

# IconoTech®

## Software for creation and submission of teaching files

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### Demo version user guide

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*(This is a preliminary document)*

## Introduction

**IconoTech** is a software for creation and submission of teaching files. It integrates directly DICOM files and permit to:

- Collect medical images together with description fields,
- Create interactive teaching files using a simple user interface
- Teach students who can browse the database and play cases
- Retrieve a specific case using a sophisticated query module
- Create image subselection to prepare course or electronic presentation
- Send cases or images by e-mail directly from IconoTech

**IconoTech** is a Windows compatible software. It accepts various types of image format (BMP, JPEG, PICT). However, it is built in order to be fully integrated in professional DICOM environments and then permit to:

- Receive DICOM images.
- Integrate automatically images in the database using information contained in DICOM headers.
- Adapt windowing parameters to change contrast and brightness.
- Convert DICOM images in various image formats (BMP, PICT, JPEG, GIF).

**IconoTech** is a software including Internet functions. It contains a web client, without user interface, which allows to download references using the unique PubMed identifier. IconoTech can send cases and/or images by e-mail.

**IconoTech** is compatible with e-mail submission of teaching files to international web servers, such as EuroRad.org. This submission is using a XML format.

## Installing IconoTech

### **Configuration**

IconoTech runs on PC, Windows 95, 98, NT, with 15 Mb of free RAM, in complement of the RAM needed by the operating system. Check that your disk has enough space free to install the software (about 20-30 Mb, depending on the configuration) and then to store DICOM images that you want to integrate in your teaching files. One gigabyte or more could become rapidly necessary.

### **Demonstration version**

The DEMO version has almost all the functions of the STANDARD version except that the database is limited to a maximum of 10 consecutive cases.

### **Time limited version**

The time limited version has all the functions of the STANDARD version. At the end of the evaluation period there is an automatic transformation in a DEMO version.

### **"Unzip" the file IconoTech.zip**

Unzip the file Iconotech.zip in a new directory *IconoTech* which then contains :

- The Iconotech software (*IconoTech.exe*).
- The database IconoTech (*IconoTech.4DD* and *IconoTech.4DR*) which is containing data, except images files.
- The *Win4DX* directory which contains plug-ins.
- The software *IconoScp.exe* which is a DICOM store module from ETIAM company ([www.etiam.com](http://www.etiam.com)). This is the DICOM receiver which places received images in the *Dicom import* directory.
- Other files used by IconoTech software.

At the first launch, IconoTech will create (if they are not already existing):

- The *Images* directory which is the default directory to store image files (DICOM or other). Inside this directory, each teaching file has its own directory containing image files and a XML file. This file is an export of the various text data associated to the images and permit a retrieve of teaching files in case of a corruption of the database.
- The *DICOM Import* directory where DICOM images are received.
- The *Export* directory which is the default export directory.
- The *Case Import* directory which can be used to automatically import teaching files coming from an other database.

## License

### **« *Demonstration* » license**

The demo version limitations are:

1. Only 10 simultaneous cases in the database. You can collect cases and submit them to a distant server then delete them to be able to create new cases. When the limit of 10 cases is reached, it is not possible to add new cases and :
  - ? the DICOM receiver is stopped,
  - ? the import of images is also blocked.
2. The DICOM receiver is only working when IconoTech is running.

### **« *Time limited* » license**

There is no limitation until the deadline is reached. Then the license is transformed in a demo version (cf supra).

### **« *Standard* » license**

It contains all functions needed to collect and submit teaching files.

### **« *Gold* » license**

A Gold license will offer more functions, and particularly DICOM Store user, QnR and Print.

### ***License registration***

Contact the InfoConcept company to buy a license (contact@infoconcept.fr) and enter license code using the « Licensing » button in the main screen.

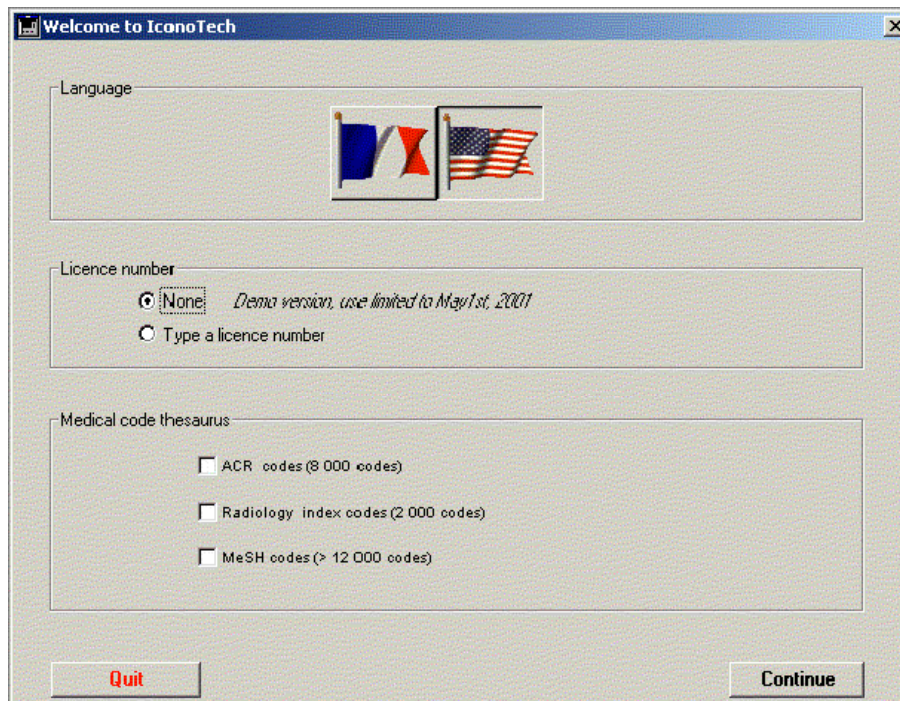
## IconoTech first use

Double-click on *IconoTech.exe* to get the configuration screen. The 3 pages allows to define the main preferences, such as the language, the medical codes, the administrator coordinates, the e-mail SMTP server parameters, and the DICOM reception parameters. Keep in memory the password of the administrator !

### ***First page : language, license and medical codes***

Select the language for the user interface.

If you have already a license code you can type it here. If not the software will stay in the demo version or the time limited version.



