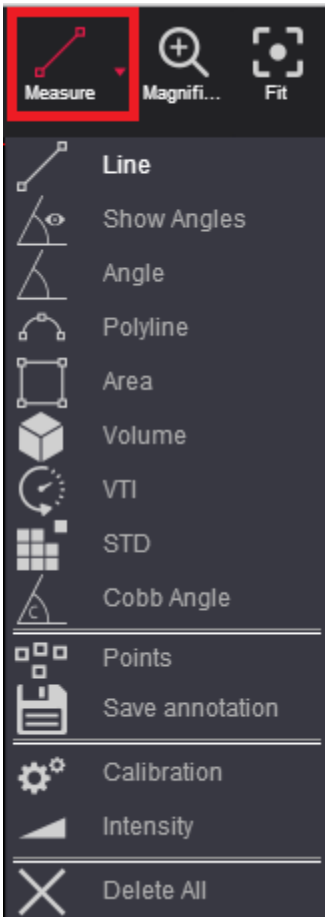


Figure 36. Measurement tools.

The “**Intensity**” button is used to measure the density of a CT image.

To measure the density:

- select “**Intensity**” once.
- move the mouse cursor over the point you want.
- the density of the point and its coordinates should be visible next to the cursor (exclicked in Hounsfield units, HU):

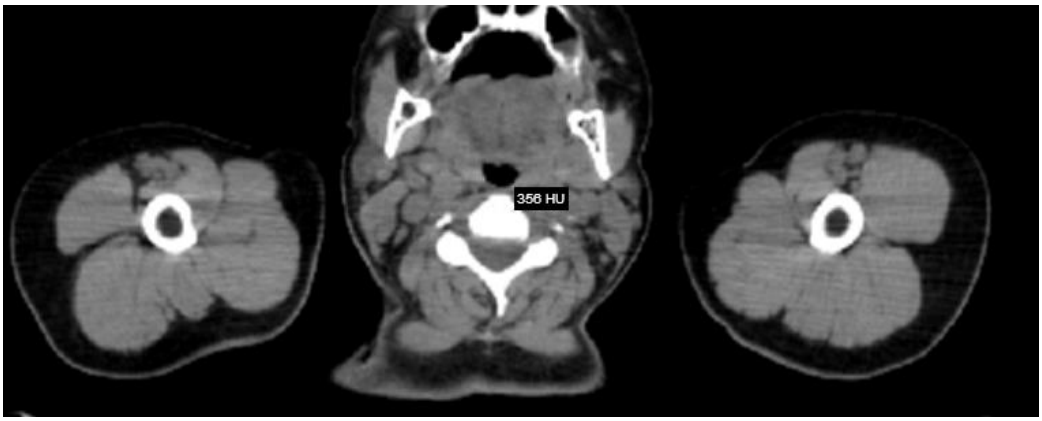


Figure 37. Intensity measurement.

To measure the distance:

- click on the „**Measure**“ button and choose „**Line**“ from the list
- place the mouse cursor on the starting point from which you want to measure the distance.
- click the left mouse button. Move the cursor to the end point and click the left mouse button once more.
- the distance (in millimeters, or pixels in some images) will be displayed in yellow:

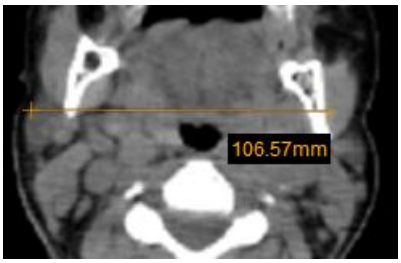


Figure 38. Line measurement.

Angle measurement.

To measure an angle:

- Position the mouse pointer on the point from which you want to measure the angle. Then click the left mouse button.
- Move the pointer to the second point (the intersection point) and click the left mouse button again.
- Then move the pointer to the end point and click the left mouse button once more.

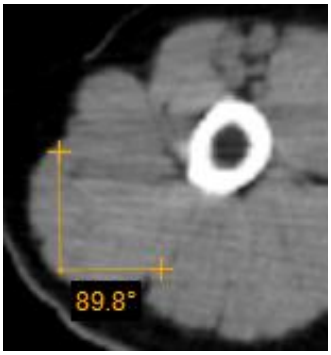


Figure 39. Angle measurement.

The **“Angle”** button is also used to measure an angle between any intersecting lines.

To display the angle measurements:

- draw intersecting lines on the image,
- on the Tools menu, click „**Measure**“ button,
- tick “**Show Angles**”:

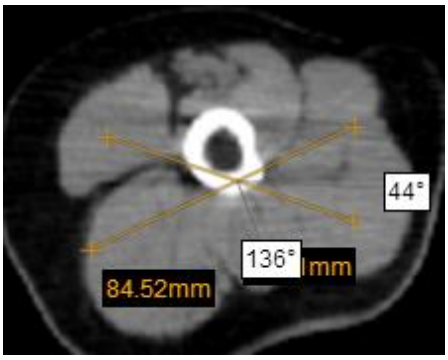


Figure 40. Angle measurement between intersecting lines.

The “**Polyline”** button is used to measure the perimeter of a region of interest.

To measure the perimeter:

- Position the mouse pointer on the point from which you want to measure the perimeter. Then click the left mouse button.
- Move the cursor to the second point (the intersection point) and click the left mouse button again.
- Then move the cursor to the third, fourth, etc. points and each time click the left mouse button again.
- Double-click once finished in order to see the result.

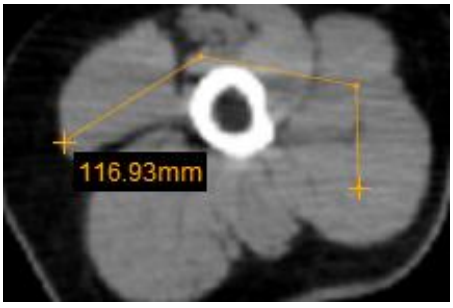


Figure 41. Polyline measurement.

The “**Area**“ button is used to measure the perimeter and the area of a region of interest.

To measure the area:

- Place the mouse cursor on the point from which you want to select the region of interest. Then click the left mouse button.
- Move the cursor to the second point (the intersection point) and click the left mouse button again.
- Then move the cursor to the third, fourth, etc. points and each time click the left mouse button again.
- When you reach the last point, click the left mouse button twice.

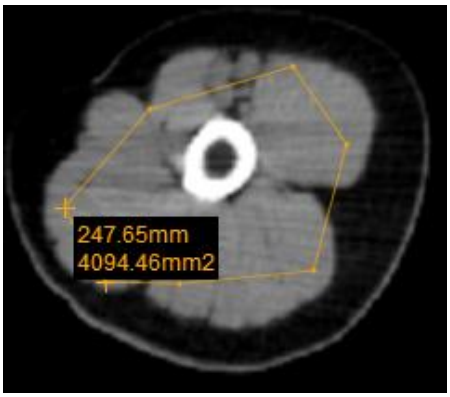


Figure 42. Area measurement.

- The area (in square millimeters) and the perimeter (in millimeters) will be displayed in yellow

The "**Volume**" button is used to measure the volume of the object.

- place the mouse cursor on the point from which you want to measure the volume.
- then click the left mouse button (do not hold it) and move the cursor to the second point and click the left mouse button again.
- then move the cursor to the third, fourth, etc. points and each time click the left mouse button again.
- when you reach the last point, click the left mouse button **twice** in order to show the height of the object.

In the illustration below, the object can be imagined as the following solid of revolution: the vertical line is the rotation axis, around which the left and the right curves are rotated half of the circle.

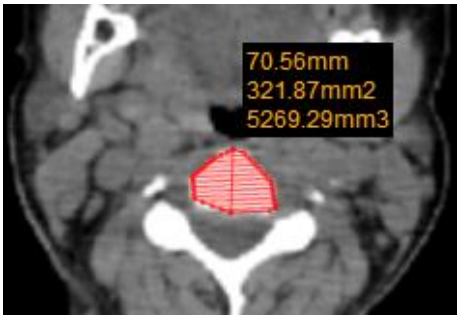


Figure 43. Volume measurement.

The "**VTI**" *(Velocity Time Integral)* button is used to measure the distance which the blood was ejected over a date interval of time.

- Place the mouse cursor on the point from which you want to measure the velocity time integral.
- Then click the left mouse button (do not hold it) and click the cursor to the second point and click the left mouse button again.
- Then move the cursor to the third, fourth, etc. points and each time click the left mouse button again.
- When you reach the last point, click the left mouse button **twice** in order to end the measurement.

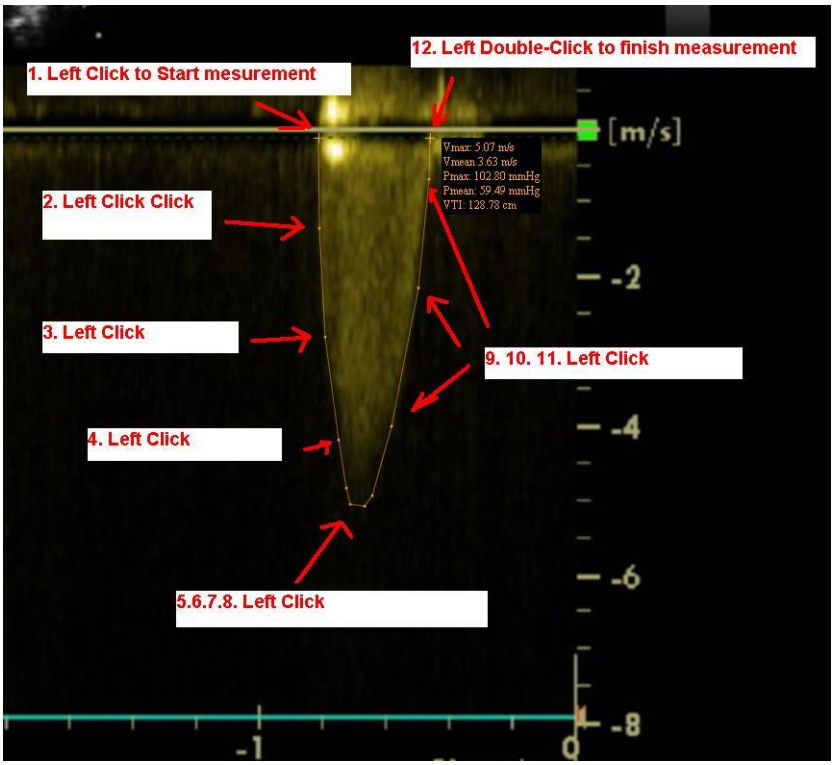


Figure 44.VTI measurement.

- The velocity time integral is measured in centimeters.

NOTE: this button is active only for the images of "US" modality.

The "**STD"** (*standard deviation*) button is used to measure average value and standard deviation of pixels in a square area of 10 by 10 mm.

- Place the mouse cursor on the place that you would like to measure STD.

Figure 45. STD measurement.

The “**Calibration”** button is used to change the scale of measurement.

- Click the Calibration button and pop-up window will appear:

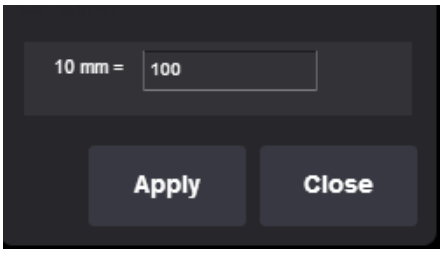


Figure 46. Calibration function.

- In this case 10mm corresponds to 100 pixels, if 0 will be left in the empty space the initial settings will be shown.

The **“Cobb angle”** button is used to measure angle between lines.

To measure angle:

- select “**Cobb angle**” measurement,
- select the image,
- click on image and lines will appear in the middle of image,
- You can drag lines, line points and move all lines simultaneously by moving the white–dotted line.

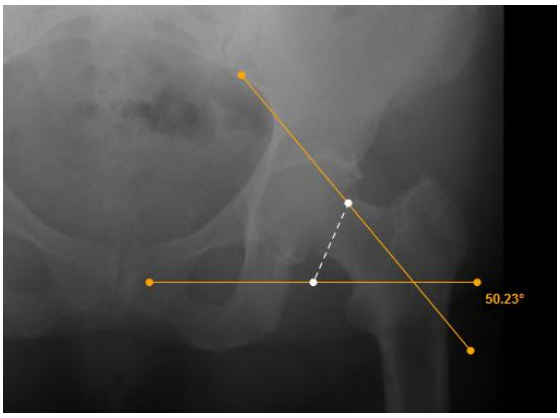


Figure 47. Cobb angle measurement.

The **“Points”** button is used to mark certain points on the image.

- Place the mouse cursor on the point where you want to make a mark. Then click the left mouse button.
- Move the mouse cursor to the next point and click the left mouse button again.
- Keep repeating this until you have the desired number of marked points.

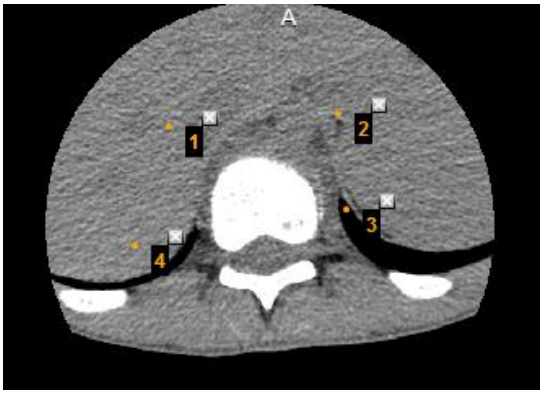


Figure 48. Points measurement.

The “**Save Annotation”** button is used to save the annotations of the measurements.

- Click the “Measure” icon and choose “Save Annotation” from the list.
- The following window will appear on the screen.

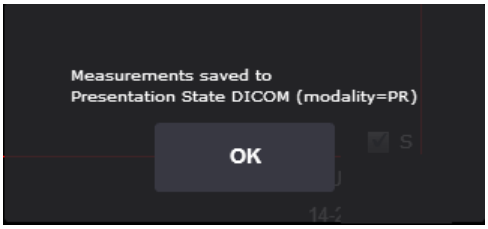


Figure 49. Save annotation.

The “**VHS**“(Vertebral Heart Scale) button is used to measure heart size and provide an accurate assessment of true cardiac enlargement. This measurement is available only with VET license.

To perform a VHS:

- select “**VHS**” measurement,
- place the mouse cursor and click the left mouse button on the point from which you want to start measuring Long Axis Point (L),
- move the cursor to the second point along the area and click the left mouse button again,
- the Long Axis Point Line will appear,
- place the mouse cursor and click the left mouse button on the point from which you want to start measuring Short Axis Point (S),
- move the cursor to the second point across the area and click the left mouse button again,
- Short Axis Point Line will appear,

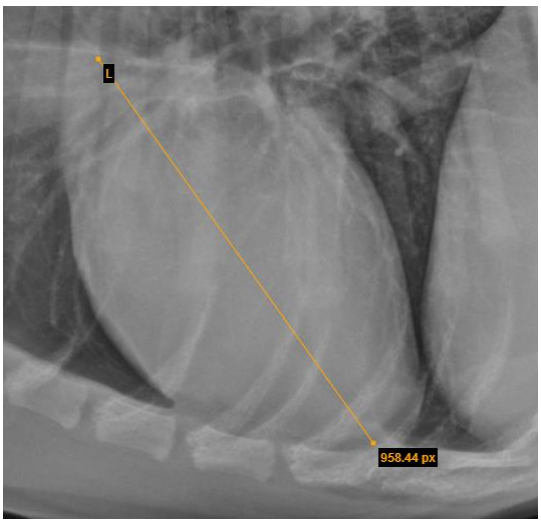


Figure 50. Long axis points.

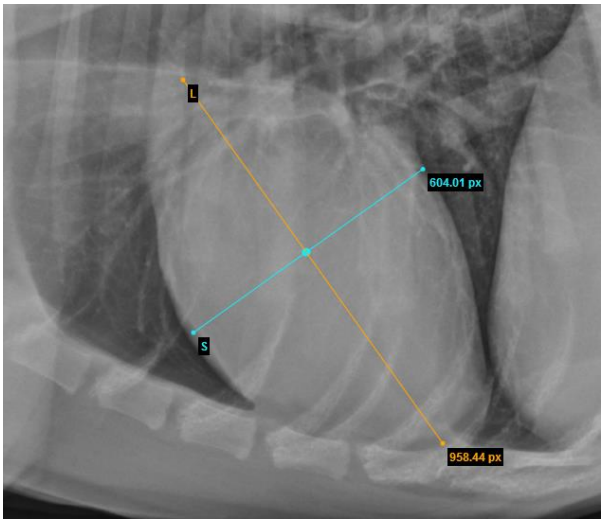


Figure 51. Short Axis points.

- In order to define SL point, place your mouse cursor and click the left mouse button on the point from which you want to measure S and L lines,
- S and L lines will appear (*Figure 51*).

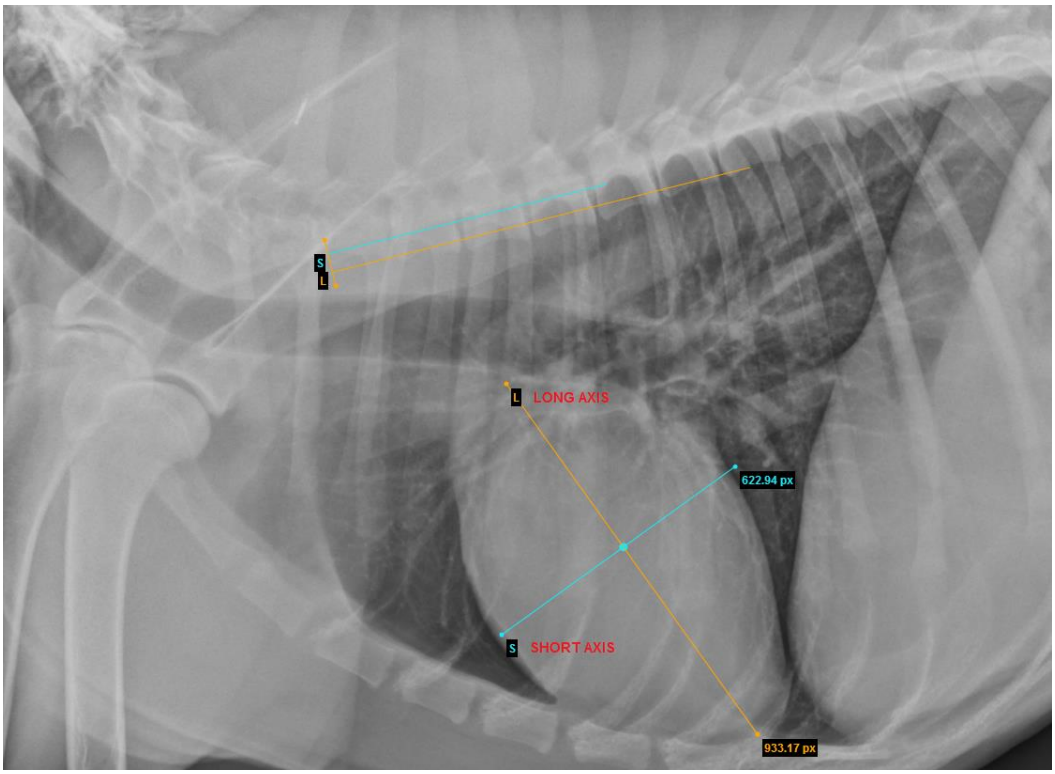


Figure 52. Demonstration of VHS measurement.

