RadPlanBio Desktop Client - User Documentation

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1 Overview of RadPlanBio

The RadPlanBio platform is a web-based solution for exchanging and sharing cancer treatment research data in order to allow large scale multi-centre trials. The idea is to deliver a study management and electronic data capture system with special extensions dedicated to safe upload of medical DICOM files.

RadPlanBio desktop client is one component of RadPlanBio platform, which main purpose is to provide local DICOM data pseudonymisation and secure data upload functionality. It also links the uploaded data to subjects registered in RadPlanBio.

The usage of the software is quite straightforward and the complete work-flow of this process is described in following section.

2 Getting Started with RadPlanBio desktop client

This section explains how to use RadPlanBio desktop client to upload DICOM study data and associate them with subject taking part in RadPlanBio clinical trial.

2.1 Start the client

To start the application you have to open the executable file with name **RadPlanBio-client**. The client is using a configuration file **radplanbio-client.cfg**, which describe the connection details necessary to enable communication with RadPlanBio server. The configuration of client should be modified by your local IT administrator.
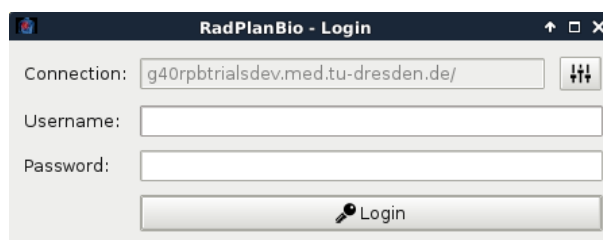

Figure 1: RadPlanBio desktop client login.

2.2 Log In to RadPlanBio

The login dialogue, Fig. 1 is automatically shown after the start of application. Please provide the same login credentials as you are using to access the RadPlanBio portal web application.

2.3 Main Menu

After the successful authentication the user is allowed to work with the application itself. The Fig. 2 shows the main interface of the client. The highlighted part are:

- Connection string: information about the user name and RadPlanBio server where the user is connected.

- Menu button: the button which will navigate user to the upload DICOM data module.
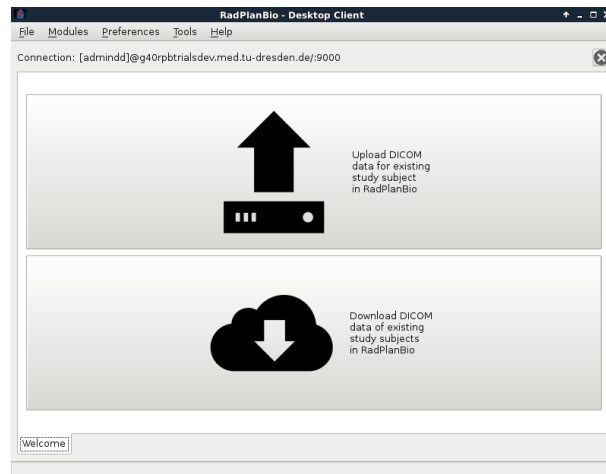

Figure 2: RadPlanBio desktop main interface.

2.4 Upload DICOM Module

Upload DICOM module is activated after clicking on the appropriate button from main interface, see Fig. 3. This module provides the possibility to browse through RadPlanBio study/subject/event object hierarchy. This allows user to find the correct study/subject/event to which the medical imaging DICOM data should be attached.
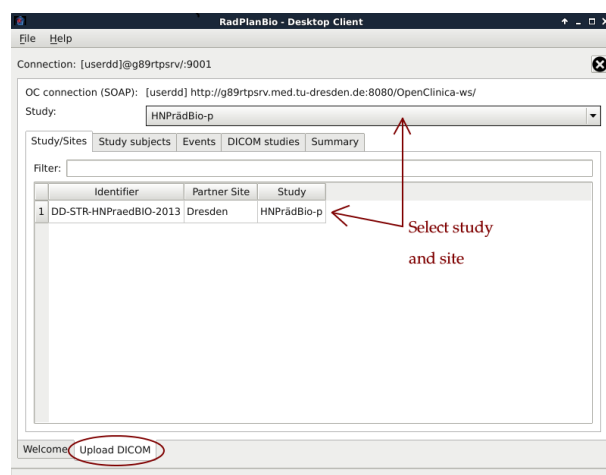

Figure 3: RadPlanBio desktop upload DICOM module, study selection.