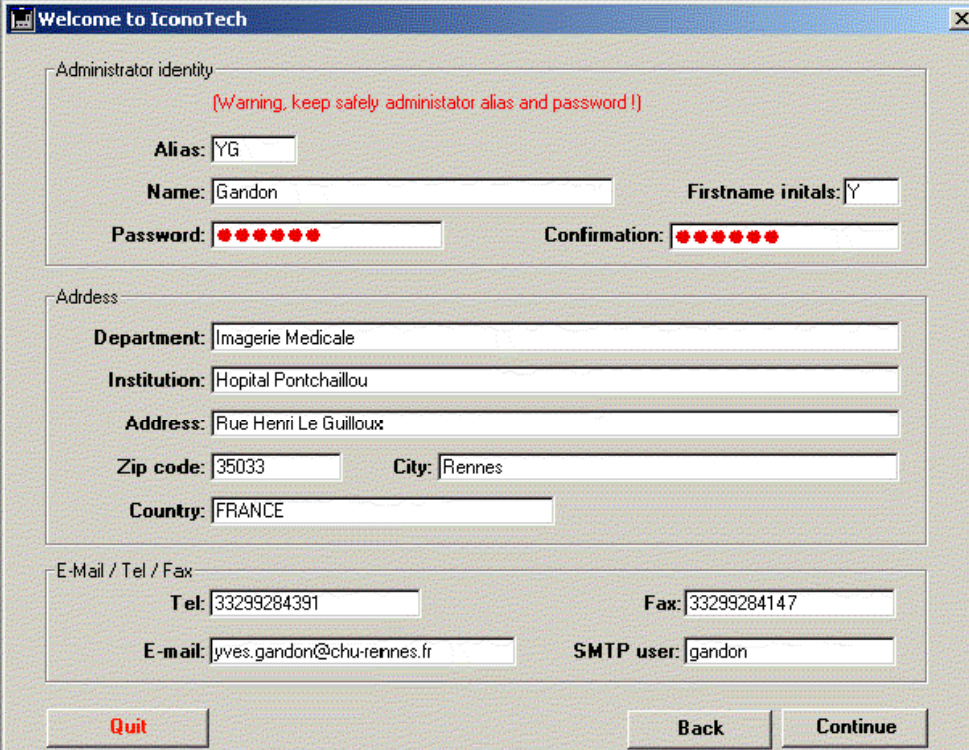
Then, you can select the medical codes to be integrated in the database. Three medical codes systems are compatible with the database (MeSH, ACR and Index of Radiology). The codes already existing cannot be integrated.



The ACR medical codes are the property of the American College of Radiology and you need to buy a license to ACR to use them in a Standard version !

## Second page : the administrator

Enter the database administrator coordinates and his password. It is usually the main user. Enter all the information you know, particularly the Institution address, it will be more easy after to describe other users in the *Preferences* module.



The screenshot shows a window titled "Welcome to IconoTech" with a close button (X) in the top right corner. The window is divided into three sections:

- Administrator identity:** Contains a warning message "[Warning, keep safely administrator alias and password !]" in red. Below it are fields for "Alias" (YG), "Name" (Gandon), "Firstname initials" (Y), "Password" (masked with red dots), and "Confirmation" (masked with red dots).
- Address:** Contains fields for "Department" (Imagerie Medicale), "Institution" (Hopital Pontchaillou), "Address" (Rue Henri Le Guilloux), "Zip code" (35033), "City" (Rennes), and "Country" (FRANCE).
- E-Mail / Tel / Fax:** Contains fields for "Tel" (33299284391), "Fax" (33299284147), "E-mail" (jves.gandon@chu-rennes.fr), and "SMTP user" (gandon).

At the bottom of the window are three buttons: "Quit", "Back", and "Continue".



Be sure that you will remember the name and password of the administrator of the database !

## Third page : e-mail server and DICOM receiver

If you know them, enter the parameters of your e-mail server (server SMTP). This is mandatory to be able to submit cases by e-mail to international web servers or to send by e-mail images to a colleague.

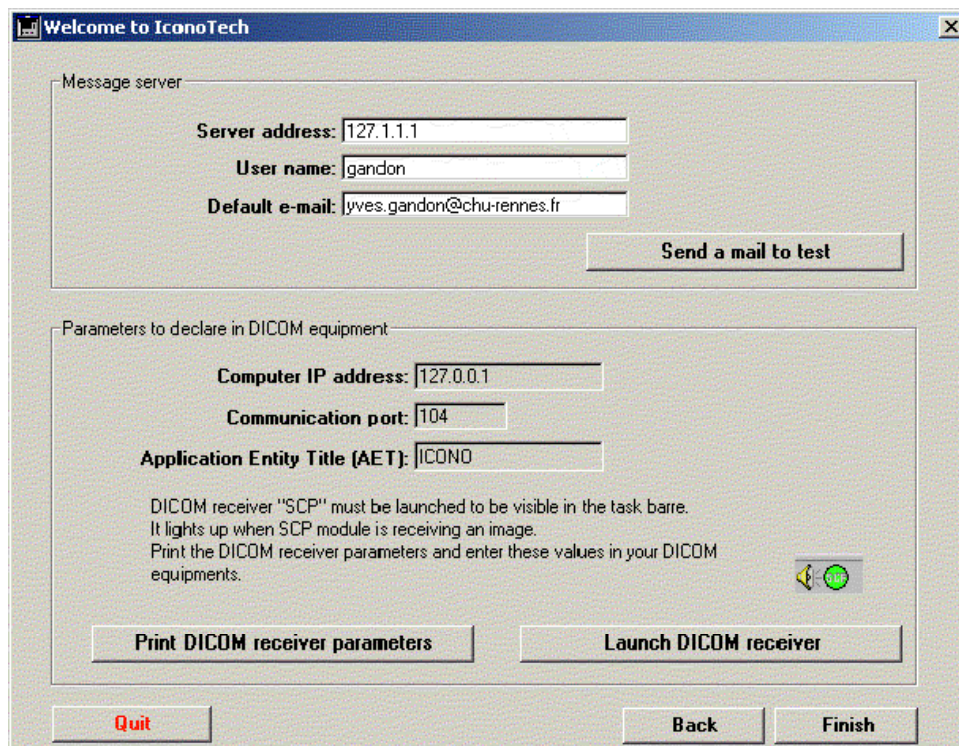
You can fill in the fields :

- *Server address* : IP address or host name of your SMTP server. It is usually a server which is inside your local network. If you access to internet by modem ask to your provider the name of the SMTP server and your access name.
- *User name* : the name which allows you to access the e-mail server, usually defined by your network administrator.