- You can rotate lines by dragging the end of the lines (dots) according to your needs. Click the left mouse button on the yellow dot (highlighted in red) and drag the line into a position where you want it to be (*Figure 53*). Middle dot (S and L line intersection point) allows to move S and L lines at the same time.

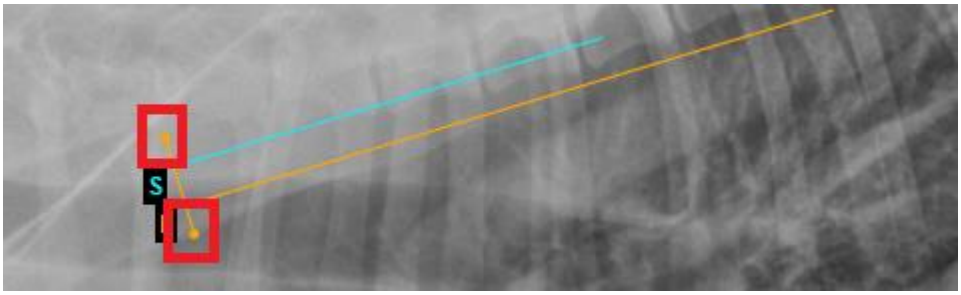


Figure 53. Rotation demonstration.

The "**Norberg Angle"** button is used to evaluate canine hips. This measurement is available only with VET license.

To measure the angle:

- Zoom in the selected image and select Norberg Angle measurement,
- Click the left mouse button over the selected image and the measurement will appear,

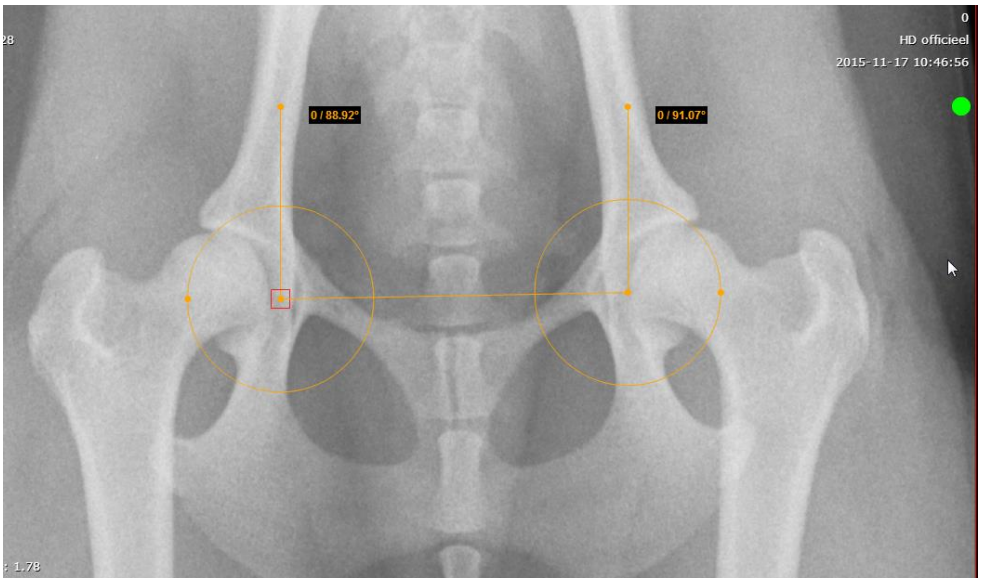


Figure 54. Norberg angle measurement.

- Move mouse cursor on the circle (or circle center) and drag to change position as you need (*Figure 54*),
- Repeat the same process with the other circle,

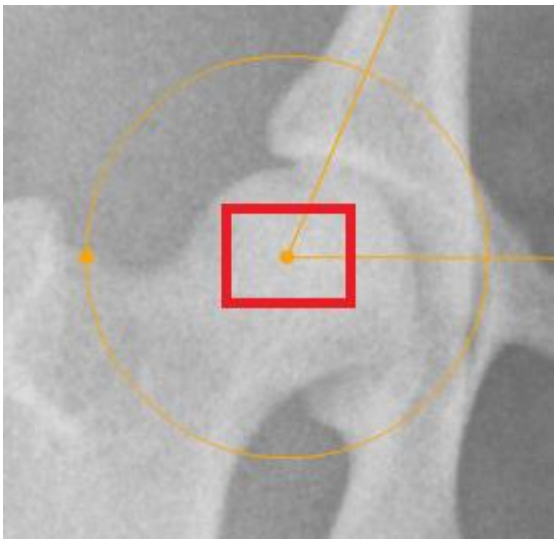


Figure 55. Center of the circle radius.

- In order to adjust the circle size – move your mouse cursor to the dot of the outer circle and drag it (*Figure 56*),

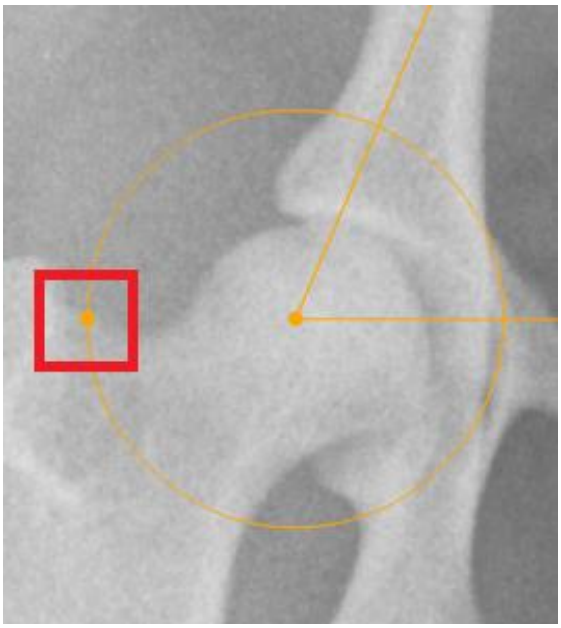


Figure 56. The outer part of the circle.

- To adjust the angles – move mouse cursor at the end of line (on the dot) and drag it,
- The angles will be calculated (*Figure 57*).

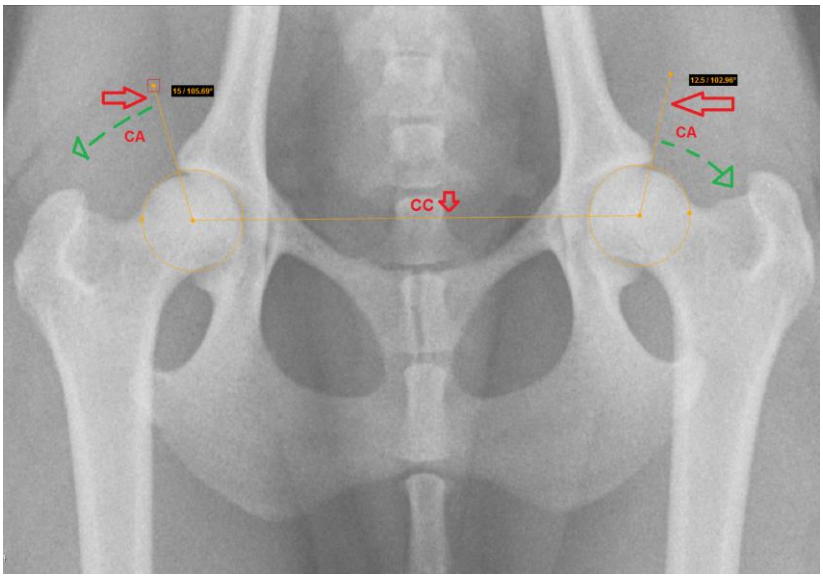


Figure 57. Demonstration of the Norberg Angle measurement.

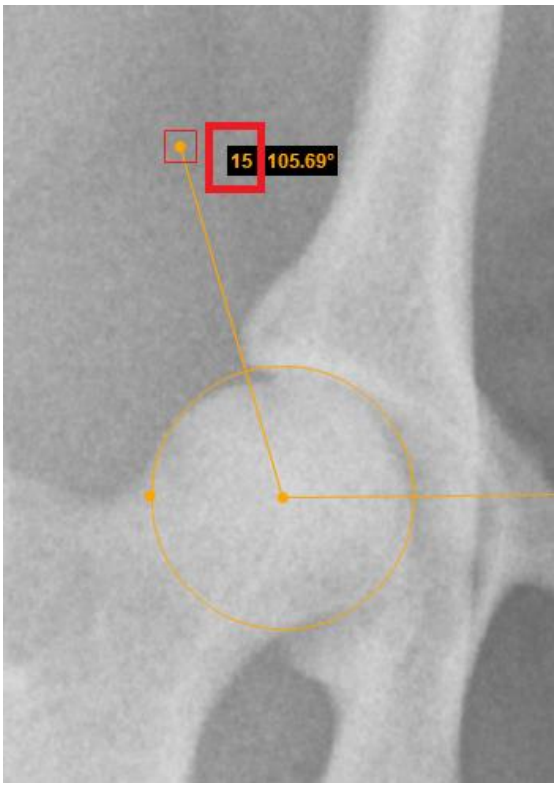


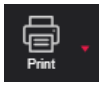
Figure 58. Norberg Angle.

The **“Delete All”** button is used to remove all measurements at once.

To remove the measurements:

- select the image from which you want to remove all measurements
- click “**Measure**”
- select **“Delete All”**

Printing images and series

To print images/series, click “Print” button, which is in the middle of the Menu bar 

(enabled for images). There are two options of printing:

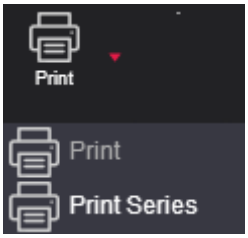


Figure 59. Printing options.

Click “Print” option to print the selected image area view.

Click “Print Series” to print whole series (images only). Then choose the number of images per page: one, two or four.

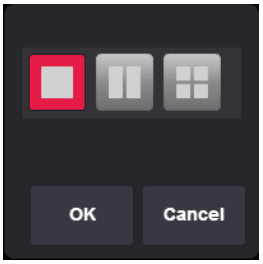


Figure 60. Selection of number of images on a page.

Saving images

Click

and select a preferred format in the pop-up menu: JPG, DICOM or TIFF. Then select to save an image, a series of images or an active study.

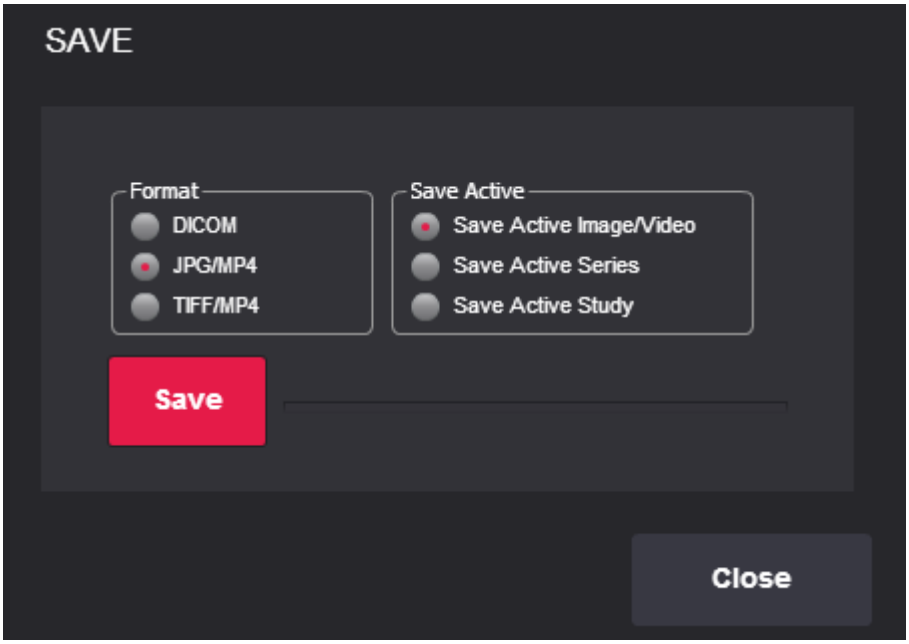


Figure 61. Saving images.

Click "**Save**" and choose a folder where you prefer to save the images in your computer. Click "Save" again.

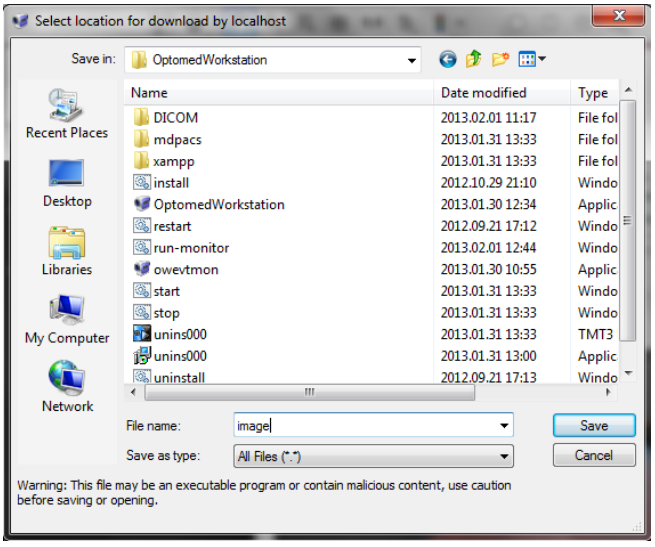


Figure 62. Saving location selection.

Click

in order to close the window.

Export and forward study

The button “**Forward**” is used to send the selected study to the remote device, while the button “**Burn**” will save the study to a CD.

To forward the study:

- open the study you would like to send and click “**Forward**”

- the forwarding window appears:

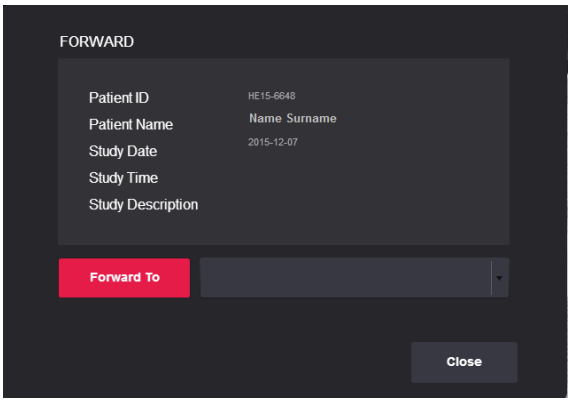


Figure 63. Study forwarding.

- choose a device from the list;
- click “Forward To”.

To export the study (to save it on a CD):

- select the study that you want to write on the CD or DVD and click “**Burn**”:

- the export window appears.
- choose CD, DVD or Unlimited.

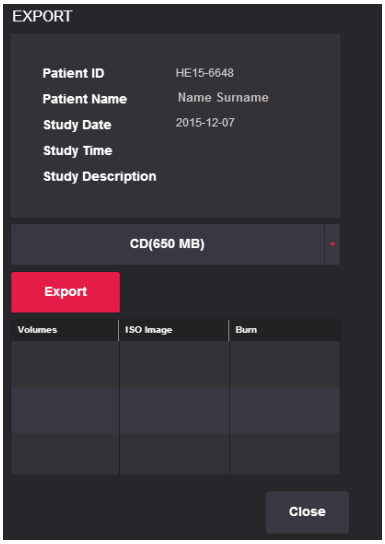


Figure 64. CD burning.

- Click the button “Export” in Export Menu. After a while, two additional buttons will appear in the list below

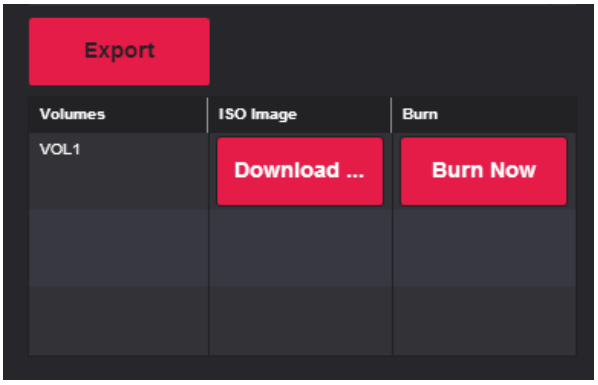


Figure 65. Export menu.

- You can choose one of two options in this window:

1. „Download ISO“ - this option is used to download a CD image which can be burned to the disc later;

2. „Burn Now“ - this option is used to write the file to a CD automatically. (You will need to install additional software, MedDreamBurn and Active ISO Burner, on each workplace.)