After choosing the study/site the user can choose the study subject, Fig. 4. Study subjects in RadPlanBio are pseudonymised, it means that normally the identity of the patient is hidden behind the patient's PID (pseudonym). In case the patient is taking part in more than one clinical trials his PID should remain the same. Additional to PID identificator, each subject has Subject Study ID number which has nothing to do with the identity, but rather identifies

the subject within one clinical trial.

Note: if the person using the client knows only identity of the patient and needs to found out the associated PID, it is necessary to login into RadPlanBio portal which provided the function to search PID of registered patient according to his identity (this feature in only available for partner sites using RadPlanBio integrated patient identity database).
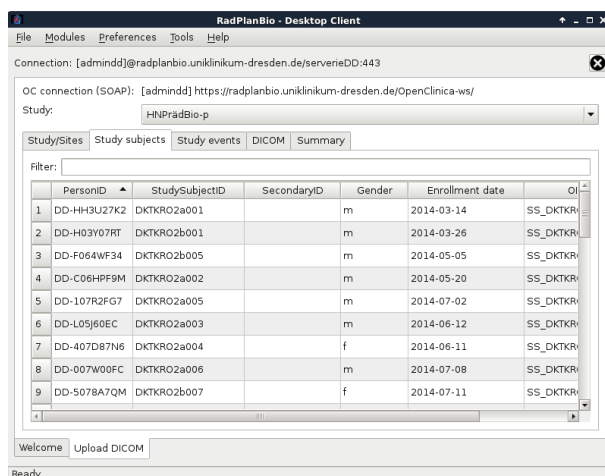

Figure 4: RadPlanBio desktop upload DICOM module, subject selection.

Next step is selection of appropriate study event where DICOM data should be assigned to, Fig. 5. Data collection in RadPlanBio is separated into study events. Study event represents the time point in running study, when certain data are collected and documented. Every such event can contain one or more CRFs. Events which are collecting DICOM data have special purpose DICOM CRF. Data for this CRF are not enter manually via data entry personnel, but rather automatically imported via RadPlanBio desktop client during an image upload. Only those events will be visible for selected study subject, which have been already scheduled in RadPlanBio.
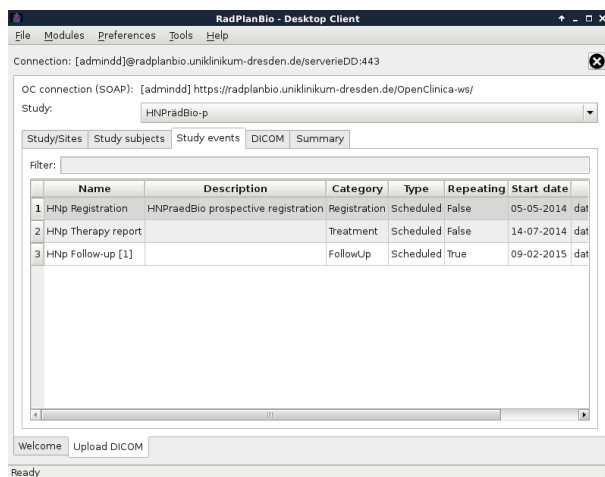

Figure 5: RadPlanBio desktop upload DICOM module, event selection.

The last step necessary for linking DICOM data to CRF study data is selection of DICOM CRF item field which will be used to store the link to uploaded DICOM study, see Fig. 6. The data fields in DICOM CRF also define what type of imaging modalities are going to be stored for certain clinical trail (e.g. diagnostic CT, treatment plan, etc.). Fields are designed to archive two important DICOM tag values which can be afterwards used to locate the DICOM data in PACS server:

- DICOM patient ID: patient ID tag in original DICOM data will by replaced (pseudonymise) with PID of selected subject in RadPlanBio automatically.