- *Default e-mail*: It is the default value which is going to be used to send e-mail by IconoTech users who have no personal e-mail declared in the database. If you don't want that users without e-mail can send messages, leave this field empty.

Then, you can test your parameters by using the button *Send a mail to test*. Iconotech is going to send an e-mail to the default e-mail by making a connection to the server defined by using the access name you have entered.

If you do not know the right parameters, you can continue and enter later the correct values by going in the *Preferences* module.



The bottom of the page shows the DICOM receiver parameters. The receiver (IconoSCP.exe) is controlled by IconoTech and cannot be launched independently except if you have bought a license.

Print the parameters to enter them in the various DICOM equipment connected to the same network.

You can launch right now the DICOM receiver by clicking on the button «Launch the DICOM receiver». Few seconds later a green circle will appear in the task bar.

The DICOM receiver will be launched automatically together with IconoTech, except if you cancel this option in the “Preferences” module.

## Overview of IconoTech

### Discovering IconoTech

The main page allows you to access to the « Preferences » module or to view the teaching files.

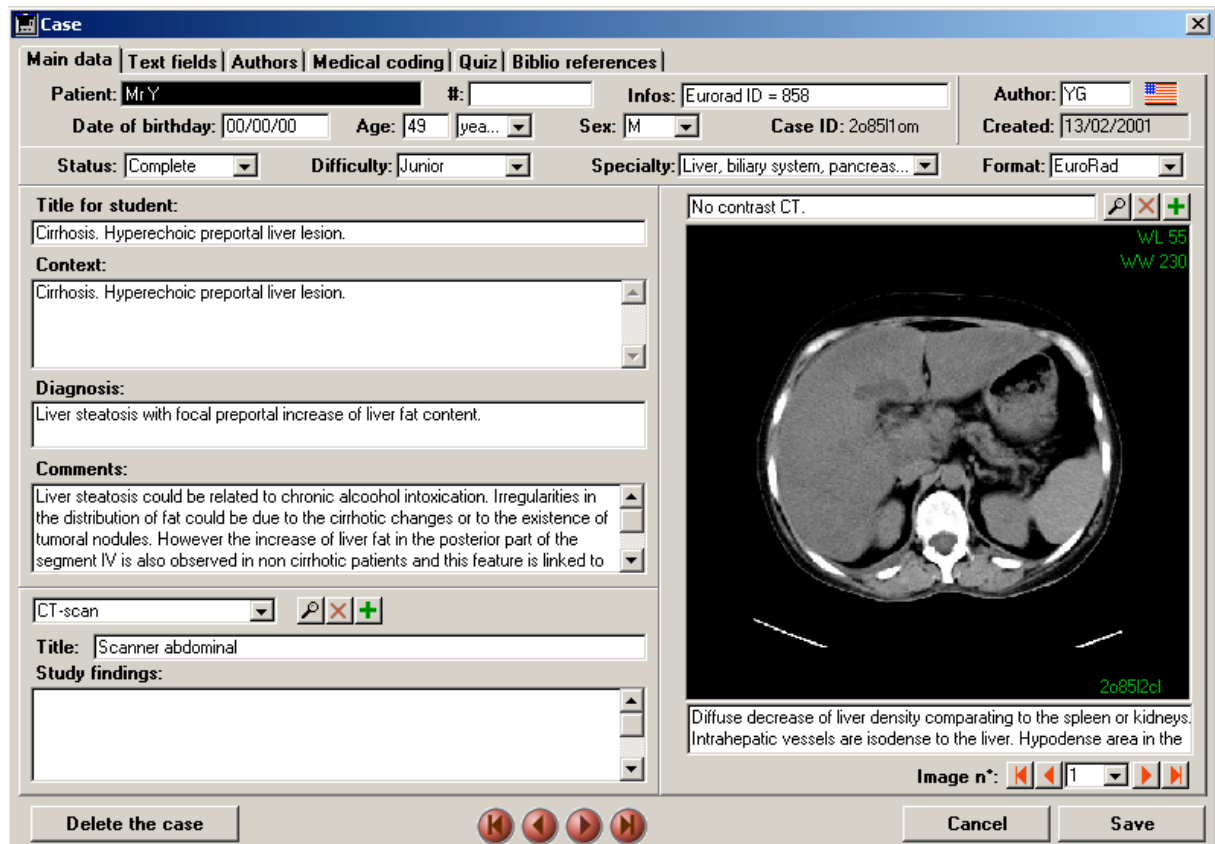


By clicking on the *Clinical cases* button you get the list of teaching files contained in the database. To sort the cases in a different manner you can click on the header of a column.

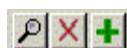
Age	Sex	Patient	Diagnosis	Specialty	Difficulty	Status	Author	Created
77 year	F	Mrs X	Duodenal perforation and acute pancreat	Liver, biliary tree, spleen pancreas	Junior	Complete	YG	22/02/01
49 year	M	Mr Y	Liver steatosis with focal preportal increas	Liver, biliary tree, spleen pancreas	Junior	Complete	YG	13/02/01

To access to a case, double-click on a line of the case list. In the author mode you will have access to all fields concerning a teaching file. The index placed at the top of the page allows to access to :

- a zoom on text fields, useful to type in a long text
- list of authors
- medical codes linked to the current case
- quiz module to attach one or several quiz to the case
- bibliographic references linked to the case.