CAUTION

*MedDream is incompatible with the CD Viewer from Softneta ("DICOMDIR Viewer"). Both Viewer and MedDream may encounter licensing errors if CD Viewer runs **on the same computer** where MedDream is hosted. Use a different machine to test the Viewer on a burned CD or temporally shut down the webserver that hosts MedDream.*

MedDream DICOM Viewer Mobile Version

Logging on to MedDream Mobile

To log on to MedDream Mobile version, please do the following:

- Enter the address given by your administrator in your Internet Browser. The following screen will appear:

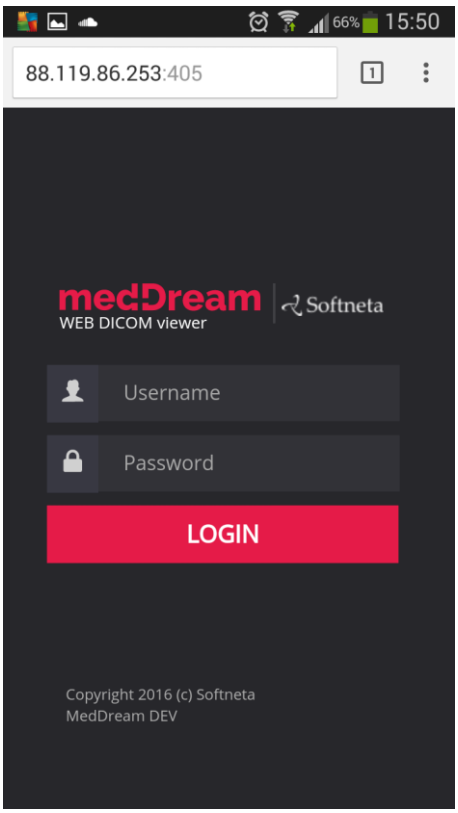


Figure 66. Logging in.

- Enter the username you were given in the field "**Username**"
- Enter the password in the field "**Password**". If you forgot your password, please contact your system administrator.
- Tap **login** on the screen.

Search of studies on Mobile Version

Search menu will help you to quickly find the studies you need. We recommend using all possible search menu options in order to get the most accurate search results and save your time.

To find a study, please follow these steps:

1. Once you login in to Mobile version "**Search**" window appears on the screen.

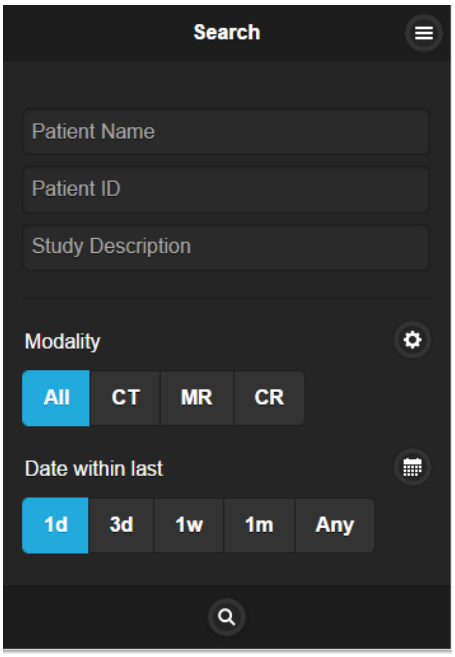


Figure 67. Search window

2. Enter **search criteria** (Patient ID, Patient Name and Study Description).

3. To specialize the search further, please select **the date interval** when the study could have be done. This can be done using **two different date interval search criteria**.

→To select the study date you can choose from the super quick pick list "**Date within last**" accordingly to the date interval you need your studies to be from: "**1d"** (current day), "**3d"** (3 days interval), "**1w"** (1 week interval), "**1m"** (1 month interval) or "**Any"** (no specific date).

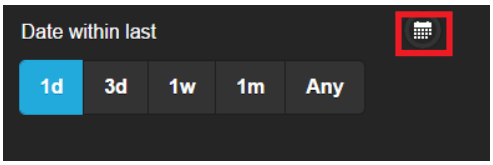


Figure 68. Search according to dates.

→To specify the study date date interval tap the icon marked in red (*Figure 69*) and the following window will show up:

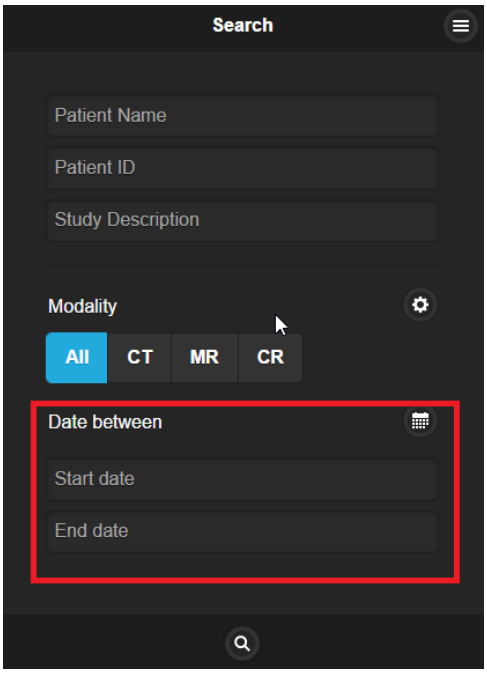


Figure 69. Date search options

4. The search can also be specified by selecting the method which was used to obtain the study images (modalities):

→ CR, CT, DX, ECG, ES, IO, MG, MR, NM, OT, PX, RF, RG, SC, US, XA, XC, All. The system allows to select a few image modalities. Tap the icon marked in red (*Figure 70*).

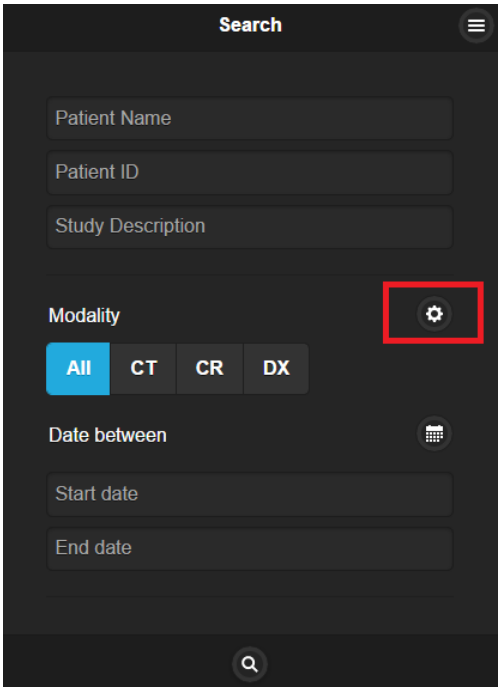


Figure 70. Search according to modalities.

Now you can add all possible methods by tapping on the modality you want to be added to the search (*Figure 71*).

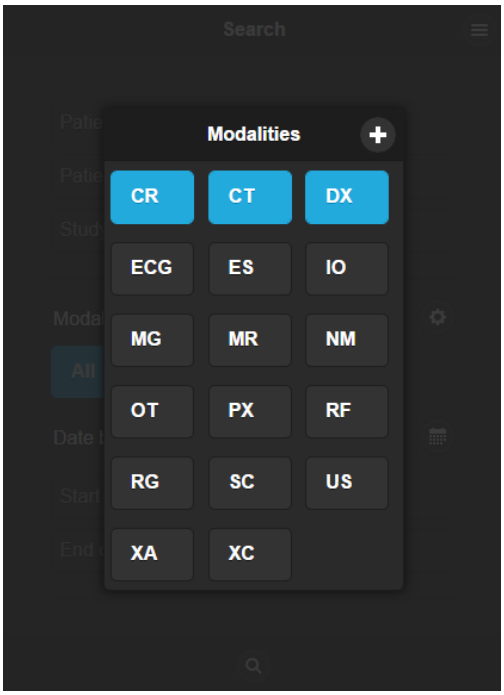


Figure 71. Modalities search

* Abbreviations:

CR – *Computed Radiography*

CT – *Computed Tomography*

DX – *Digital Radiography*

ES – *Endoscopy*

IO – *Ultra-Oral Radiography*

MG – *Mammography*

MR – *Magnetic Resonance*

NM – *Nuclear Medicine*

OT – *Other*

PX – *Panoramic X-Ray*

RF – *Radio Fluoroscopy*

RG – *Radiographic Imaging*

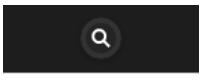
SC – *Secondary Capture*

US – *Ultra Sound*

XA – *X-Ray Angiography*

XC – *External camera photography*

ECG - *Electrocardiography*

5. After you have selected your search criteria, start the search by tapping "**Search**" icon 

6. You will see the following window with the search results.

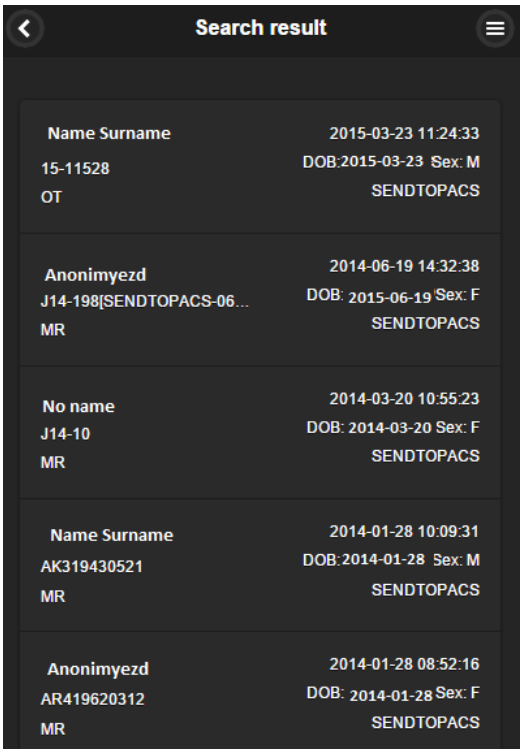


Figure 72. Search results.

7. Tap on the specific study so you could see the image you want to analyze (*Figure 73*).

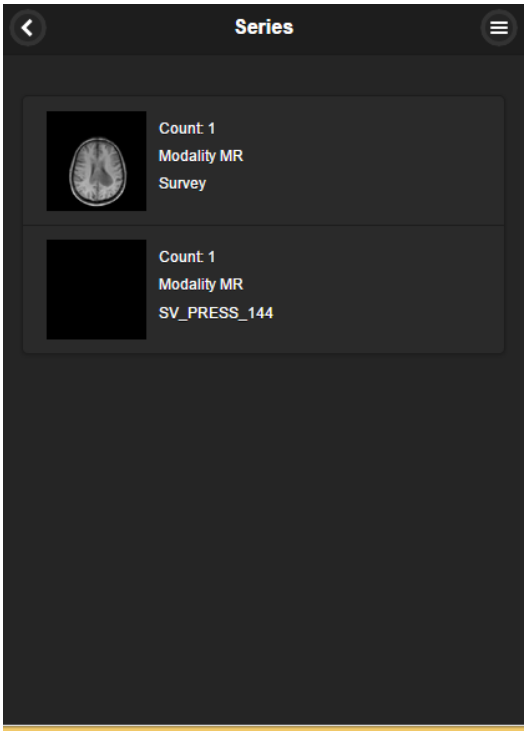


Figure 73. Select image

Manipulating images on Mobile Version

You can manage and analyze the study images according to the criteria you need. Image manipulation tool bar is marked in red below (*Figure 74*):

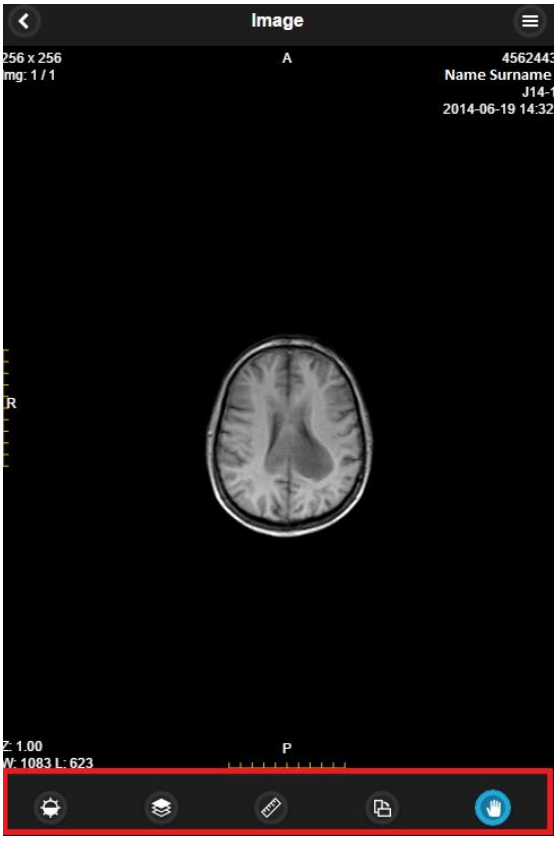


Figure 74. Image manipulation tools.

More about each of them:

Button is used to adjust the Level/Window (contrast and brightness) of the image. Put your finger on the screen and pan up and down to control the brightness of the image.

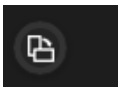
Button functions as a scroll bar. Once tapped it enables you to scroll through the series of images by dragging the image sideways.

If you want to zoom in or zoom out you just need to pinch and stretch. It zooms gradually an image out or in.

“**Hand**” button allows you to position images within the pane. This feature is especially useful when the image is larger than the pane, as it usually is after zooming.

To move an image within the screen:

- On the Tools menu, tap “**Hand**”
- Tap the image you want to move and flick the image around the screen to drag it to the position needed.
- Release the image to leave it in its new position.


“**Transform**” button allows you to rotate the image. Tap the button and select one of the options from the pop-up menu. Tap the “X” button to exit the pop-up window.

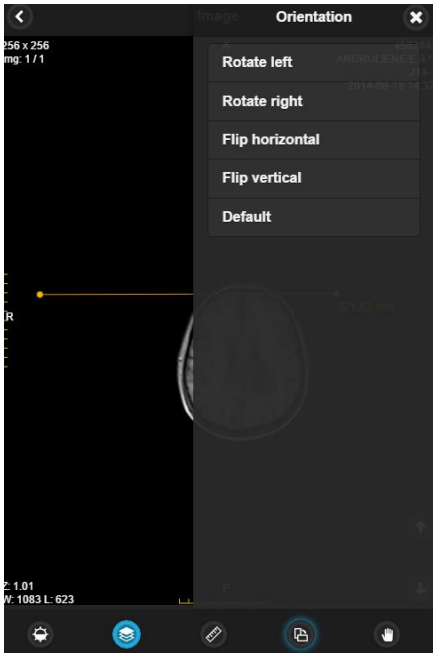


Figure 75. Transformation possibilities.

- Rotate Right – to rotate the image 90° clockwise;
- Rotate Left – to rotate the image 90° counter-clockwise;
- Flip Horizontal – to flip an image 180° about the horizontal axis;
- Flip Vertical – to flip an image 180° about the vertical axis.
- Default – revert to preselected automatic option.

Measuring Images on Mobile Version

Measuring function is approximate and cannot be used for diagnostic purposes.

Allows to measure the images in number of ways. Once tapped it calls out measurement tool menu (marked in red). Tap the button and select one of the options from the pop-up menu. Tap the “X” button to exit the pop-up window.

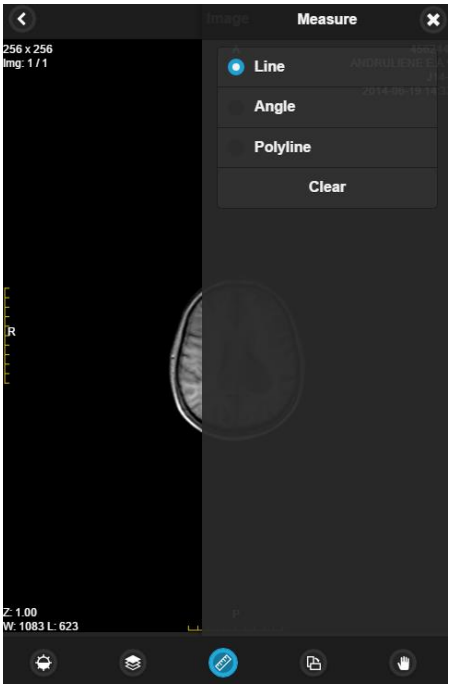


Figure 76. Measurement tools.

- Line – to measure the distance;
- Angle – allows you to display the angles;
- Polyline - to measure the perimeter of more than one line;
- Clear – deletes all measurements you have made so far.

- Tap on the measure button “**Line**“ from the list;
- Tap on the starting point from which you want to measure the distance;
- Tap on the ending point where you want to end measuring the distance;
- The distance (in millimeters, or pixels in some images) will be displayed in yellow:

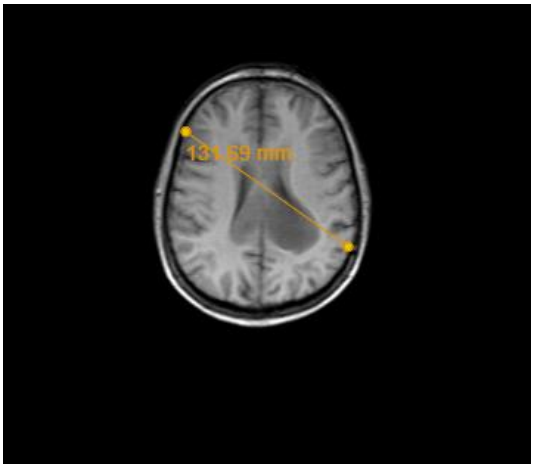
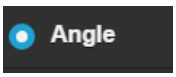
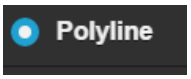


Figure 77. Line measurement.



- Tap on the measure button “**Angle**“ from the list;
- Draw intersecting lines on the image;
- Tap on the starting point where you want to start one of your lines and tap on the end of each line where you want to end your measuring;
- The result will be displayed in yellow:

Figure 78. Angle measurement.



- Tap on the measure button “Polyline“ from the list;
- Tap on the point where you want to start measuring your perimeter and move along;
- Then tap to the second, third, fourth, etc. points till you reach the last point – use double-click in order to see the result;
- The perimeter (in millimeters, or pixels in some images) will be displayed in yellow:

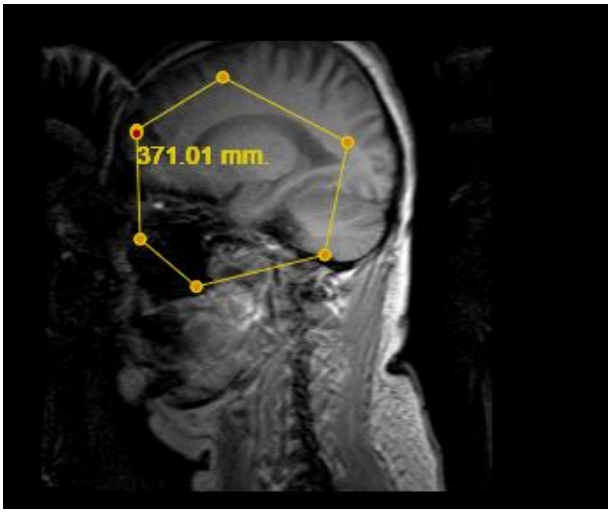


Figure 79. Polyline measurement.