- DICOM study UID: study UID tag in original DICOM data will be replaced with randomly generated number in order anonymise it.

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In case the user is uploading additional DICOM study, he will see that **Field value** in data table will be not empty, rather it will have DICOM study UIDs randomly generated and uploaded in the past.
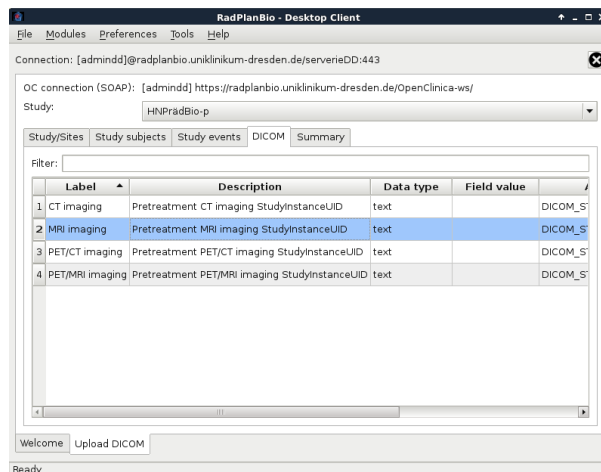

Figure 6: RadPlanBio desktop upload DICOM module, CRF item selection.

2.4.1 DICOM Data Manipulation

Finally we come to the point where the link between DICOM and clinical data is uniquely specified and what remains it to deal with DICOM data pseudonymisation and final upload. In order to do this, the user has to specify the path where the software should look for DICOM study. This is done via clicking on **Upload DICOM data** button as it is highlighted in Fig. 7.
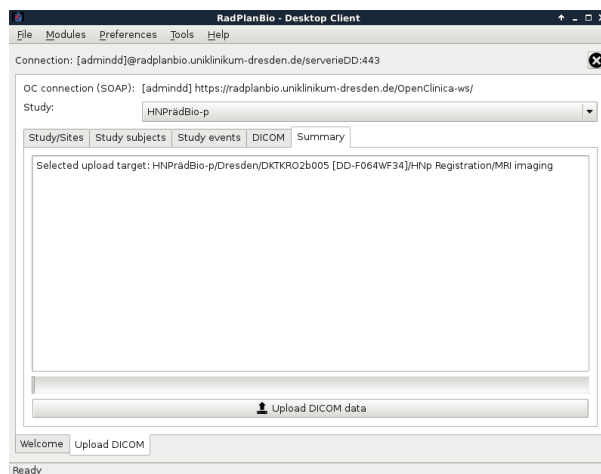

Figure 7: RadPlanBio desktop upload DICOM module

The dialogue is shown and the user has to navigate to folder in the file system with DICOM study which he wants to upload. Client automatically scan the path (including sub-folders) and displays the structure of provided DICOM data set in DICOM study/series tree view (DICOM browser, see Fig. 8). Here the user can restrict which parts of DICOM will be included for further processing (pseudonymisation and upload). The RadPlanBio can upload an associate imaging data within one study per upload procedure. This is the reason why the tree view overview allows to select only one study node. In case there is a situation when you have data which belongs together but have been for whatever reason stored in separate DICOM studies (e.g. planing CT in one study and treatment plans in separates studies), the DICOM browser will allow you to select the main study and add DICOM series from other studies in order to produce complete dataset where everything is in one study.