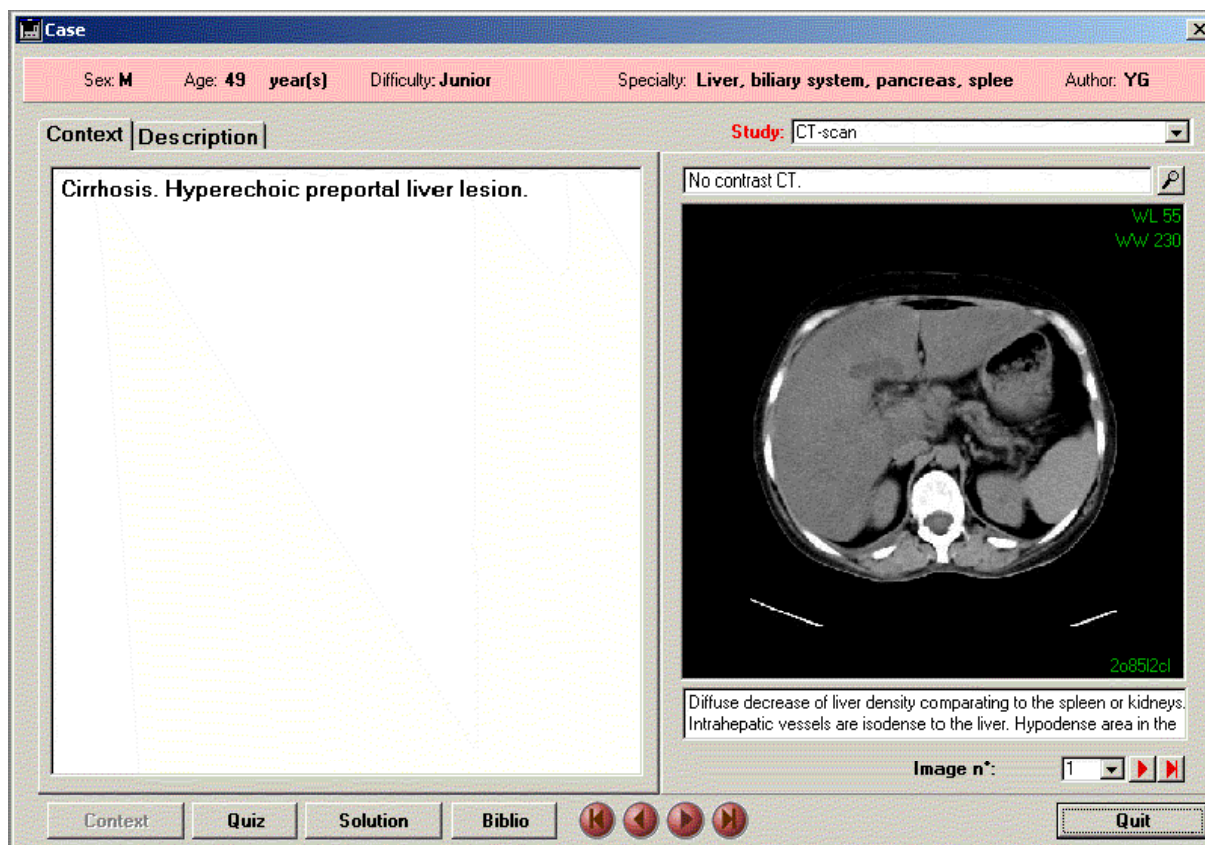
Three small buttons are frequently placed near object or list :



- the magnifying glass allows to have more information, to change the object value, or to view an image in a full screen mode.
- the red cross is use to delete the object selected
- and the green plus allows to add a new object.

The floating window tool give an access to various functions : show all cases, sort the cases, define or view a selection, view images using a grid, multicriteria query, merge two cases or duplicate a case, export module, import a case or a DICOM image, add a new case, delete a case or a selection of cases. These functions are described in the *Window tool* chapter. Other functions are also available in the GOLD version.

Using the *Access* menu (in the menu bar) you can define the viewing mode. The *Author* mode allows to modify existing teaching files using an appropriate user interface (cf. supra). The *Consultation* mode allows to visualize teaching file using two steps : a first step without knowledge of the diagnosis, and a second step with the diagnosis, the discussion and the references.



In the same *Access* menu you can change the current user. This line has the same effect that the *Change User* button on the main page. Only users who have the administrator or author rights can access to the author mode or can view the name of the patients.

### ***Build my first case***

If you have the author profile, you can build a case by using the button *Add a case* which is in the window tool. To add an image you have to click on the *Add an image* button which is located at the top of the image area and can be easily recognized by the green plus sign. You have first to define a study in which you want to place the image. Then you will have to select the image file you want to open. The software is optimized for DICOM images but is also able to manage JPEG, BMP or PICT image files.

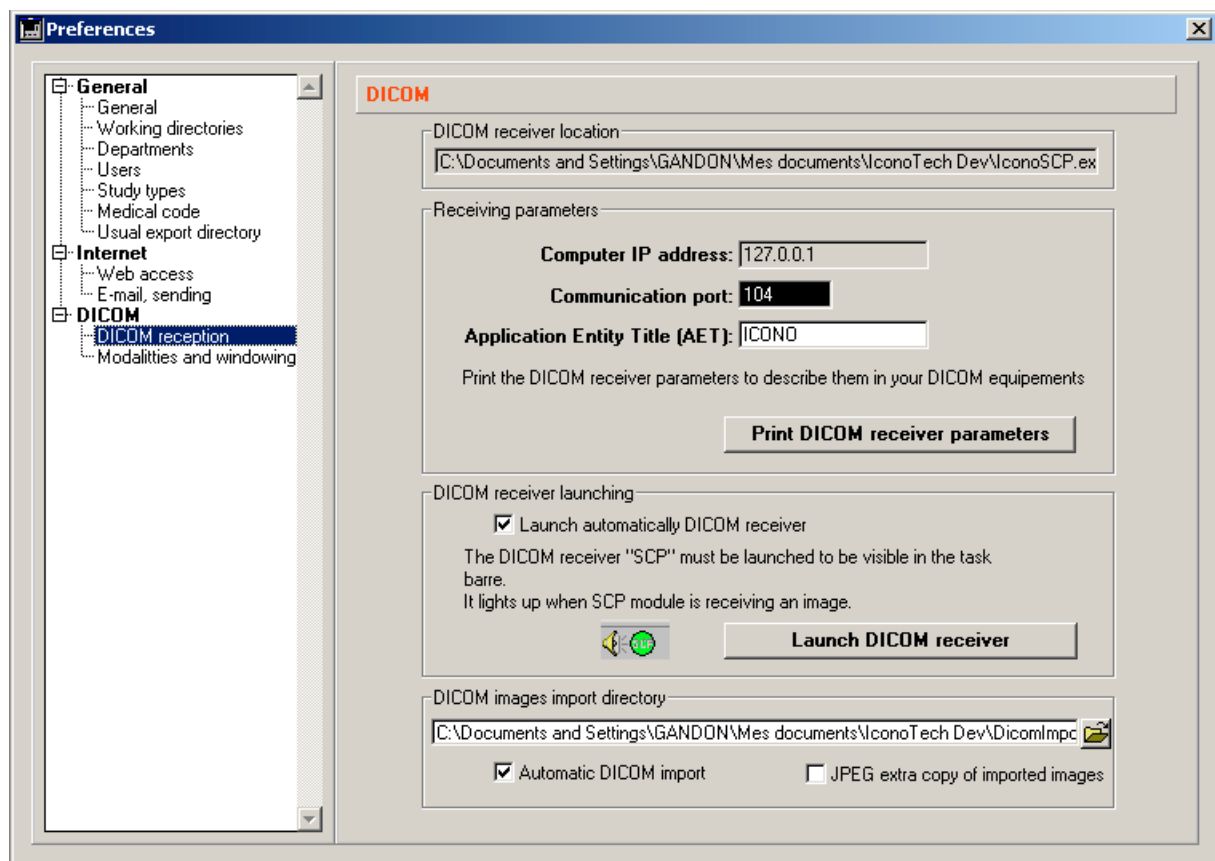
The purpose of this software is to be integrated in a DICOM network and usually cases are created automatically when a new image DICOM is received (cf. infra).