To remove the measurements:

- select the image from which you want to remove all measurements
- click “**Measure**” buton
- select **“Clear”** from the pop-up window.

System menu functions on Mobile Version

You can open a system menu with functions “User settings”, “About”, “Search” and “Log out” by tapping on the right top corner icon marked in red and choose functions from the pop-up window (*Figure 80*):

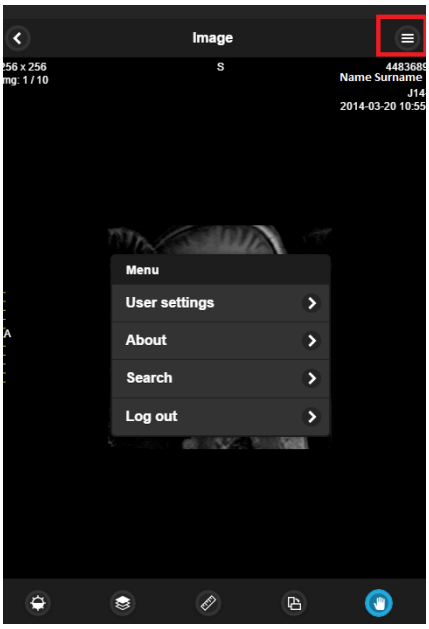


Figure 80. System menu.

Allows you to choose **view mode** (8 or 16 bit):

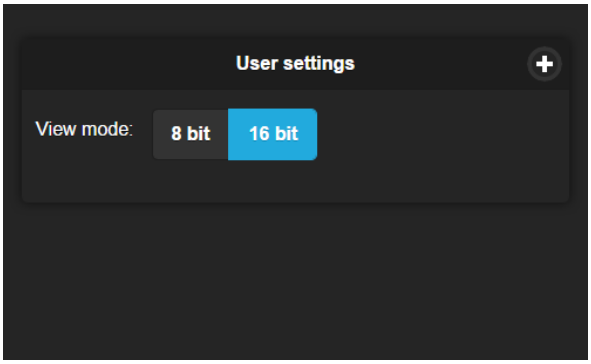


Figure 81. View mode.

Information window will display with the following information.

Information window will display:

1. Full product name;
2. Version;
3. Build date;
4. Medical device class;
5. License to;

6. Concurrent connections;
7. Modules;
8. Valid to – empty if there is no termination in time;
9. Update to – date till the technical support and updates are provided;
10. Contacts – Softneta UAB contacts.

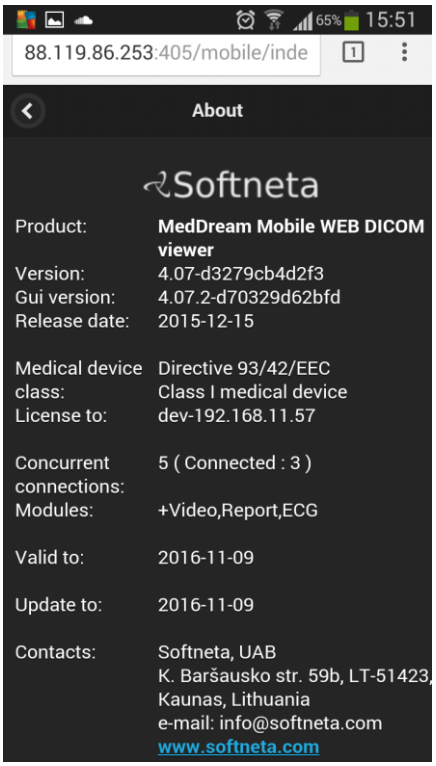


Figure 82. Information window.

Forwards you to the search window.

Log out when access is no longer needed.

Button on the left top corner enables you to return to the previous page or screen.

MedDream DICOM Viewer on HTML5 platform

Logging on to MedDream HTML5 platform

To log on to MedDream, please do the following:

- Enter the address given by your administrator in your Internet Browser. The following screen will appear:

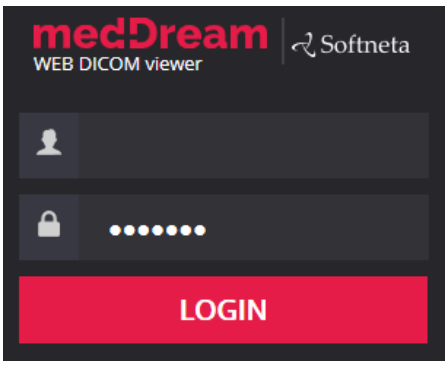


Figure 83. Logging in.

- Enter the username you were given in the field "**Username**"
- Enter the password in the field "**Password**". If you forgot your password, please contact your system administrator.

Search of studies on HTML5 platform

Search menu will help you to quickly find the studies you need. We recommend using all possible search menu options in order to get the most accurate search results and save your time.

To find a study, please follow these steps:

1. Once you login such window appears on the screen.

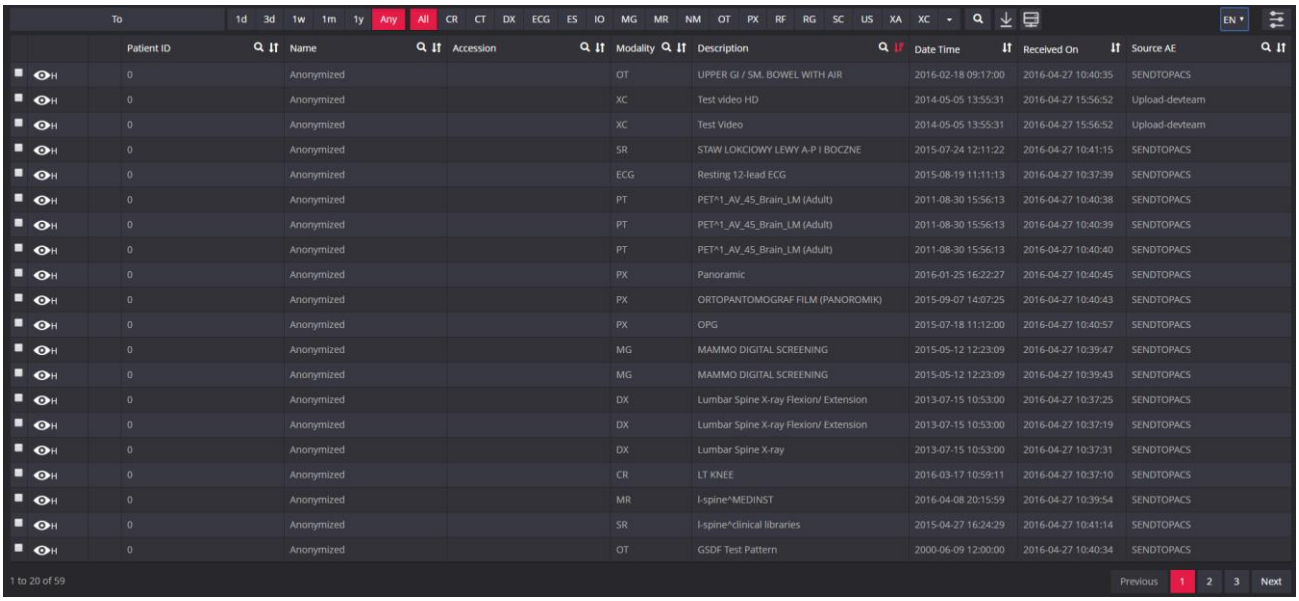


Figure 84. "Search" window

2. Enter **search criteria** (Patient ID, Patient Name, Accession Number and Study Description). Type the information in according fields.

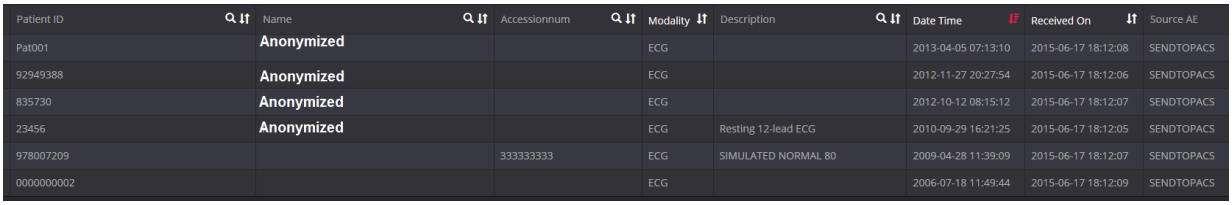


Figure 85. Search filters.

The criteria are as following:

- **“Patient ID”** - enter patient's ID number in the search field
- **“Patient Name” -** enter the patient's name or surname in the search field

☞ It is not possible to search for Ideographic and Phonetic versions of patient names. The search is performed only against the basic version (Alphabetic), even if the image contains the other two versions and the PACS supports them.

- **“Accession Number”** – enter the number of accession
- **“Description”** - enter few keywords from the study description
- **“Source AE”** – application entity.

Each of the field has button. You can arrange each of them in ascending or descending order. Click once and the order of the selected field will change from ascending to descending and vice versa.

- Ascending – arranged from smallest to largest (increasing);
- Descending – arranged from largest to smallest (decreasing).

3. To specialize the search, please select **the date interval** when the study could have be done. This can be done using **two different date interval search criteria**.

→To select the study date you can choose from the super quick pick list (*Figure 86*) accordingly to the date you need your studies to be from: "**1d"** (current day), "**3d"** (3 days interval), "**1w"** (1 week interval), "**1m"** (1 month interval), "**1y**" (1 year) or "**Any"** (no specific date interval)

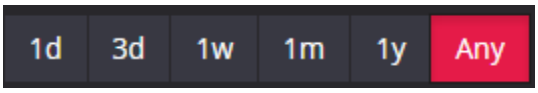


Figure 86. Search according to dates.

→ To specify the study dates click on left top corner and choose the date interval from the pop-up window (*Figure 87*).

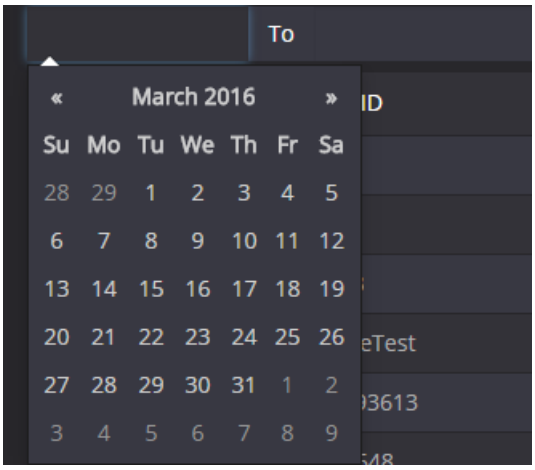


Figure 87. Date search options.

4. The search can also be specified by selecting the method which was used to obtain the study images (modalities):

- Tick the field next to one or more methods (devices) that were used in the required study (please look below for the meaning of the abbreviations)

→ CR, CT, DX, ECG, ES, IO, MG, MR, NM, OT, PX, RF, RG, SC, US, XA, XC, All. The system allows to select a few image modalities. Click the icon marked in red (*Figure 88*) and now you can add all possible methods by clicking on the modality you want to be added to the search.

Figure 88. Search according to modalities.

If you are searching for some rare modality that has no corresponding button here, try to enter its abbreviation directly into the name of "Modality" column (Fig. 85).

Moreover, you can select all possible methods by clicking the “All” button:

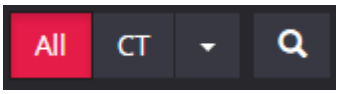


Figure 89. Modalities search: All.

Abbreviations:

CR – *Computed Radiography*

CT – *Computed Tomography*

DX – *Digital Radiography*

ES – *Endoscopy*

IO – *Ultra-Oral Radiography*

MG – *Mammography*

MR – *Magnetic Resonance*

NM – *Nuclear Medicine*

OT – *Other*

PX – *Panoramic X-Ray*

RF – *Radio Fluoroscopy*

RG – *Radiographic Imaging*

SC – *Secondary Capture*

US – *Ultra Sound*

XA – *X-Ray Angiography*

XC – *External camera photography*

ECG - *Electrocardiography*

5. After you have selected your search criteria, start the search by clicking “**Search**” icon

6. Click on

icon so you could see the image you want to analyze the image on HTML platform (*Figure 90*) and a new browser tab will pop up (marked in red).

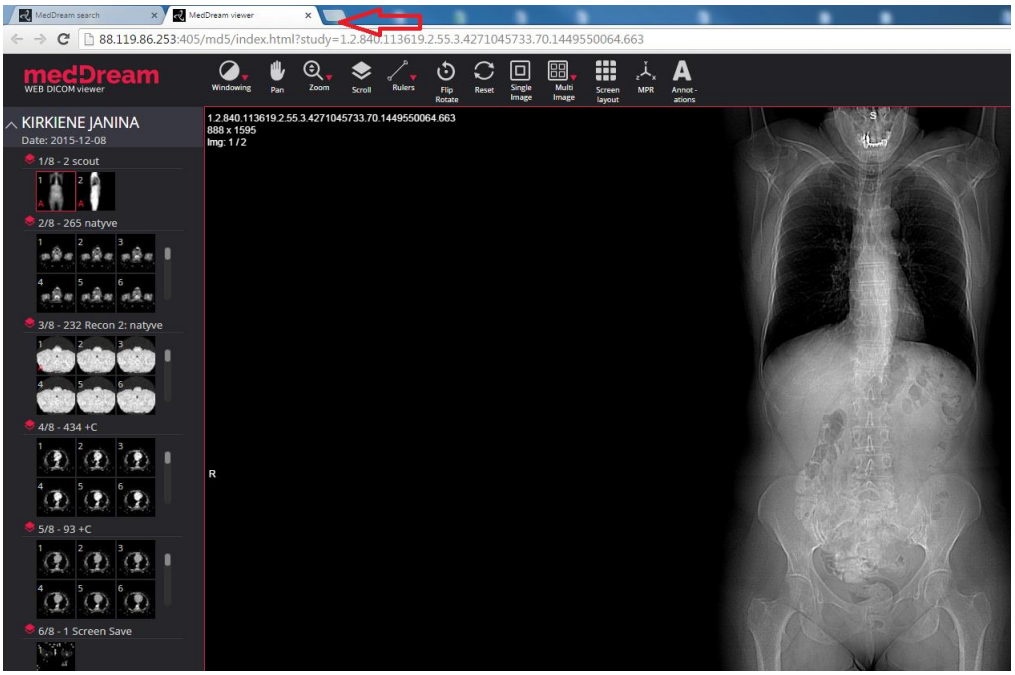


Figure 90. Search results onHTML5 platform.

7. To view the image move the mouse cursor on the small image on the left, click the left mouse button and drag the image to the field on the right. Now you should be able to view your image.

Manipulating and analyzing images on HTML5 platform

You can manage and analyze the study images according to the criteria you need:

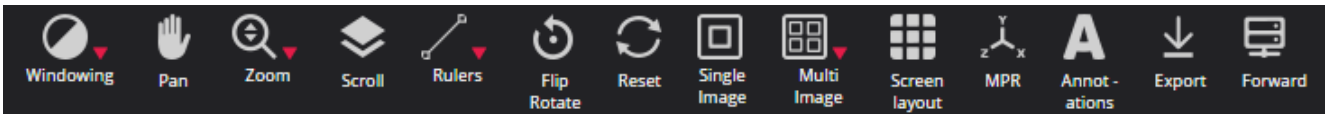
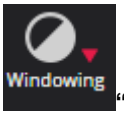


Figure 91. Image manipulation tools.

More about each of them:



"Windowing" button is used to adjust the Level/Window (contrast and brightness) of the image. Put your finger on the screen and pan up and down to control the brightness of the image. A pop-up window appears:

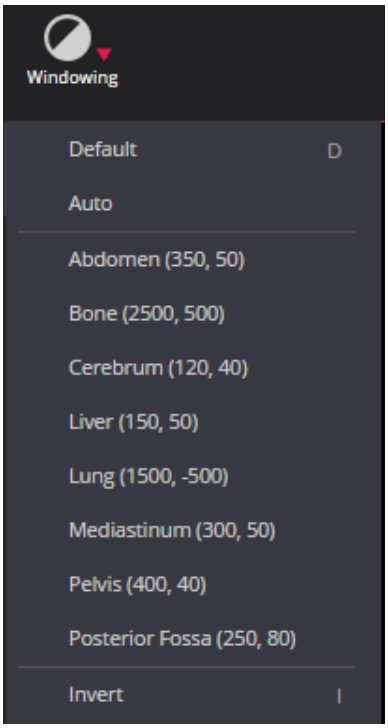
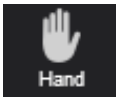


Figure 92. Level/Window button options.

You can select one of the standard contrast settings:

Default *– a preset setting with values from the image itself (if available).*
Auto *– the system analyses the image and adjusts the brightness and contrast automatically.*
Abdomen *– a preset setting for abdomen studies.*
Bone *– a preset setting for bone studies.*
Cerebrum *– a preset setting for cerebrum studies.*
Liver *- a preset setting for the liver studies.*
Lung *– a preset setting used for studying the images of the lungs.*
Mediastinum *- a preset setting for mediastinum studies.*
Pelvis *– a preset setting for pelvis studies.*
Posterior Fossa *- a preset setting for Posterior Fossa studies.*
Inverse *– the user can inverse the image.*



"**Hand**" button allows you to position images within the pane. This feature is especially useful when the image is larger than the pane, as it usually is after zooming in.

To move an image within the pane:

- On the Tools menu, click "**Hand**" icon
- Position the cursor over the image you want to move and click-and-drag the cursor around the pane to move the image.
- Release the mouse button to leave the image in its new position.