After this a data consistency check is done on selected DICOM structures. If there are uncertainties in underlying data set an error message is displayed in order to prevent the upload of inconsistent DICOM studies. If consistency check succeed, the dialogue describing how the DICOM study data are going to be pseudonymised is shown, see Fig. 9. Here the user have possibility to override the default behaviour, where study and series descriptions are removed during the pseudonymisation. In many cases it is usefully to keep this values, however the user has to prove
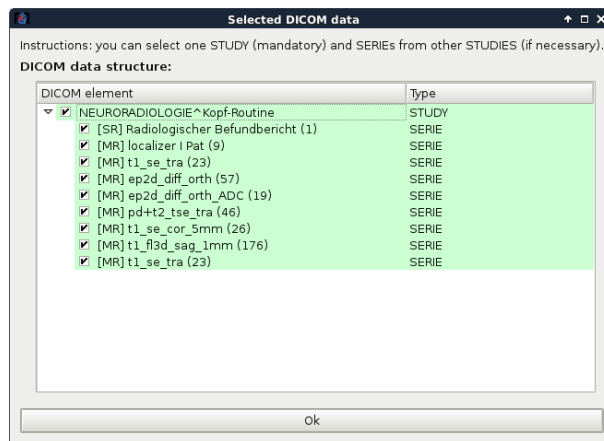
Figure 8: RadPlanBio DICOM browser

that they are no patient identity information stored in descriptions data fields or remove identity data if there are part of descriptions. In addition it is possible to view/modify and approve information extracted from StructuredReporting DICOM serie (if it is part of study). This approved report can be also uploaded tu study database.
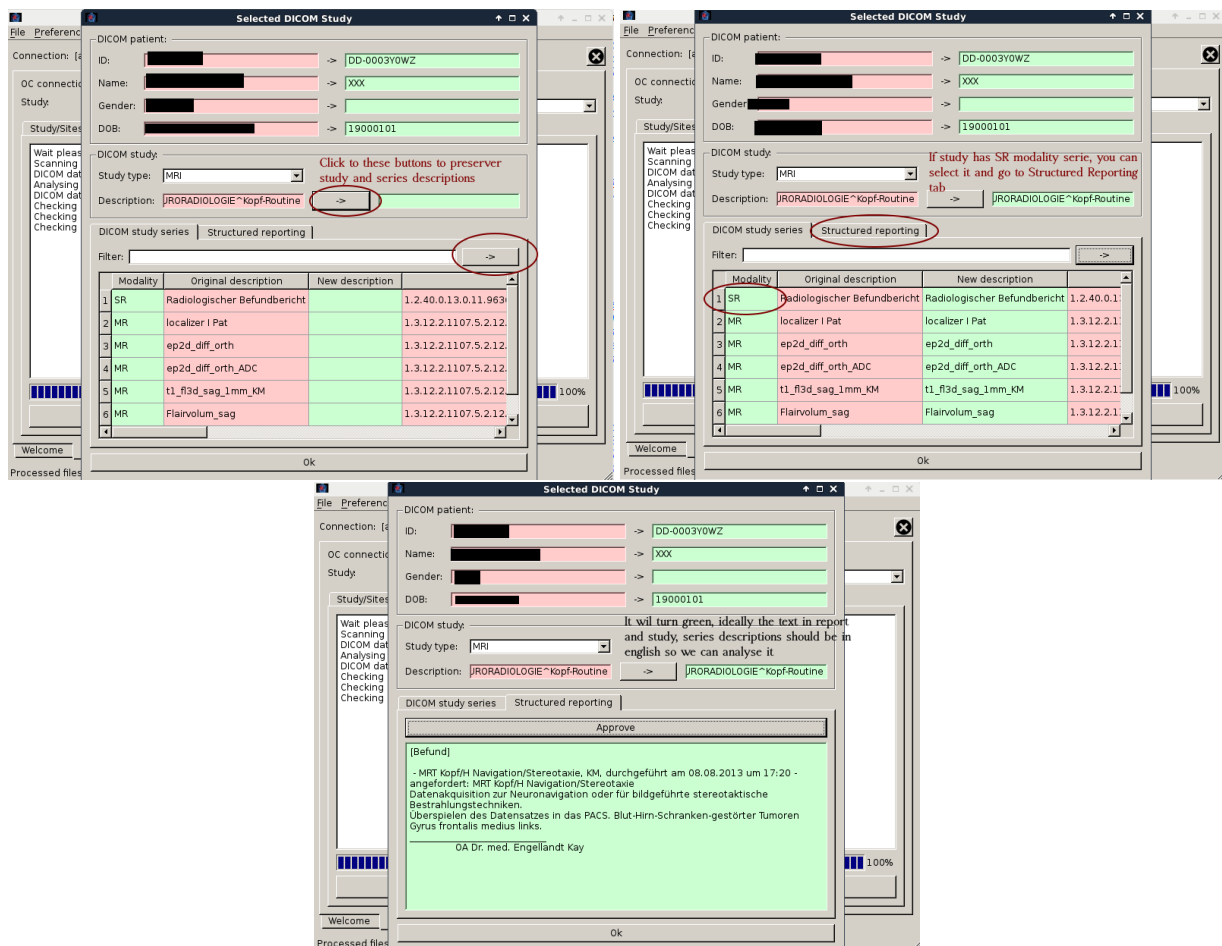