## Build a case in a DICOM environment

The main interest of IconoTech software is to be used in a DICOM environment.

First check the IconoTech parameters by clicking on the button *Preferences* (or by the menu *Administration/Preferences*). This button is masked if you are not declared as administrator of the database. In the *Preferences* module select the *DICOM reception* index to view the parameters. Print the parameters and ask to technicians who are in charge of DICOM equipments to declare the IconoTech software as a Store SCP DICOM client. This is usually easier to do on workstation than on imaging sources.

Images sent will be placed automatically in the *DICOM Import* directory defined in the *Preferences* module. The reception of DICOM images is blocked in the demo version when there is 10 cases in the database.



Check the green circle « SCP » is correctly seen at the right of the task bar (in the service tray). It is becoming brighter during image reception.

When IconoTech client is declared in your DICOM equipment you can select an image and push it to IconoTech. A new case will be created containing the image. To see the case, you have to open the case list by clicking on the button *Clinical cases* on the main screen. If you are already viewing the case list, to update the list, click on the second button *Show all cases* in the window tool. The new case is at the top of the list (except if you have send a new image in a previous case). All images of the same study are put together in the same case, in the same study. Images of the same patient but coming from two different studies can be either put in the same case in another study if there is a correct patient ID in the DICOM header,

either put in another new case and you have to use the *Merge* button in the window tool to group the two studies in the same case.



If you do not succeed check that the two computers are on a same subnet (only the last term of the IP address is different and the mask is the same) or that the gateway is properly defined.

### **Export / Import a case**

You can easily export a case by selecting one or several cases on the case list and by clicking on the export button on the window tool. Then you have to select the export content, the export format and the export directory. Usual directories can be easily defined in the *Preferences* module. To export a case to another IconoTech database, choose *Case + Images* and select *XML* format for the text fields.

You can import a case created by a software which are using a similar XML export file, for example from another IconoTech database. To import a case you need to put together, in the same directory, the XML file and the images belonging to the case. The import could be manual, by clicking on the *Import* button on the window tool. If you have bought a license, you can also launch an automatic import process which is going to import cases received in the *Case Import* directory. This allows an automatic exchange between two databases.

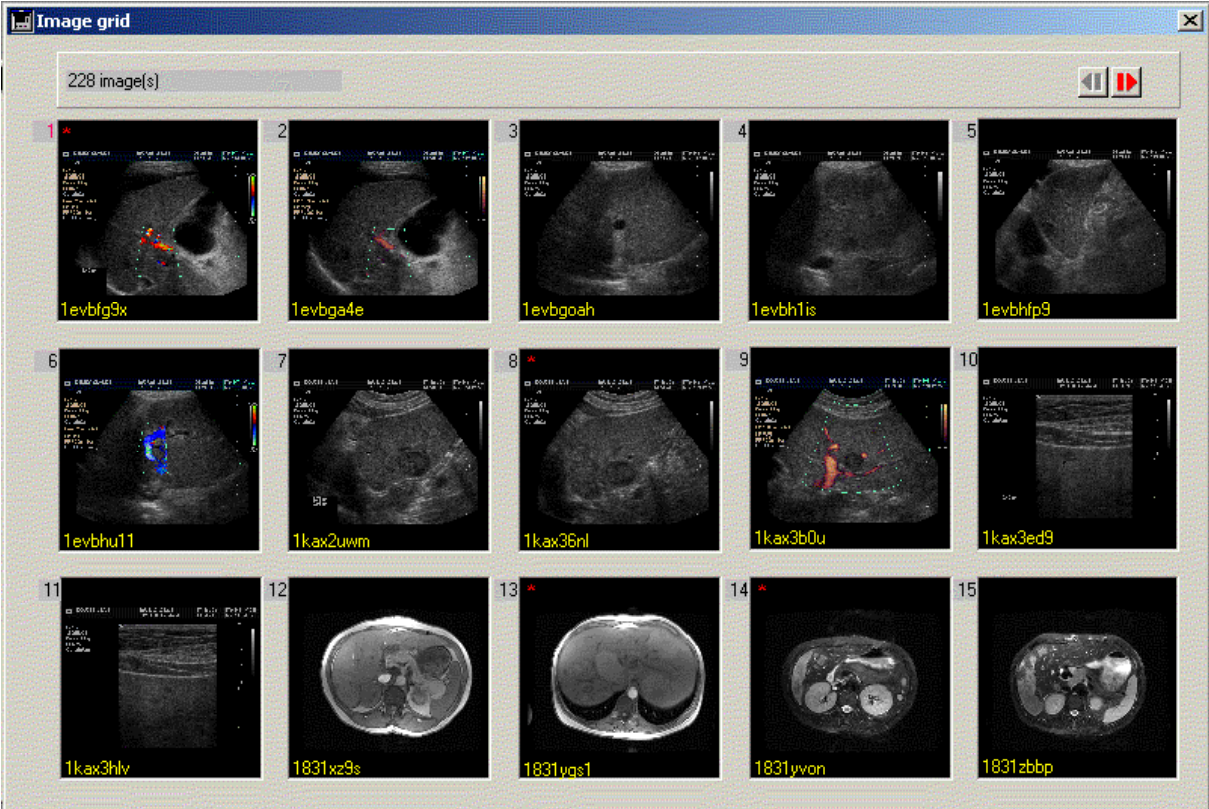
### **Select images to prepare an electronic presentation**

First, you probably need to search teaching files which contains the type of image you want to use for your talk or paper. The easiest way is to launch a full-text search using the Text field but you can combine all criteria to reduce the number of cases found.