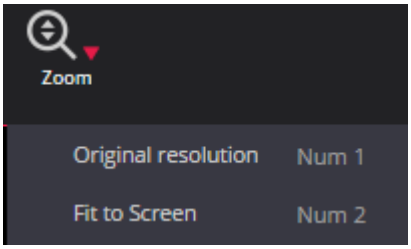
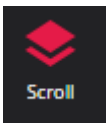


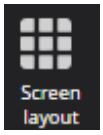
Figure 93. Resolution button options.

Resolution button is used to **"Fit to Screen"** or **"Original resolution"** button**.**

- When you click **"Fit to Screen"** button, the size of the image is automatically adjusted so that the image would fill the entire screen. For example, if only part of the image is visible on the screen, choose this button to see the whole image displayed on the entire screen.
- When you click **"Original resolution"** button, the size of the image changes into original size.



Button functions as scroll bar. Once tapped it enables you to scroll through the series of images.



Button divides the screen into sections and allows you to drag as many images as you want to the right side of the screen. It helps in comparing images (*Figure 94*).

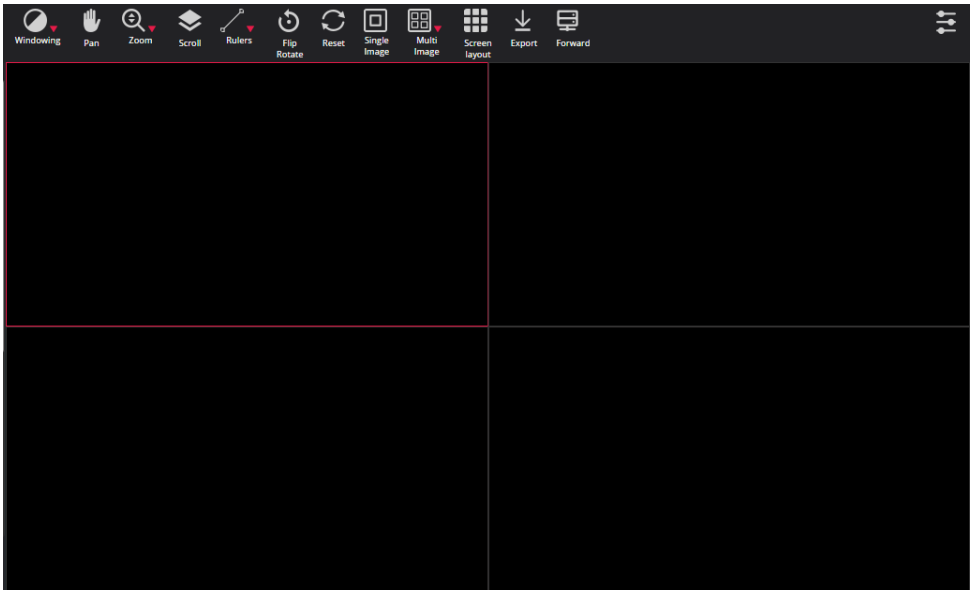
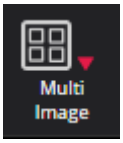


Figure 94. Comparison possibilities.



Button divides the selected section into several subsections. Once you have selected this button drag the studies to the field. The study and all the following images that you want will appear on the selected field.

Note! All the image manipulation functions affect the entire set of images opened in a multiple viewports mode (such as “Scroll”, “Brightness/Contrast”, “Rotate”, “Pan”, “Reset”). For example, if you select “Bone” contrast mode it will apply the “Bone” mode to all images that are viewed through the multiple viewports mode though the changes does not apply to the image which is not viewed via multiple viewports. (see Figure 95).

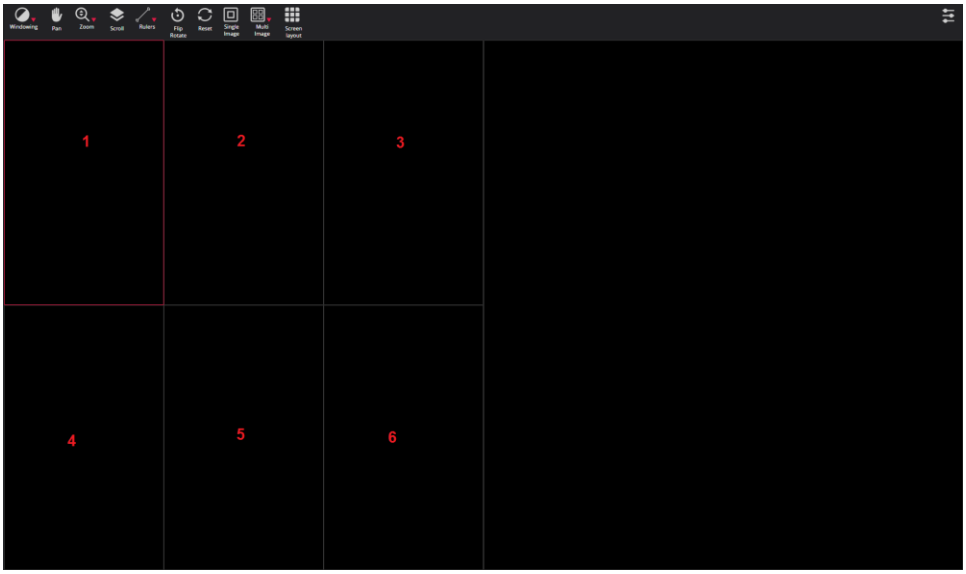
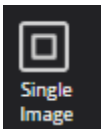


Figure 95. Multiple viewports.



Button returns the selected section to the default stage with single image on the selected screen.

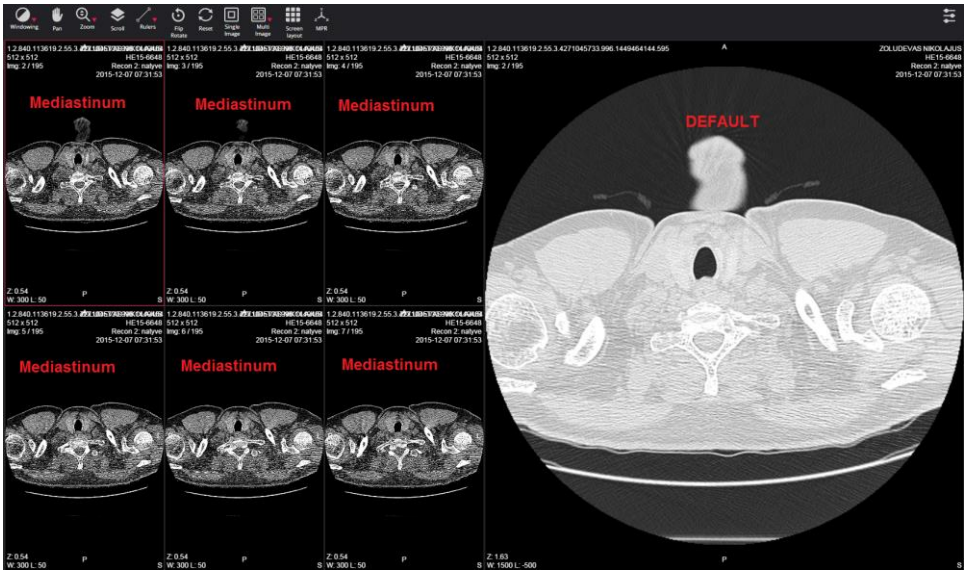
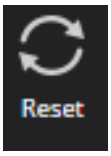


Figure 96. Multiple viewports (Mediastinum view mode).



“Reset” button is used to reset and clear any data that you have been working on.

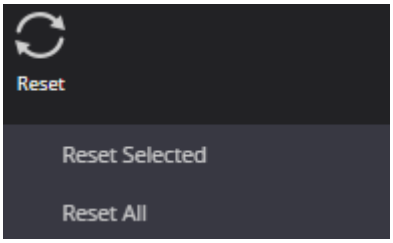
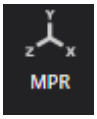


Figure 97. Reset selection.



Selecting the **MPR** view is done by clicking the MPR button in the views panel. It contains three different panels:

- Axial
- Sagittal
- Coronal
- Oblique

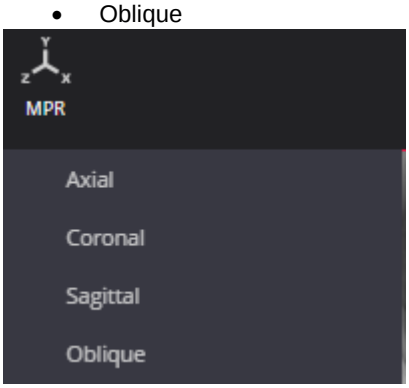


Figure 98. MPR selection.

Once you have clicked on one of the options, the pop-up window will appear. There you have to fill two input boxes:

- Start Frame: – number of the first frame of selected series;
- End Frame – number of the last frame of selected series.

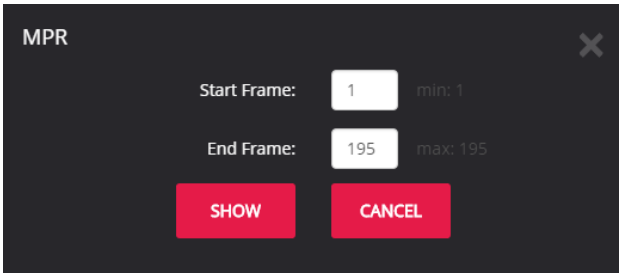
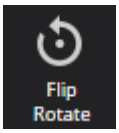


Figure 99. MPR frame selection.

User can input the range from which MPR will be calculated. After you enter the frame range, click “**Show**” and the loading will start.

Figure 100. MPR download process.

Once the loading process is done, you will be able to scroll the mouse wheel up and down over the image and see the view (axial, sagittal, coronal) you have selected.



"**Transform**" button allows you to rotate the image. Tap the button and select one of the options from the pop-up menu. Tap the "X" button to exit the pop-up window.

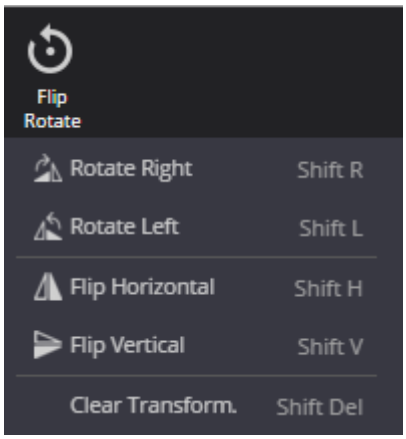
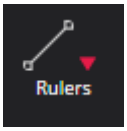


Figure 101. Transformation possibilities.

- Rotate Right – to rotate the image 90° clockwise;
- Rotate Left – to rotate the image 90° counter-clockwise;
- Flip Horizontal – to flip an image 180° about the horizontal axis;
- Flip Vertical – to flip an image 180° about the vertical axis.
- Clear transformation – revert to preselected automatic option.

Measuring images on HTML5 platform

Measuring function is approximate and cannot be used for diagnostic purposes.



Button allows you to measure the images in number of ways. The main measurement button is “**Rulers**”:

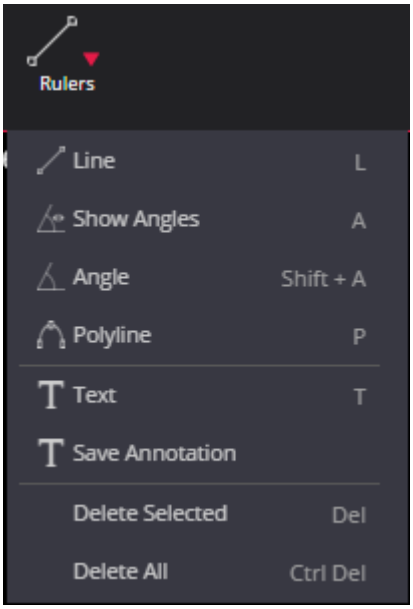


Figure 102. Measurement tools.

To measure the distance:

- click on the „**Rulers**“ button and choose „**Line**“ from the list
- place the mouse cursor on the starting point from which you want to measure the distance.
- click the left mouse button. Move the cursor to the end point and click the left mouse button once more.
- the distance (in millimeters, or pixels in some images) will be displayed in yellow:

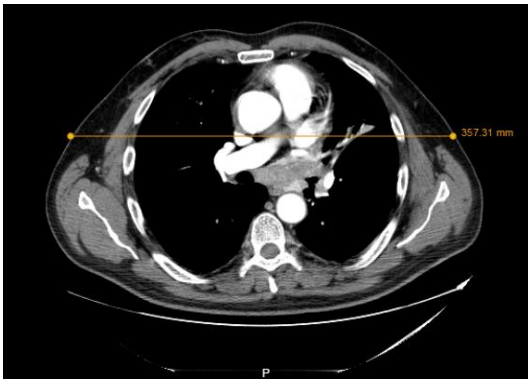


Figure 103. Line measurement.

Angle measurement.

To measure an angle:

- Position the mouse pointer on the point from which you want to measure the angle. Then click the left mouse button.
- Move the pointer to the second point (the intersection point) and click the left mouse button again.
- Then move the pointer to the end point and click the left mouse button once more.

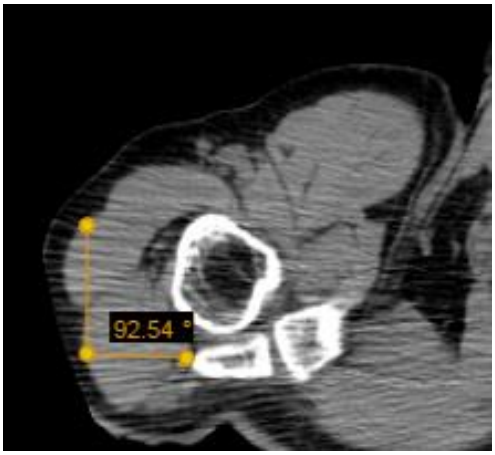


Figure 104. Angle measurement.

The **"Angle"** button is also used to measure an angle between any intersecting lines.

To display the angle measurements:

- draw intersecting lines on the image,
- on the Tools menu, click „**Rulers**" button,
- tick "**Show Angles**":

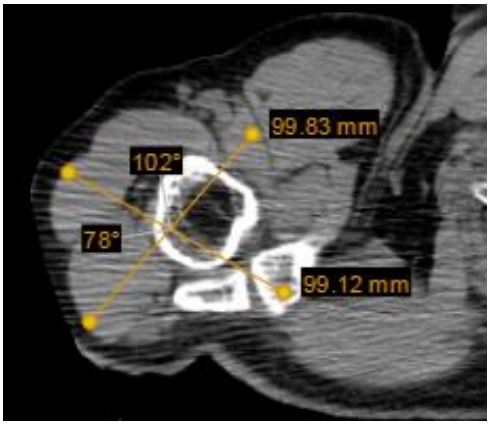


Figure 105. Angle measurement between intersecting lines.

The "**Polyline"** button is used to measure the perimeter of a region of interest.

To measure the perimeter:

- Position the mouse pointer on the point from which you want to measure the perimeter. Then click the left mouse button.
- Move the cursor to the second point (the intersection point) and click the left mouse button again.
- Then move the cursor to the third, fourth, etc. points and each time click the left mouse button again.

- Double-click once finished in order to see the result.

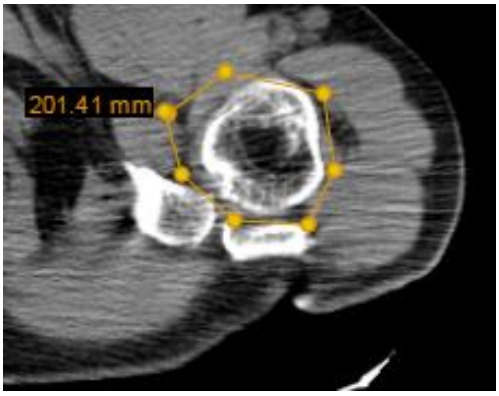


Figure 106. Polyline measurement.

The **“Delete All”** button is used to remove all measurements at once.

To remove the measurements:

- select the image from which you want to remove all measurements
- click “**Rulers**”
- select **“Delete All”.**

The **“Delete Selected”** button is used to remove selected measurements at once.

To remove the selected measurements:

- select the image from which you want to remove selected measurements
- click “**Rulers**”
- select **“Delete Selected”.**

Saving Annotations on HTML5 platform

Annotations can be written, viewed and saved.

! Note: *This function is fully handled only on HTML5 platform. Flash platform only allows you to see whether there is an annotation made or not. If the letter "A" stands next to the study image on the left corner of the thumbnail it means there has been an annotation made and it can be fully handled (viewed, saved and edited) on HTML5 platform.*

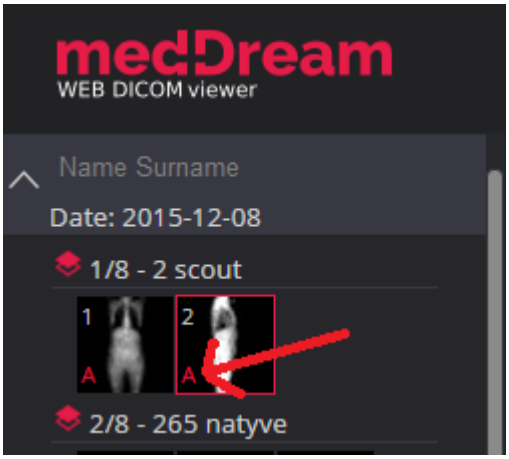


Figure 107. Annotation mark.

To **write annotation**:

- once you have made any of the measurements or manipulations of the study image, you will be able to write an annotation.
- move your mouse cursor to the upper toolbar and select icon "Rulers".
- click on the icon "Rulers", then select **"Text"** from the list.
- select the point where you want to write an annotation text.
- click the left mouse button on the point you have selected.
- annotation text window will appear:

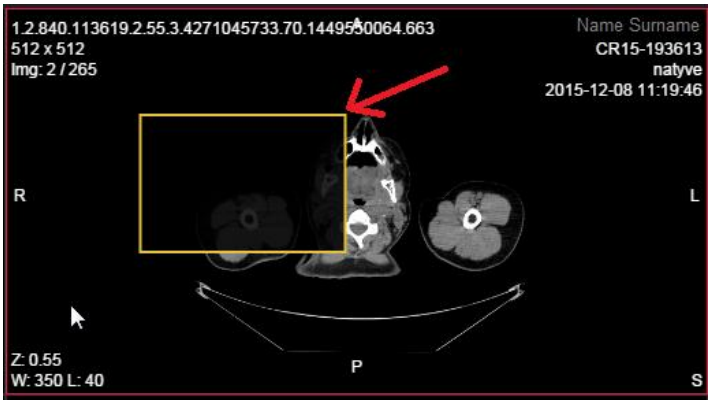


Figure 108. Annotation window.