Figure 9: RadPlanBio DICOM study details

Afterwards this steps are performed:

1. In case of treatment plan, the user is asked to provide proper mapping for DICOM Structure sets. The software automatically preselect possible mapping options, see Fig. 10. Additionally for CTV, PTV, GTV it is possible to provide a short additional description. For dual organs it is allowed to specify left, right property. In case the contour is not relevatnt is should be marked as **Do not consider**.

Note: This mapping should be done carefully in order to ensure a good quality of data.

2. Software automatically pseudonymise the DICOM data and apply the ROI mapping to use assigned names for DICOM RT Structure sets.

3. Software starts with DICOM data upload into RadPlanBio research PACS.
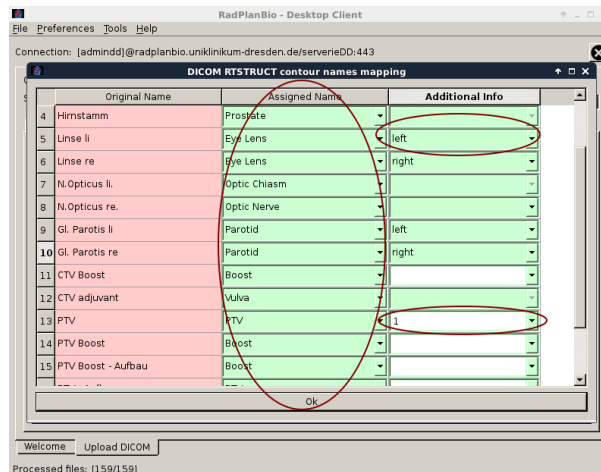

Figure 10: RadPlanBio desktop upload DICOM module, ROI mapping

During pseudonymisation and upload the system is reporting what is happening with the data as well as current progress, see Fig. 11. When everything ends well, the DICOM data link is stored in DICOM CRF and and DICOM data (stored in RadPlanBio research PACS) is available via RadPlanBio-portal web application.
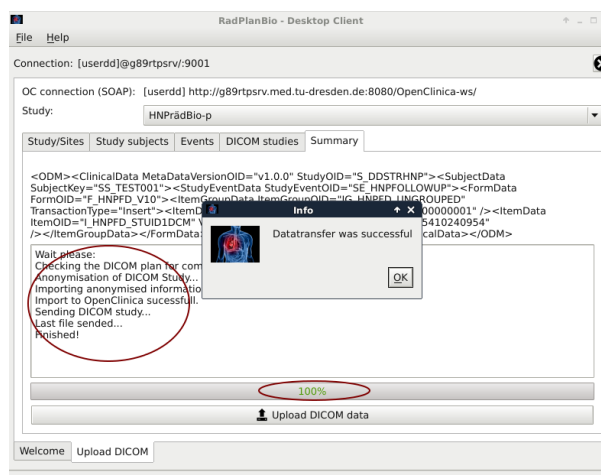

Figure 11: RadPlanBio desktop upload DICOM module, progress

3   Guidelines for export of DICOM data from existing systems

3.1   Oncentra Masterplan

In case it is necessary to export a complete treatment plan (with multiple RTPLAN series) the **Multicase export** feature of masterplan will do the job.

3.2   Conquest

Conquest (1.4.17 version) has the push to zip function which is an easy way of getting zipped DICOM study data via browser.