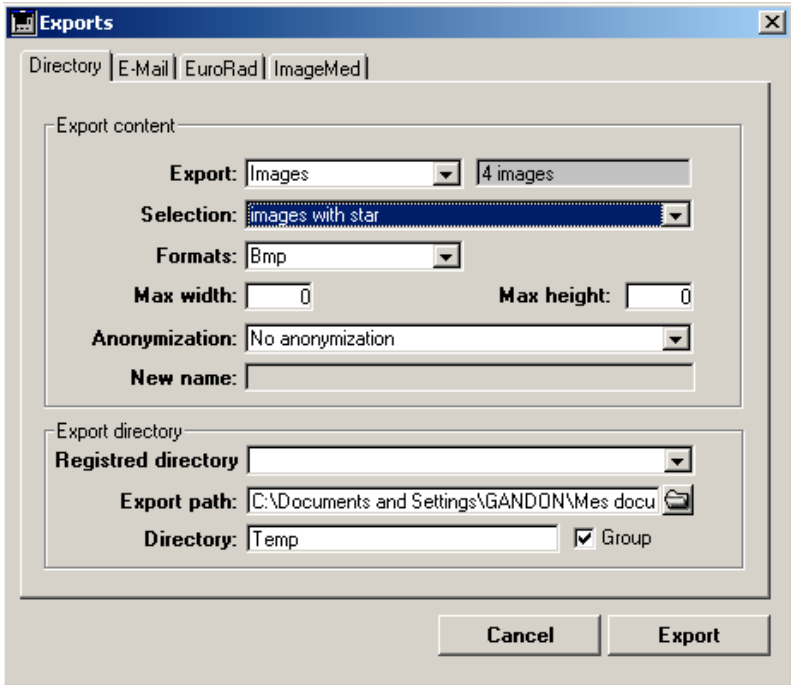
The result is a list of case but you can easily browse the images by clicking on the *View image grid* button in the window tool.

Then it is possible to select images from different cases in order to create a subselection. You just have to click on the left upper corner of an image an a red star appears. If you click on the


star, the image is withdrawn from the selection and the star disappears. This selection can be done on all type of image format : within a case, on a thumbnail within a grid, or on a full screen.



This selection can be export (button *Export* in the window tool) or archived (button *Selection* in the window tool).



Using the export module you can select a specific format (BMP, PICT, GIF, JPEG), reduce the size of the image, put a dark rectangle to anonymize the image, and define the export directory. By default the software creates a directory by case to organize the export but you can cancel this grouping option. If you have create BMP images it is easy to import these images in a presentation software.



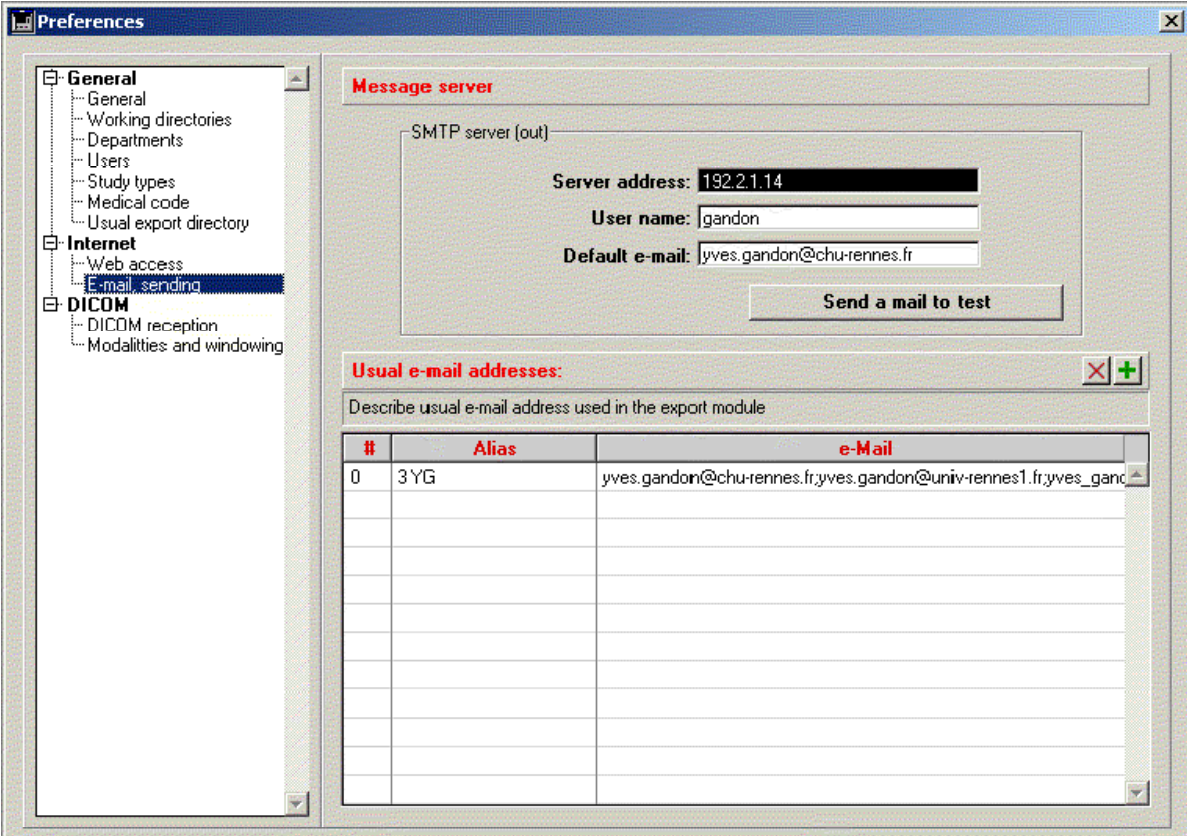
The current selection is lost when you quit IconoTech. You can archive the current selection by clicking on the *Selection* button in the window tool.

### Send images using e-mail

It is possible to export images (the current image, all the images of the current case, selected images with star) or cases to a colleague using e-mail.