- double-click the left mouse button on the annotation text window and now you should be able to write an annotation.
- write an annotation for your study image:

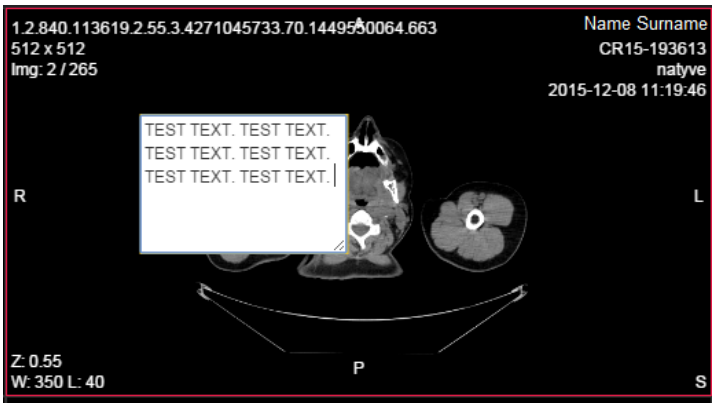


Figure 109. Annotation text.

To **save annotation:**

- once you have written an annotation text you will be able to save it.
- move your mouse cursor to the upper toolbar and select icon “Rulers”.
- click on the icon “Rulers”, then select **“Save Annotation”** from the list.
- annotation saving window will appear:

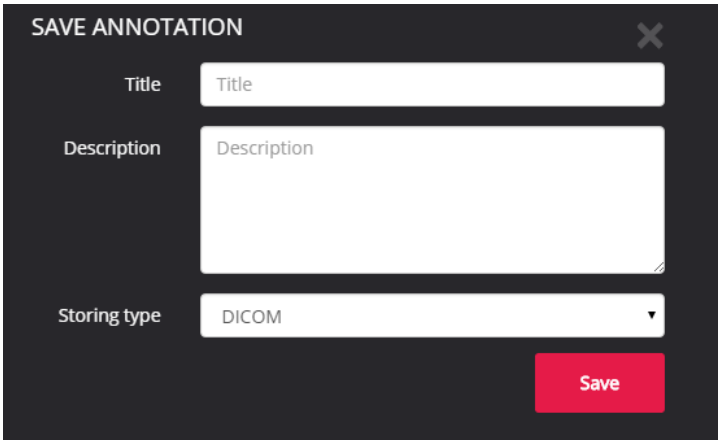


Figure 110. Save annotation window.

- system opens new annotation form. The following information can be filled:

  - title (required);

  - description;

  - storing type: DICOM, JPEG.
- enter the title and description if needed.
- click **“Save”** annotation.
- system saves annotation with the following information:

  - title (required);

  - description;

  - drawn measurements;

  - written text.

- once the annotation has been saved, the annotation mark will appear next to the study image (*see Figure 107*).

To view annotation:

- if there are several annotations, user can choose which one to review.
- in order to view the annotation drag and drop the study image (the one that has the annotation mark) to the main screen and the annotation icon will appear on the toolbar:

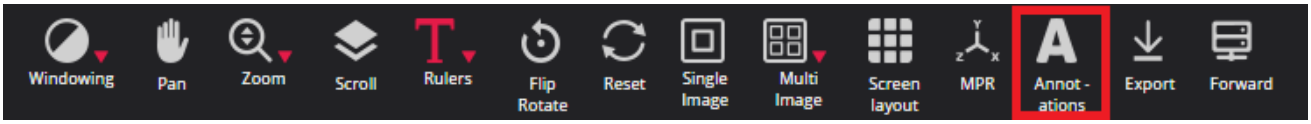


Figure 111. Annotations icon.

- move your mouse cursor to the **"Annotations"** icon.
- click on the icon and choose an annotation from the list:

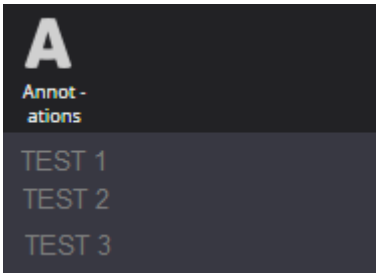


Figure 112. List of annotations.

- click on the annotation you have chosen to view and the saved annotation will appear on the screen with an information that has been saved previously (text and measurements in this case):

Figure 113. View annotation.

Export and Forward on HTML5 platform

The button “**Forward**” is used to send the selected study to the remote device.

To **Forward** the study:

- select or open the study you would like to send and click “**Forward**”

- the forwarding window appears:

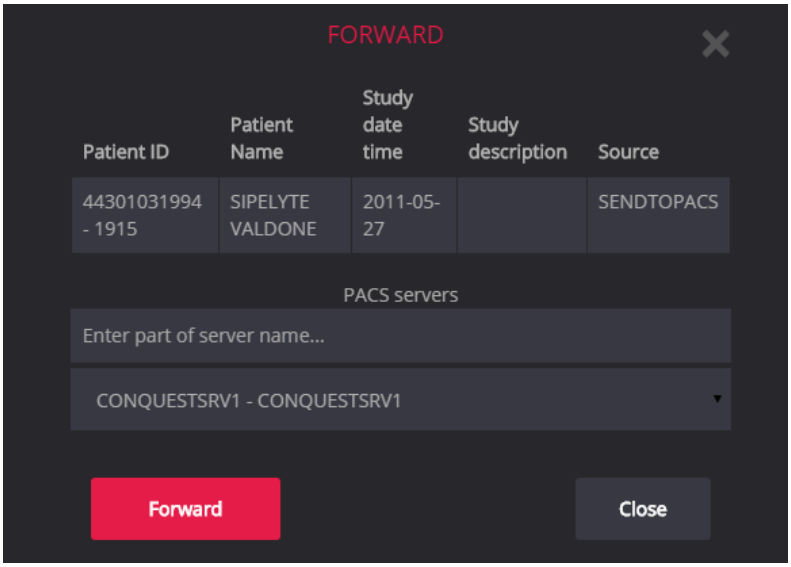


Figure 114. Study forwarding on HTML5.

- choose a device from the list;
- click “Forward”.

To **Export** the study (to burn it on a CD/DVD or save it on your computer):

- select or open the study that you want to write on the CD or DVD and click “**Forward**”:

- the export window appears (see next page):

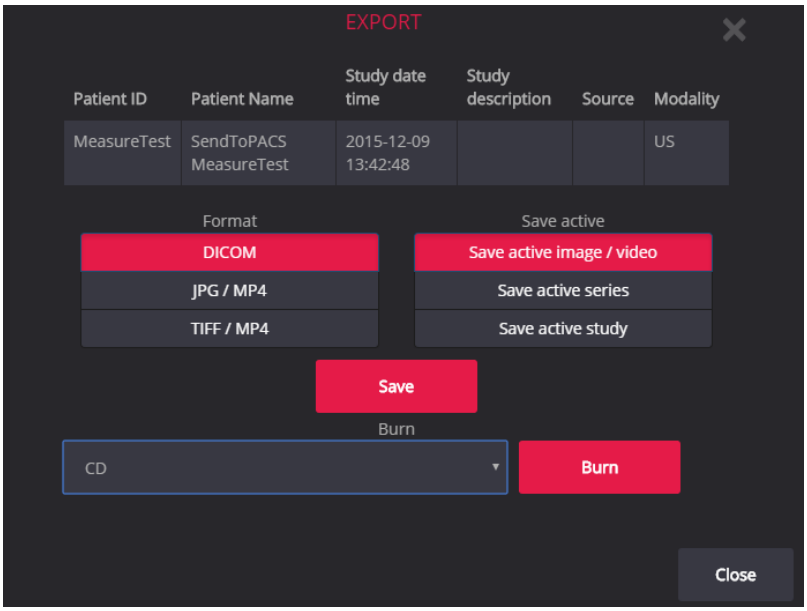


Figure 115. Export menu.

To **Export** the study (**to burn it on a CD**):

- choose CD, DVD or Unlimited. (Splitting into volumes is implemented only under PacsOne.)
- click “**Burn**”.

After a while two buttons "Download ISO" and "Burn ISO" will appear for every created volume. Click "Download ISO" in order to download a disk image with the .iso file extension, and burn it with your favorite CD/DVD burner software. Click "Burn ISO" if you have installed a corresponding product by Softneta, MedDreamBurn; then a third–party CD/DVD burner will start automatically.

To **Export** the study (**to save it**):

- choose the format, then select to save an image, a series of images or an active study.
- click “**Save**” and choose a folder where you prefer to save the images in your computer. Click **“Save”** again

System menu functions on HTML5 platform

You can open a system menu with functions “About” and “Log out” by tapping on the right top corner icon marked in red and choose functions from the pop-up window (*Figure 116*):

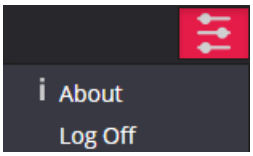
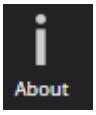


Figure 116. System menu.



Information window will display with the following information.

To close the window click on

or icons.

Figure 117. Information window.

Information window will display:

1. Full product name;
2. Version;
3. GUI version;
4. Release date;
5. Medical device class;
6. ID of the notified body;
7. License to;
8. Concurrent connections;
9. Modules;
10. Valid to – empty if there is no termination in time;
11. Update to – date till the technical support and updates are provided;
12. Contacts – Softneta UAB contacts.

Log out when access is no longer needed.

Report module

Complete report editing or printing of the study are available by clicking the button on the study header.

Note: This module can be used while MedDream is in demo mode; in the commercial mode it is licensed separately, therefore existing customers will need an updated license.

Figure 118. An icon of a filled report.

It will open a report window:

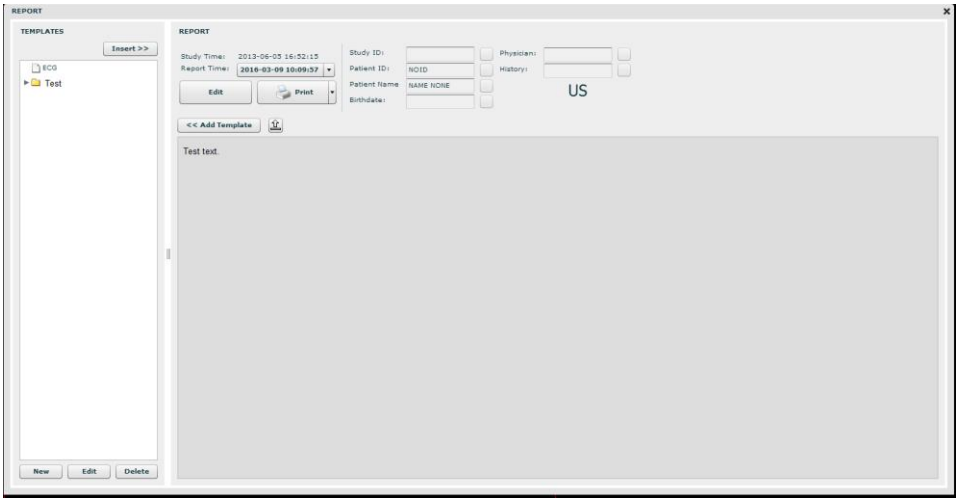


Figure 119. Filled report.

In the Report window you may edit and print the study report. The following buttons are used in order to:

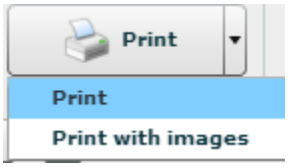
Insert a template. The button is active only in “Edit” mode. After clicking “Insert” button, you are asked to confirm the action as the entire text will be replaced.

Add a template to the list. Once you are satisfied with the content, you can save it as a template (either existing or new one).

Save a report. “Save” button changes to “Edit” button once it is clicked.

Write a report (edit mode).

Insert the nearby information into the annotation.



Print just the text or including all images.

Open an empty form of a template.

Enable editing of a selected template.

Delete the selected template.

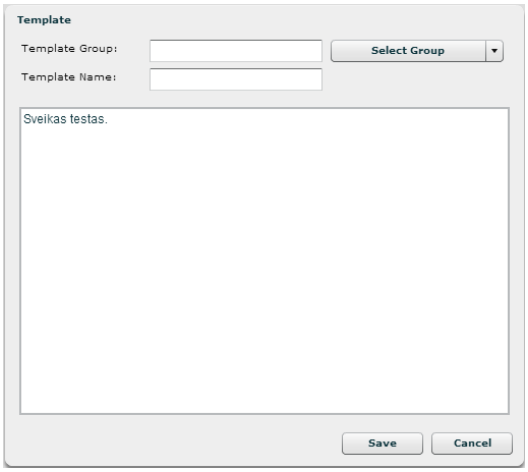


Figure 120. Template.

To close the Window.

ECG module

This module allows you to view DICOM ECG wave data.

This module can be used while MedDream is in demo mode; in the commercial mode it is licensed separately, therefore existing customers will need an updated license.

Figure 121. ECG view.

For ECG behavior is different:

- Measurement tools are changed into ECG measurement tools.

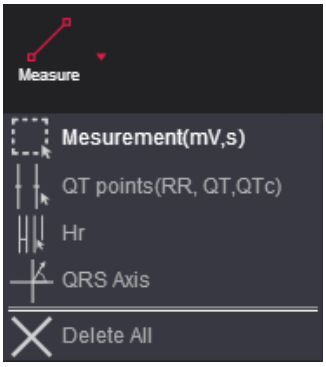


Figure 122. ECG measurements.

- Image manipulation buttons are disabled.

The “**Measurement**” button is used to measure fragment length in seconds, mV and calculate BPM.

To measure:

- Select “Measurements”.
- Move the mouse cursor on the point you want.
- Click down and move mouse over an ECG wave.

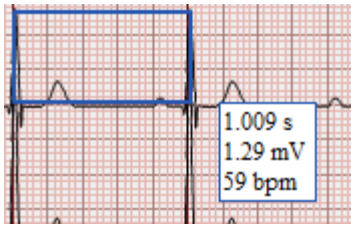


Figure 123. Measurements

The „**QT points**“ button is used to measure wave QT points: RR, QT and QTc.

To measure:

- Select “QT points”.
- Move the mouse cursor on the point you want to set Q point and click.
- Move the mouse cursor on the point you want to set T point and click.

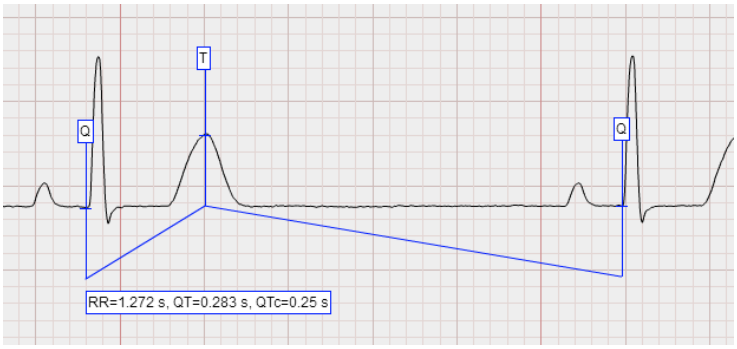


Figure 124. QT points.

- Move the mouse cursor on the point you want to set last Q point and click (double click also works).

The button “**HR**“ is designated to measure heart rate:

Figure 125. HR measurment tool.

- Select “HR“ measurment tool;
- Move the mouse cursor on the point you want to set R point –click once left mouse button;
- Move the mouse cursor on the point you want to set next R point –click once left mouse button;
- Now you can compare given interval with other R points.

The „**QRS Axis**“ is used to measure cardiac interventricular partition and ventricular depolarization spreading.

- Select „QRS axis“ measurement tool;
- Move the mouse cursor on the point you want to start your “QRS” point, “Q” - click once left mouse button;
- Move the mouse cursor on the point you want to end your “QRS” point, „S“ point - click once left mouse button;

Figure 126. QRS Axis measurment tool.

Change horizontal scale (mm per second).

Change vertical scale (mm per mV).

Display ECG annotation data.

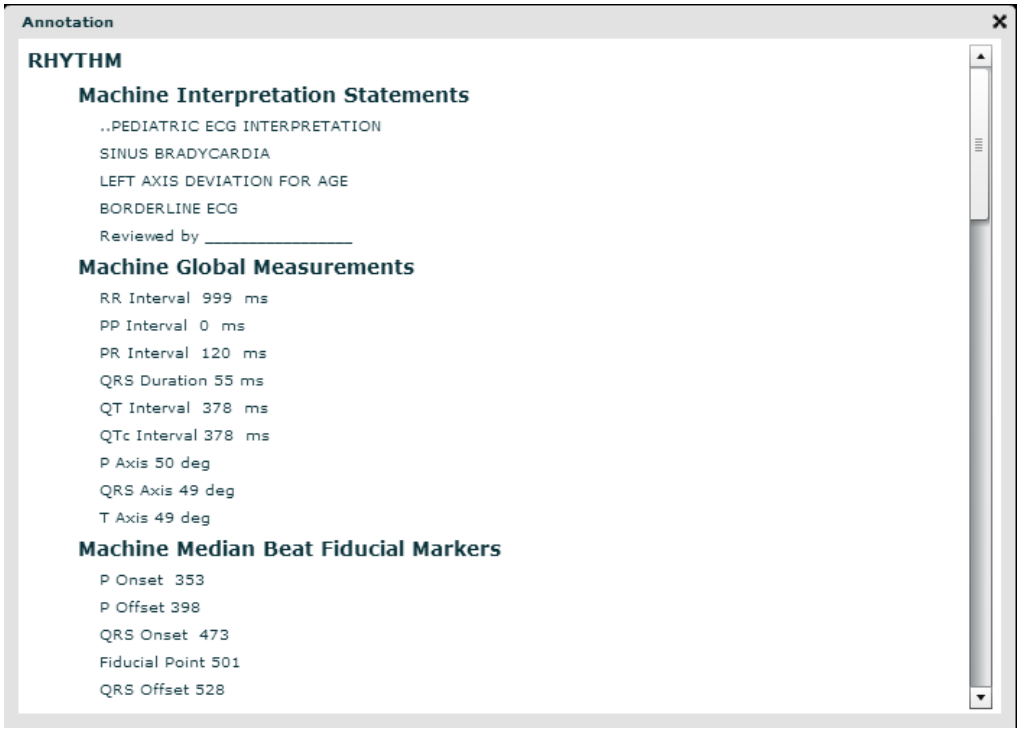


Figure 127. ECG annotation.