First, be sure that the access to your e-mail SMTP server is correctly defined in the *Preferences* module, in the E-mail section. Of course, you need to have a reachable SMTP server and to know the following parameters :

- *Server address* : IP address or host name of your SMTP server. It is usually a server which is inside your local network. If you access to internet by modem ask to your provider the name of the SMTP server and your access name. You can also reach a SMTP server through a proxy if you describe the proxy parameters in the *Web access* section of the *Preferences* module.



The screenshot shows the 'Preferences' dialog box with the 'E-mail sending' section selected in the left-hand tree. The main area is titled 'Message server' and contains the following fields:

- SMTP server (out):
  - Server address: 192.2.1.14
  - User name: gandon
  - Default e-mail: yves.gandon@chu-rennes.fr
- Send a mail to test button

Below this is the 'Usual e-mail addresses' section, which includes a table for defining email aliases:

#	Alias	e-Mail
0	3YG	yves.gandon@chu-rennes.fr,yves.gandon@univ-rennes1.fr,yves_ganc

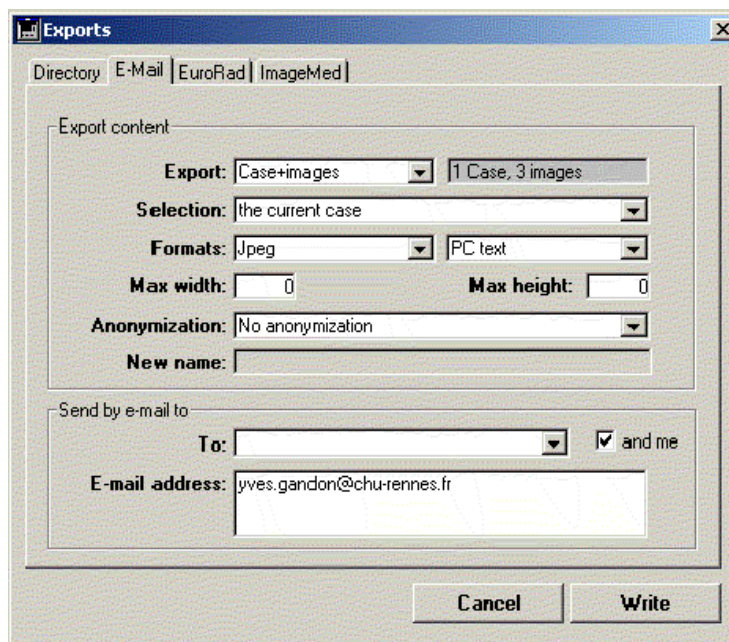
- *User name* : the name which allows you to access the e-mail server, usually defined by your network administrator.
- *Default e-mail*: It is the default value which is going to be used to send e-mail by IconoTech users who have no personal e-mail declared in the database. If you don't want that users without e-mail can send messages, leave this field empty.

Then, you can test your parameters by using the button *Send a mail to test*. Iconotech is going to send an e-mail to the default e-mail by making a connection to the server defined by using the access name you have entered.

In the same window you can also declare your usual contacts.

Then, quit the *Preferences*, click on a case in the case list, click on the *Export* button in the window tool and select the E-mail index. Select the export parameters :

- type of export : images, cases, or both
- content of export : for example, if you have previously selected Images, All images of the current case
- export format : JPEG by default (it gives a good image quality for the smallest size of file)
- type the e-mail address.



Then click on the *Write* button to prepare your message and send it. IconoTech take in account the current user to define the e-mail sender. Be sure that the automatic signature of the e-mail is correct before sending it. If the current user has no e-mail defined in its record, IconoTech is going to use the default e-mail defined in the *E-mail* section of the *Preferences* module.



IconoTech is not design to manage e-mail history ! There is no trace of previous e-mail. To be sure that the e-mail is correctly sent maintain the option *and me* ! You will receive a copy of the e-mail sent in your usual e-mail software.

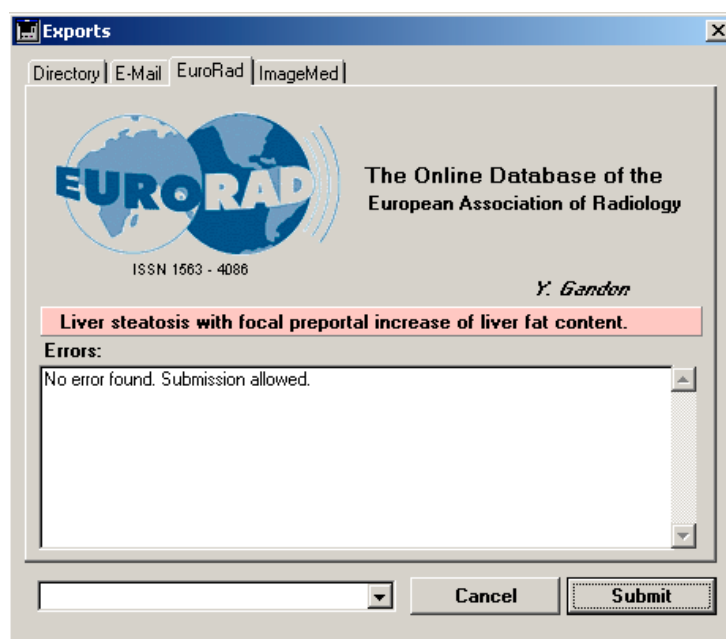
### **Submit a case to EuroRad**

EuroRad is a peer-reviewed online database containing educational and research teaching files ([www.euroRad.org](http://www.euroRad.org)). You can submit teaching files online but you can also use IconoTech to collect images and, when the case is complete, to submit it.

Right now study findings are not integrated in EuroRad cases. Technical data and image description are concatenated.

You need to respect EuroRad author guidelines :

- case written in English
- the number of authors is limited to 5
- main (= first) author coordinates correctly described
- a maximum of 16 images in a maximum of 8 studies
- ACR codes (minimum 1, maximum 3)
- MeSH codes (minimum 1, maximum 3)
- the number of references is limited to 5



If you want to submit a complete case, click on the Export button of the window tool and select the EuroRad index at the top of the window.






The software checks the content of the case and show the result in a specific window. If there is no error the submit button is active and the case can be submitted by e-mail.








Submission to EuroRad is done by e-mail. So be sure that you have properly configure the access to your e-mail SMTP server. IconoTech will send a copy of this e-mail in your mail box.