Button to adjust ECG data position.

Button to adjust ECG data zoom.

Is used to display remaining data. By default first 5 seconds of ECG wave data is visible.

It is used to "**Compare ECG data**". In order to compare follow the steps indicated below:

- Open the first ECG study;
- Go back to the main search window and select as many studies as you want (see section "Opening Multiple Studies");
- Select an image layout (see page 21);
- Tick the check-box next to the ECG studies that you want to compare:

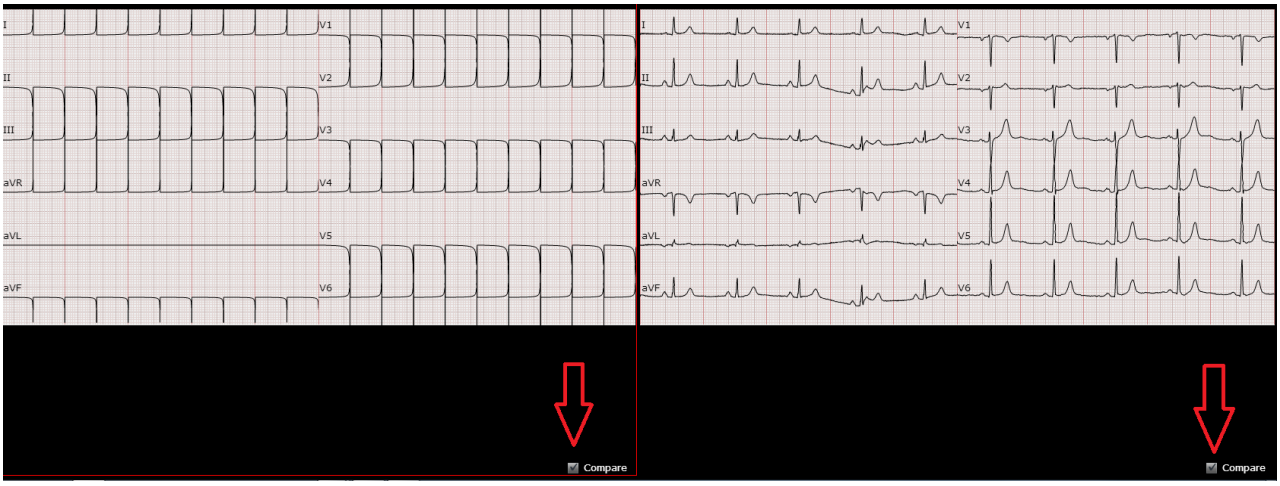


Figure 128. Compare tick-box.

Once you have done this, click on a

button and the following window will appear on the screen:

Figure 129. ECG comparison.

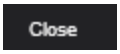
There will be possible to manipulate the image with the following tools:

"**Hand**" button allows you to position images within the pane. This feature is especially useful when the image is larger than the pane, as it usually is after zooming in.

To move an image within the pane:

- On the Tools menu, click "**Hand**"
- Position the cursor over the image you want to move and click-and-drag the cursor around the pane to move the image.
- Release the mouse button to leave the image in its new position.

"Zoom +/-" button is used to increase and decrease the selected image. Click the left button on your mouse and drag it upwards to zoom in and downwards to zoom out.

Click  button in order to close ECG comparison window.

SR view

SR view enables to view structured reports.

Figure 130. SR window.

SR window displays standard structured DICOM reports.

SR window uses the following window action buttons:

- To display window on the right side;
- To display window on the left side;
- To maximize the Window;
- To minimize the Window;

PDF view

PDF view enables to view PDF files encapsulated in DICOM format.

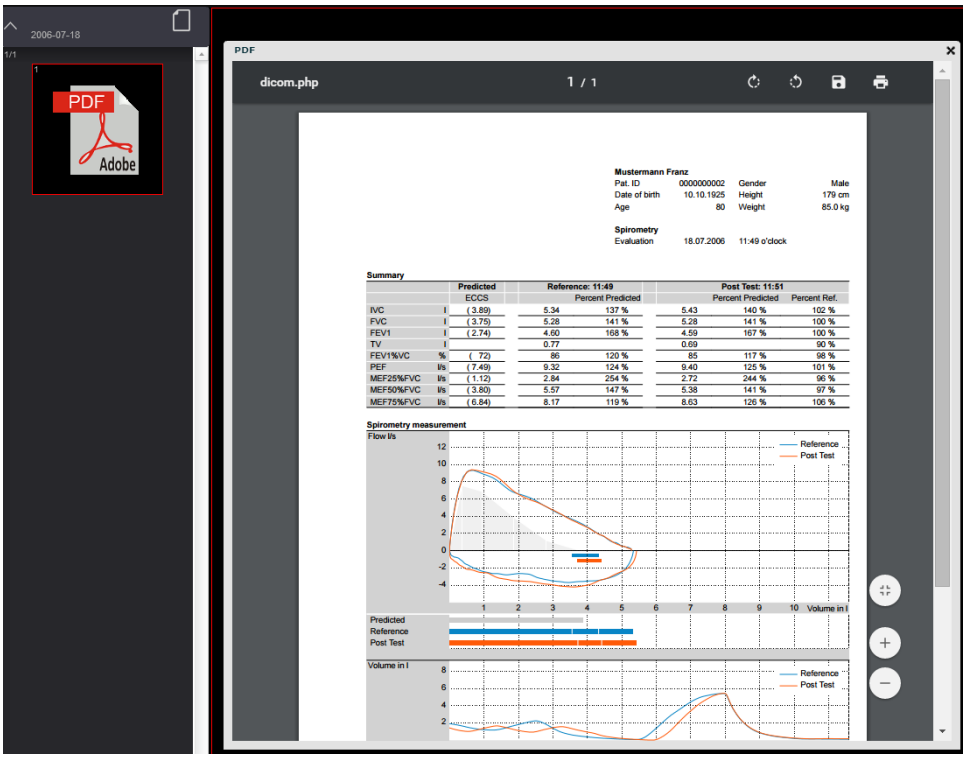


Figure 131. PDF window.

PDF window displays a standard PDF reader. Some Web browsers have built-in readers, in other cases the workplace needs additional software like Adobe Acrobat Reader.

Video view

Software enables to view video files, MPEG2 and MPEG4 (H.264), encapsulated in DICOM format.

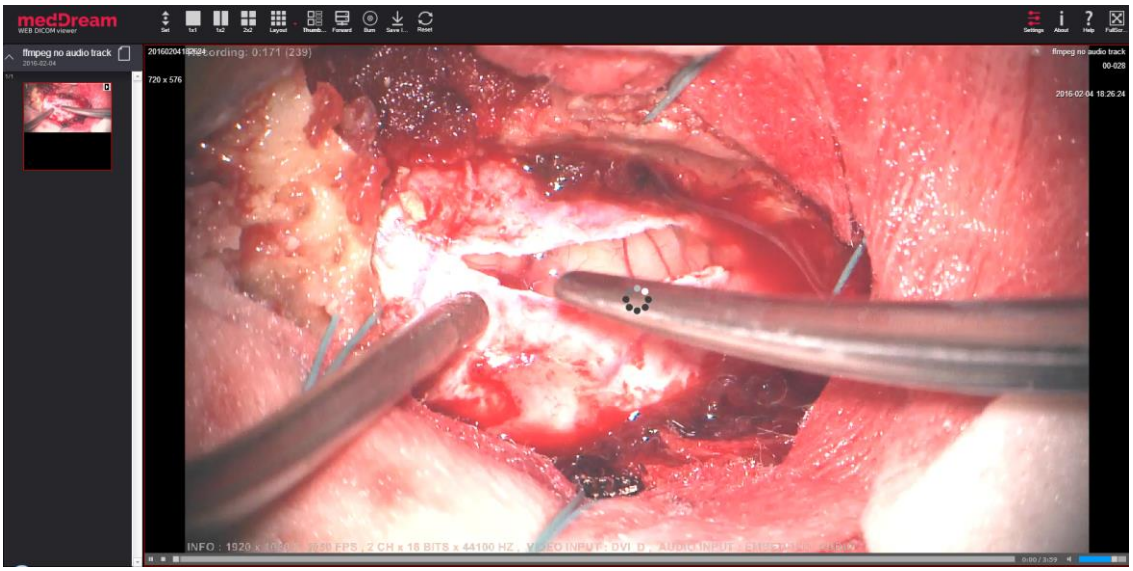


Figure 132. Video player.

Video is played with the standard video player available.

Settings

To change settings of MedDream's Flash viewer, click "Settings" button

in the toolbar. This button is displayed for the database administrator only. In MySQL it's "root", in Microsoft SQL Server — "sa", with DCM4CHEE it's also possible to use the internal user account "admin". In some configurations like "SQLite3", "DICOM", "WADO" and "FileSystem", where any login or password is accepted, you will need to use "root", too.

The Settings window will open.

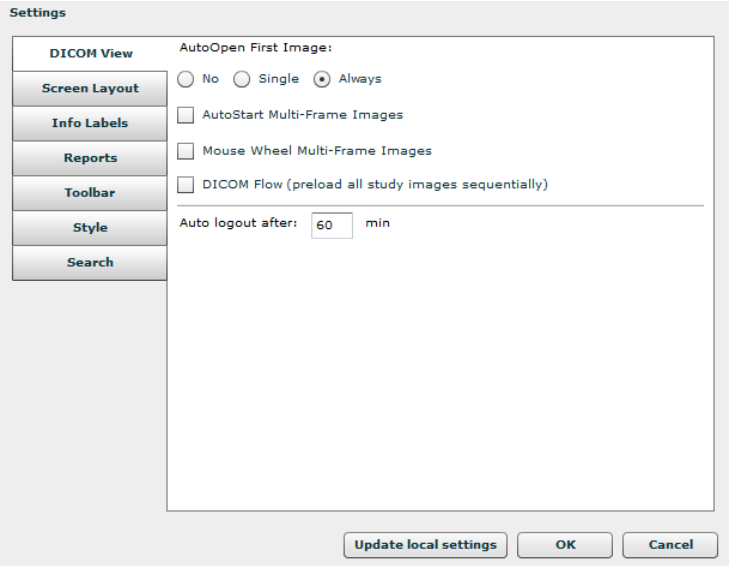
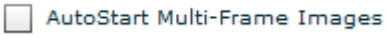
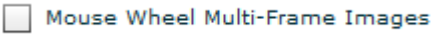
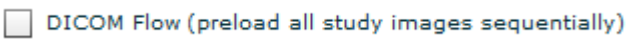


Figure 133. DICOM View settings.

In the "DICOM View" tab the following parameters are indicated:

	The image does not open automatically when the study is opened.
	Is opened only if the study consists of one image.
	The first image is always opened automatically.
	Automatically start playing multi-frame images.
	Allow to scroll multi-frame images with mouse wheel.
	Automatically Logs you out of all logged in accounts in case you forget to sign out. (Not available while in DEMO mode.)
	Cache all images in advance. After an image is cached, scrolling through adjacent images takes very little time. But, the entire study must fit into browser's memory.

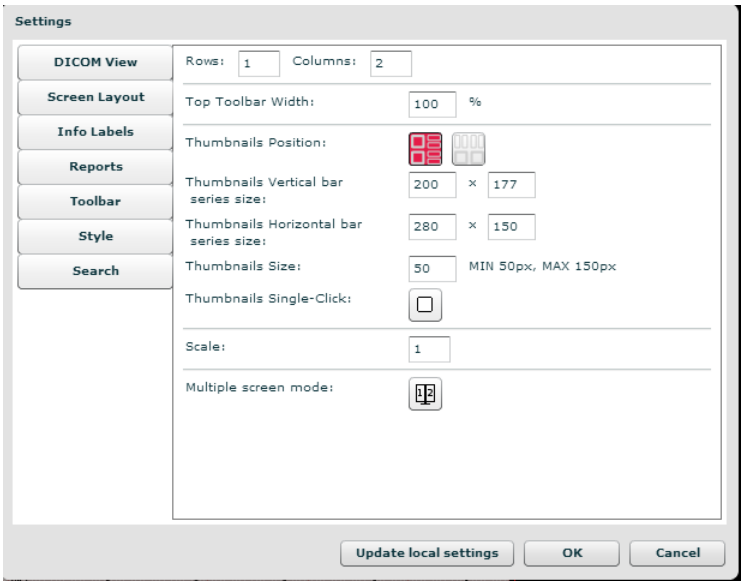


Figure 134. Screen layout settings.

In the “Screen layout” tab the following parameters are indicated:

Rows: 1 — Indicates the layout`s number of rows (maximum 3);

Columns: 1 — Indicates the layout`s number of columns (maximum 3);

Thumbnails Vertical bar series size: 200 × 177
Thumbnails Horizontal bar series size: 280 × 150 — Indicates the size of vertical and horizontal thumbnails` series bar

Thumbnails Size: — Indicates the size of the thumbnail (minimum size is 50px, maximum size 150px).

Thumbnails Position: — Set position of the thumbnail bar: vertical, left or horizontal, bottom.

Thumbnails Single-Click: — Once the button is activated, a single click on an image icon will open the image (otherwise a double click is required).

Multiple screen mode: — Once the button is activated, the use of multiple physical display devices can be used (such as monitors).

Scale: — Set scale of toolbar buttons.

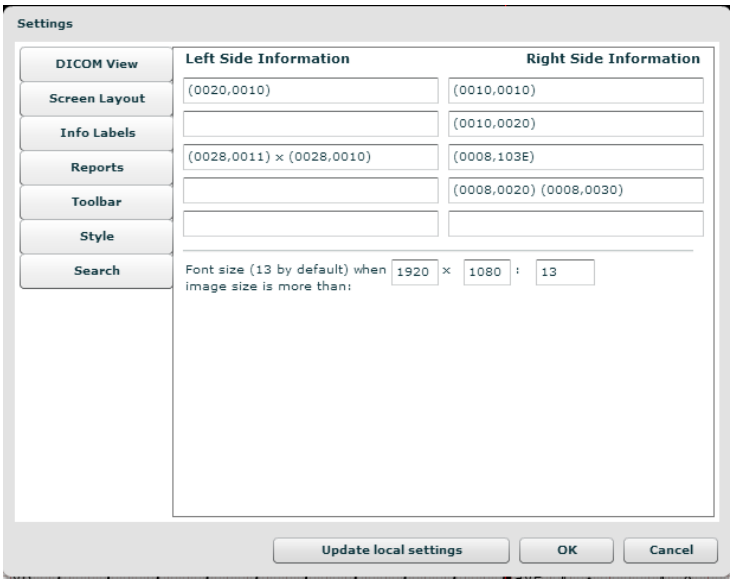
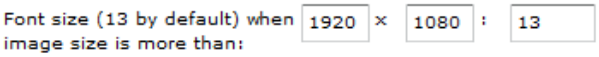


Figure 135. Info labels settings.

The “Info Labels” tab is used to indicate information (from tags of a DICOM file) that is shown over the image.



Set font size of info labels and other labels in the image view when **this view** is larger than defined dimensions. By default the size is 13.

When using a high–resolution (5 megapixels etc) monitor as an addition to an ordinary monitor, you might need a larger font, which also might be too large for the smaller monitor. After adjusting the text size, do not forget to adjust view dimensions so that on a smaller monitor the default size is still chosen.

This setting can be saved on a particular workplace among *local settings* (a feature of the Web browser). It can't be applied globally. Therefore you will need to click the “Update local settings” button and log into MedDream anew.

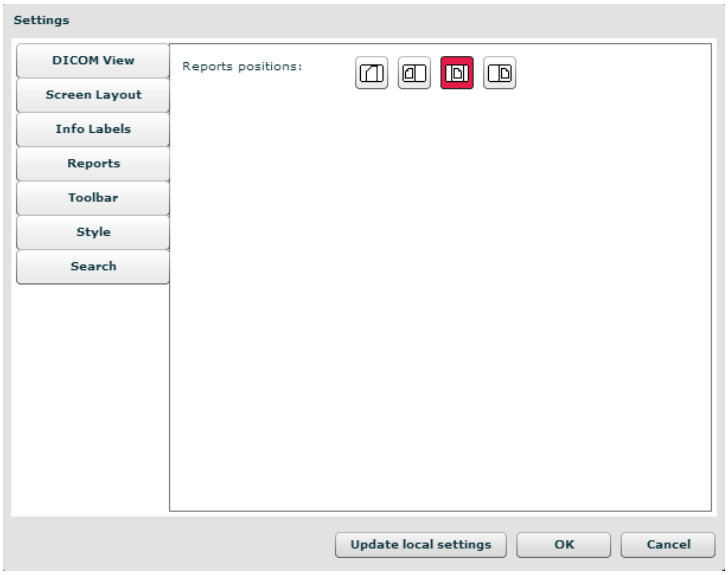


Figure 136. Reports setting.

Reports positions:

- the report is shown over the main layout.

- the report is shown on the left side of the main layout.

- the report is shown on the center of the main layout.

- the report is shown on the right side of the main layout.

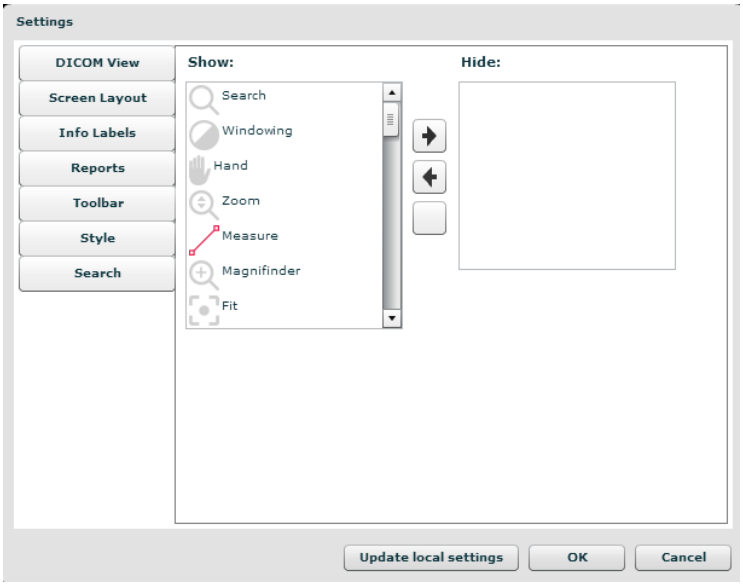


Figure 137. Toolbar settings.

The “Toolbar” tab enables user to show the most commonly used buttons on the toolbar, while the rarely used tools can be hidden. Use arrows and to manage the shown and hidden tools; you can also drag buttons with the mouse. The button hides the whole toolbar.

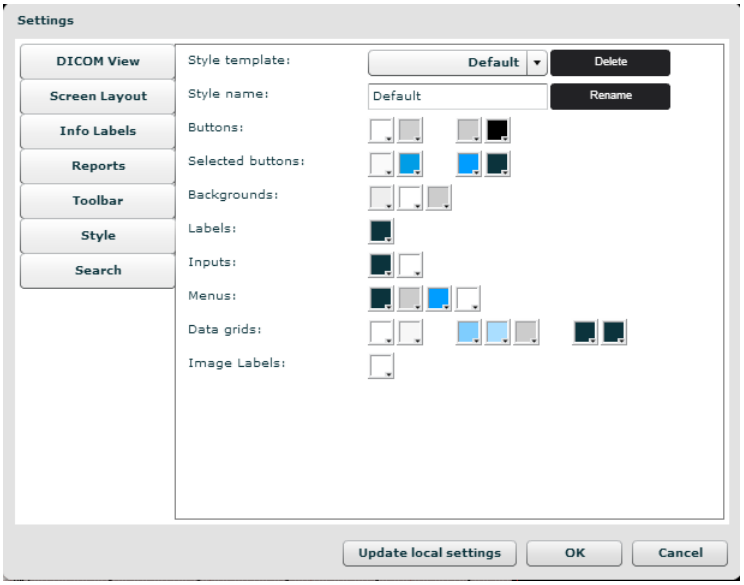


Figure 138. Style settings.

The „Style“ tab serves to set the style (color of backgrounds, buttons, etc.) for visualization on the desktop or for printout, respectively. It contains a list of variables that correspond to individual data input regimes.

OK	Save global settings.
Cancel	Close window. On style change – need to restart application in order to return to previous style.
Update local settings	Update/save local settings. This option enables a particular workplace to have its own settings. The browser must support local storage.

The „Search” tab serves to set which fields will be seen on search menu.

The “Search” tab enables user to show the most commonly used buttons on the toolbar, while the rarely used tools can be hidden.

Use arrows and to manage the shown and hidden tools; you can also drag buttons with the mouse.

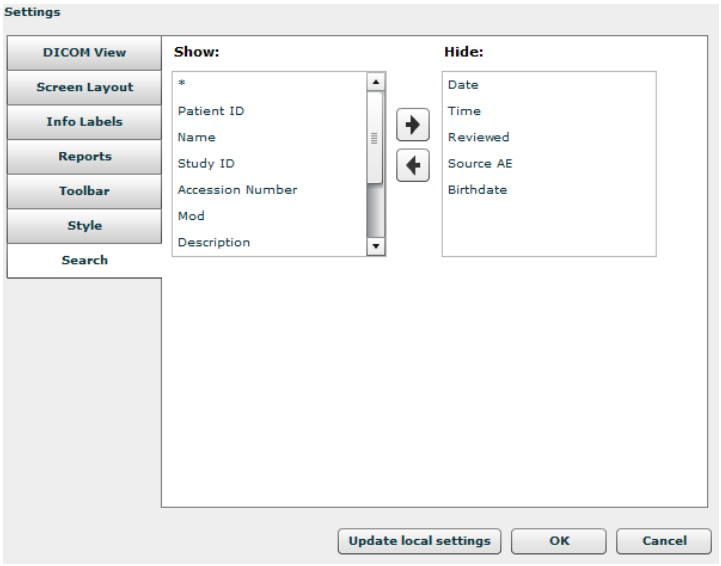


Figure 139. Search settings.

Default Viewer

By default, MedDream Web DICOM Viewer opens in SWF (Flash) view. However, there is HTML5 option available. If necessary to make changes, contact your system administrator because he is the only one who can see the “Settings” window and make changes.

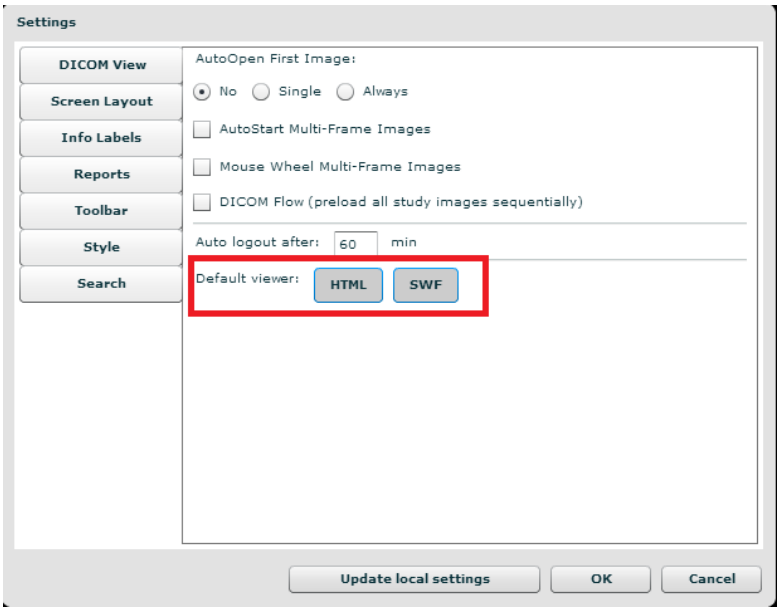


Figure 140. Default Viewer settings.

Warning! Once SWF is disabled it is possible to turn it back only with editing settings.xml. The “Default Viewer” setting may result in a dead-end since it is not possible to view “Settings” window via HTML5 platform.

License registration

This allows activating the software for legal use.

As a notification about the DEMO version appears, click the “Register” button. The registration button also appears in the Information window. The button is displayed **only for administrators and only on the Flash platform**.

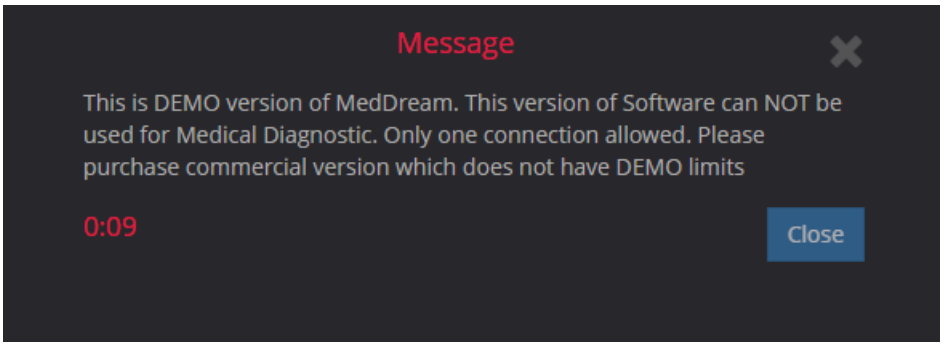


Figure 141. Demo notification on HTML5 platform.

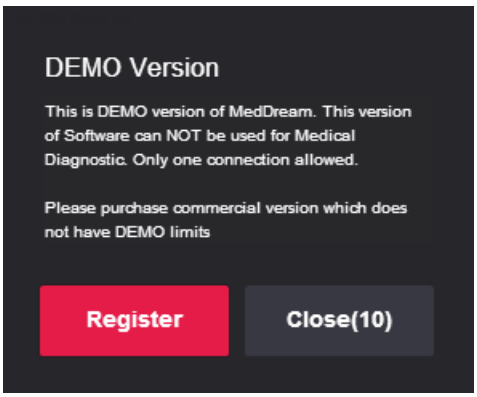


Figure 142. Demo notification on Flash platform.

The registration window will appear. Fill in the form and click the “Register” button.

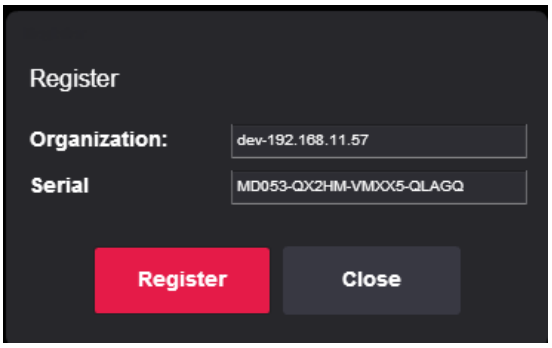
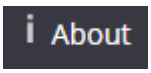


Figure 143. Registration window.

Information window

In the main window, click the “Information window” button. 

Information window will display:

1. Full product name;
2. Version;
3. GUI version;
4. Release date;
5. Medical device class;
6. ID of the notified body;
7. License to;
8. Concurrent connections;
9. Modules – Report, ECG, Video;
10. Valid to – empty if there is no termination in time;
11. Update to – date till the technical support and updates are provided;
12. Contacts – Softneta UAB contacts.

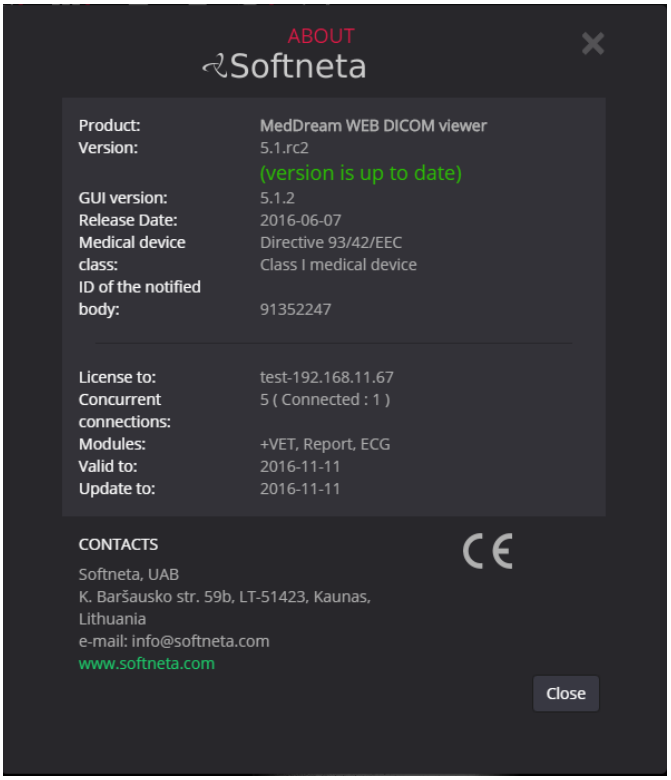


Figure 144. MedDream information window on Flash platform.

Table of Figures

Figure 1. Logging in. 11
Figure 2. Language selection in a Log in window. 11
Figure 3. "Search" window 12
Figure 4. Search filters. 12
Figure 5. Search according to dates. 13
Figure 6. Date search options. 13
Figure 7. Search according to modalities. 13
Figure 8. Modalities search: All. 13
Figure 9. Search results on Flash platform. 14
Figure 10. Tick box. 15
Figure 11. Export function. 15
Figure 12. Forward function. 16
Figure 13. Study selection. 17
Figure 14. Information table on HTML platform. 17
Figure 15. Opened multiple studies. 18
Figure 16. Study Report icon location. 19
Figure 17. Report icon on the study file. 19
Figure 18. Study report. 19
Figure 19. Screen layout. Option No.1. 21
Figure 20. Screen layout. Option No.2. 21
Figure 21. Drag-and-drop the image into the pane. 22
Figure 22 Multiple layout: 1x1 and 2x2. 22
Figure 23. Reference lines option. 24
Figure 24. Image manipulation tools. 25
Figure 25. Level/Window button options. 25
Figure 26. Transformation possibilities. 26
Figure 27. Inverted image. 26
Figure 28. Opening Cine mode function. 28
Figure 29. Playing images as one movie. 28
Figure 30. MPR frame selection. 29
Figure 31. Loading MPR. 29
Figure 32. Warning message. 29
Figure 33. MPR. 30
Figure 34. MPR toolbar. 30

Figure 35. Curve measurement. 31
Figure 36. Measurement tools. 32
Figure 37. Intensity measurement. 33
Figure 38. Line measurement. 33
Figure 39. Angle measurement. 33
Figure 40. Angle measurement between intersecting lines. 34
Figure 41. Polyline measurement. 34
Figure 42. Area measurement. 35
Figure 43. Volume measurement. 35
Figure 44.VTI measurement. 36
Figure 45. STD measurement. 36
Figure 46. Calibration function. 37
Figure 47. Cobb angle measurement. 37
Figure 48. Points measurement. 37
Figure 49. Save annotation. 38
Figure 50. Long axis points. Figure 51. Short Axis points. 38
Figure 52. Demonstration of VHS measurement. 39
Figure 53. Rotation demonstration. 39
Figure 54. Norberg angle measurement. 40
Figure 55. Center of the circle radius. 40
Figure 56. The outer part of the circle. 41
Figure 57. Demonstration of the Norberg Angle measurement. 41
Figure 58. Norberg Angle. 42
Figure 59. Printing options. 43
Figure 60. Selection of number of images on a page. 43
Figure 61. Saving images. 44
Figure 62. Saving location selection. 44
Figure 63. Study forwarding. 45
Figure 64. CD burning. 45
Figure 65. Export menu. 46
Figure 66. Logging in. 47
Figure 67. Search window 48
Figure 68. Search according to dates. 48
Figure 69. Date search options 49
Figure 70. Search according to modalities. 49
Figure 71. Modalities search 50

Figure 72. Search results. 51
Figure 73. Select image 51
Figure 74. Image manipulation tools. 52
Figure 75. Transformation possibilities. 53
Figure 76. Measurement tools. 54
Figure 77. Line measurement. 55
Figure 78. Angle measurement. 55
Figure 79. Polyline measurement. 56
Figure 80. System menu. 57
Figure 81. View mode. 57
Figure 82. Information window. 58
Figure 83. Logging in. 59
Figure 84. "Search" window 60
Figure 85. Search filters. 60
Figure 86. Search according to dates. 61
Figure 87. Date search options. 61
Figure 88. Search according to modalities. 62
Figure 89. Modalities search: All. 62
Figure 90. Search results onHTML5 platform. 63
Figure 91. Image manipulation tools. 64
Figure 92. Level/Window button options. 64
Figure 93. Resolution button options. 65
Figure 94. Comparison possibilities. 65
Figure 95. Multiple viewports. 66
Figure 96. Multiple viewports (Mediastinum view mode). 66
Figure 97. Reset selection. 67
Figure 98. MPR selection. 67
Figure 99. MPR frame selection. 67
Figure 100. MPR download process. 68
Figure 101. Transformation possibilities. 68
Figure 102. Measurement tools. 69
Figure 103. Line measurement. 69
Figure 104. Angle measurement. 70
Figure 105. Angle measurement between intersecting lines. 70
Figure 106. Polyline measurement. 71
Figure 107. Annotation mark. 72

Figure 108. Annotation window. 72
Figure 109. Annotation text. 73
Figure 110. Save annotation window. 73
Figure 111. Annotations icon. 74
Figure 112. List of annotations. 74
Figure 113. View annotation. 74
Figure 114. Study forwarding on HTML5. 75
Figure 115. Export menu. 76
Figure 116. System menu. 77
Figure 117. Information window. 77
Figure 118. An icon of a filled report. 79
Figure 119. Filled report. 79
Figure 120. Template. 80
Figure 121. ECG view. 81
Figure 122. ECG measurements. 81
Figure 123. Measurements 81
Figure 124. QT points. 82
Figure 125. HR measurment tool. 82
Figure 126. QRS Axis measurment tool. 83
Figure 127. ECG annotation. 83
Figure 128. Compare tick-box. 84
Figure 129. ECG comparison. 85
Figure 130. SR window. 86
Figure 131. PDF window. 87
Figure 132. Video player. 88
Figure 133. DICOM View settings. 89
Figure 134. Screen layout settings. 90
Figure 135. Info labels settings. 91
Figure 136. Reports setting. 92
Figure 137. Toolbar settings. 92
Figure 138. Style settings. 93
Figure 139. Search settings. 94
Figure 140. Default Viewer settings. 95
Figure 141. Demo notification on HTML5 platform. 96
Figure 142. Demo notification on Flash platform. 96
Figure 143. Registration window. 96

Figure 144. MedDream information window on Flash platform. 97

Index

C

Cine mode ... 28
Comparing multiple studies ... 23
Context menu functions ... 44
Context menu functions on HTML5 platform ... 77
Context menu functions on Mobile Version ... 57

E

ECG module ... 81
Explanation of symbols used ... 5
Export and forward study ... 45
Export on HTML5 platform ... 76

I

Image localization ... 24
Information window ... 97
Installing MedDream for MedDream PACS Quick Install (Windows and Linux) ... 8
Introduction ... 6

L

License registration ... 96
Logging on to MedDream ... 11, 59
Logging on to MedDream Mobile Version ... 47

M

Manipulating images ... 25
Manipulating images on HTML5 platform ... 64
Manipulating images on Mobile Version ... 52
Measuring Images ... 32
Measuring images on HTML5 platform ... 69
Measuring Images on Mobile Version ... 54
MedDream Web DICOM Viewer Mobile Version ... 47
Minimal hardware requirements ... 7
Minimal software requirements ... 7
Multi-planar reconstruction (MPR) ... 29

N

Notes on the user`s manual ... 4

O

Opening multiple studies ... 17

P

PDF view ... 87
Printing images and series ... 43
Purpose and availability of documentation ... 4

Q

Questions and comments 4

R

Reading study reports 19
Report module 79

S

Saving Annotations on HTML5 platform 72
Search of studies 12, 60
Search of studies on Mobile Version 48
Settings 89
SR view 86

T

Table of Contents 3
Table of Figures 98

V

Video view 88
Viewing and analyzing images 21
Viewing one or multiple studies 21

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Softneta UAB
K.Barsausko str. 59
LT-51423 Kaunas, Lithuania