## Window tools

### Functions overview

Icon	Function
	<p><b>Search</b></p> <p>This function give access to the multicriteria query module. This module allows to search teaching files by : creation or modification date, patient age, subspecialties, level of difficulties, content of text fields, type of imaging study, keywords... A Boolean function allows to search in the whole database, in the previous selection and even to add to the previous selection or withdrawn from the previous selection.</p>
	<p><b>Show all cases</b></p> <p>This function show all the cases contained in the database and sort the cases using the creation date value, the most recent cases being at the top of the list.</p>
	<p><b>Sort</b></p> <p>This function sort the case list using various criteria and is similar to a click on the header of case list.</p>
	<p><b>Selections</b></p> <p>This button give access to a contextual menu which offers :</p> <ul style="list-style-type: none"><li>- to record a new selection containing the images on which a star was placed by a click on the upper left corner of the image,</li><li>- to add images selected by stars to a previous recorder selection,</li><li>- to find a recorded selection,</li><li>- to reset the current selection by deleting all the stars placed on images.</li></ul>
	<p><b>Image grid</b></p> <p>A click on this button show images of the current case or all images of the case list in a grid mode (4x3 thumbnails). A double-click on a thumbnail shows the image in a full screen format. Then you can navigate in the image stack using the arrows key.</p>

Icon	Function
	<p><b>Duplicate a case or merge two cases</b></p> <p>If you have selected a single line this button allows you to duplicate a case and associated images.</p> <p>If you have selected two lines (using ctrl-click) this button will open a merging window.</p>
	<p><b>Export</b></p> <p>This is a major function allowing export of images (or full cases) in a directory or by e-mail. Using this function you can for example :</p> <ul style="list-style-type: none"> <li>- export selected images in a BMP format to placed them on an electronic presentation,</li> <li>- export cases with images in a DICOM format to an other database,</li> <li>- send images in a JPEG format by e-mail to a list of colleagues,</li> <li>- submit a case to international databases such as Eurorad.</li> </ul>
	<p><b>Import</b></p> <p>This function allows manual import of</p> <ul style="list-style-type: none"> <li>- a case which are at the XML IconoTech format,</li> <li>- or a DICOM image.</li> </ul> <p>It could be used to retrieve a deleted case which was move to the <i>Deleted</i> directory in the <i>IconoTech</i> directory.</p>
	<p><b>Add a case</b></p> <p>It creates a new case which is automatically open in an author mode.</p>
	<p><b>Delete cases</b></p> <p>It allows an author to delete the current teaching file or a selection of teaching files if you are viewing the case list and if you have selected one or several lines (selection of several lines obeys to Windows rules).</p>

Depending on the current user profile (Administration, Author, Consultation), buttons can be active or inactive. Functions can also be dependent on the current context.

## FAQ and troubleshooting

### ***I am blocked and the cursor is transformed in a small page icon.***

It happens when you click on a background window which then covers the current window. Press the **Escape** key.

### ***How to retrieve a case deleted ?***

The case was move to the *Deleted* directory which is included in the *IconoTech* directory. Use the *Import* button (in the window tool) to retrieve the case by selecting the corresponding XML file.

### ***How to duplicate a case to create an English version ?***

Select the case in the case list and click on the *Merge / Duplicate* button in the window tool.

### ***How to put in the same case two studies placed in two different cases ?***

Select the two cases (using ctrl-click) in the case list and click on the *Merge / Duplicate* button in the window tool.

### ***How to view easily images in a full screen mode ?***

Double-click on an image or a thumbnail. Then you can change images by pressing the arrow keys (up or down). To exit double-click on the image or press the escape key.

### ***How to view a grid of images ?***

by pressing the Ctrl-P keys.

### ***How to rearrange the place of images ?***

When you are viewing a case in an author mode you can open an image grid by Ctrl-P or by clicking on the Image grid button in the window tool. Then do a Ctrl-click on the image you want to move and a drag and drop this image at its new place. Use the same technique to move the studies.

### ***May I create my own medical coding system ?***

Yes, you can add a new thesaurus in the *Medical coding* section of the *Preferences* module.

### ***May I combine DICOM images and JPEG images in the same case ?***

Yes, you can add JPEG images in the same study or create a new study and place it the images.

### ***May I protect my database by a password ?***

Yes, you can define in the General section of the Preferences module the default user. If you select *None*, IconoTech will open a blocking user selection window at launching. If you want

that this window appears after a defined inaction time, precise this value in the corresponding field.

### ***May I create my own medical coding system ?***

Yes, you can add a new thesaurus in the *Medical coding* section of the *Preferences* module.

### ***May I have several databases ?***

If you want to have several active databases with more than 10 cases, you will need several licenses. Then, you can exchange cases between databases by exporting one or several cases to a pre-defined export directory. This directory is automatically browse by the other database which integrates the cases exported.

### ***What happens when I import a case already existing ?***

The case is replaced by the new version without confirmation. So, be carefull before importing a case. However, this function can be used for example by a resident to export a case to a demo database at home, to update the case and to reintegrate the updated XML file in the main database (it is not mandatory to import images).

### ***May I anonymize images automatically after reception ?***

Yes, use the *Dicom modality* section in the *Preferences* module. You can define, modality by modality, the anonymization parameters. You can also decide to transform DICOM images in JPEG and even to reduce the size of the image. The default windowing parameter is defined in the same page.

### ***May I change the default DICOM windowing parameters ?***

Yes, use the *Dicom modality* section in the *Preferences* module. You can define, modality by modality, the presets values. You can also define the default preset used during DICOM import.

### ***May I change the windowing parameters interactively using the mouse ?***

No, it is not available in this first version of the software.

### ***May I flip the image ?***

No, it is not available in this first version of the software.

### ***How to secure my database ?***

By frequently copying on a CD or through the network the database (*IconoTech.4DD*) and the *Images* directory.

### ***How to retrieve a corrupted database ?***

You can use the *4D Util 6.5* which is part of the 4<sup>th</sup> Dimension tools (4D, France). You can also open the demo database and integrate manually (or automatically if you have a license) the XML files contained in the *Image* directory.

### ***May I use several disks to store images ?***

Yes. By using the *Administration* menu you can index in the database the images which are contained in an extra-disk. For example, if your disk is full, you can add a new disk and open a new *Images* directory. Then you have to declare this new directory as the default directory to store new cases in the *Working directories* section of the *Preferences* module. Then you have to browse the old *Images* directory and index it as an extra-disk. You can do the same operation with a CD.