



Meteor Rheumatology Application

User Guide

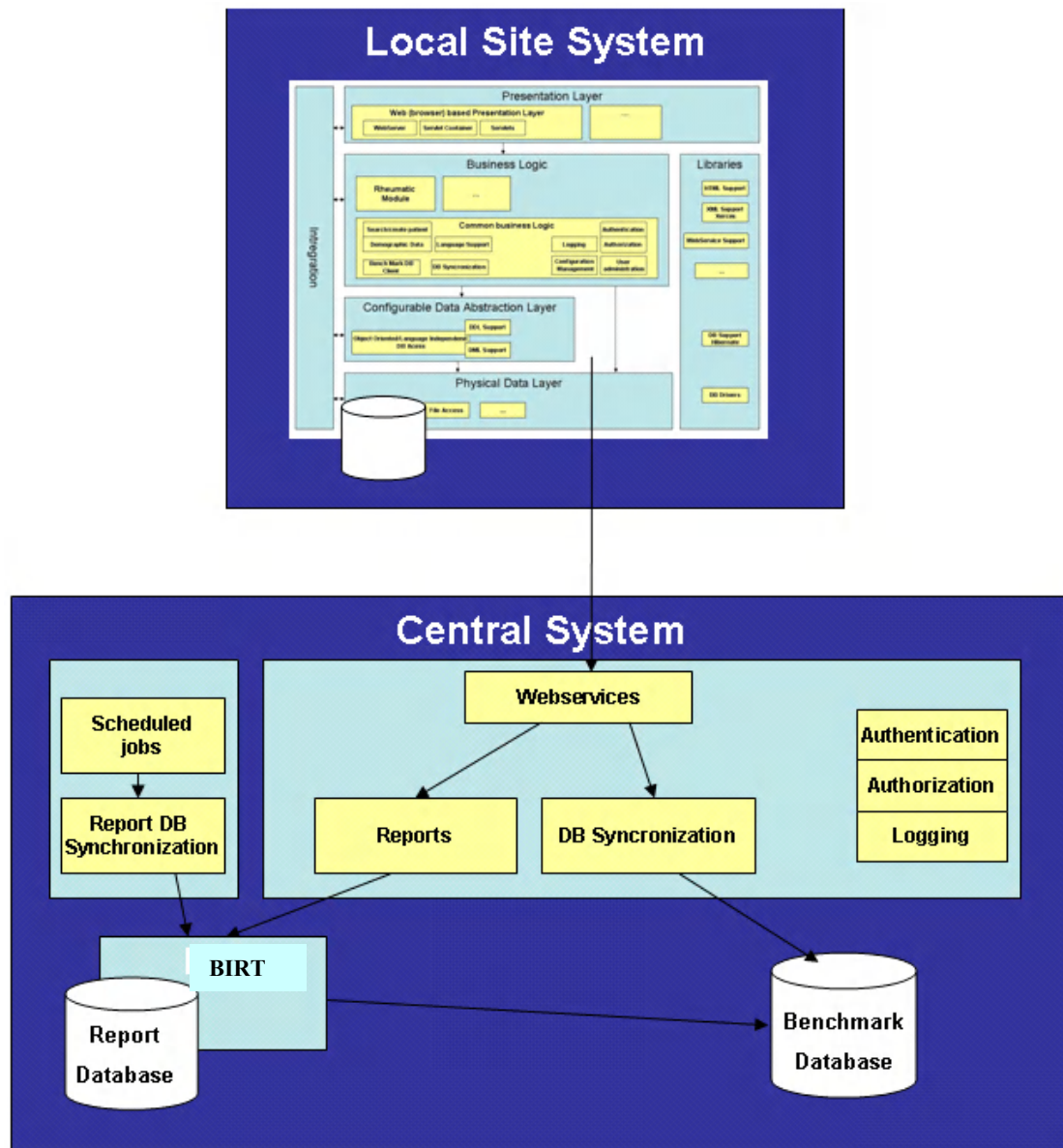
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1 Background

This document is intended to provide basic instruction and guidance for installing, administering and using the Meteor application. It is intended for use by system administrators and end users as a primary reference point.

The high level architecture for the Meteor Application is shown below:



2 Using the Application

2.1 Access the Meteor Application

The Meteor application can be accessed by entering the appropriate URL into the web browser:

<https://www.meteorapplication.com/central/application.html>

2.1.1: Access new site from the "site" menu in the application

The site can be selected from the drop down list, as indicated below.



2.1.2: Enter the username, password and encryption key* details

The username, password will be provided by the site administrator.

The encryption key is set by the administrator by typing in a chosen keyword – of at least 6 characters - in the encryption key field. This then becomes the key for all users at that site.

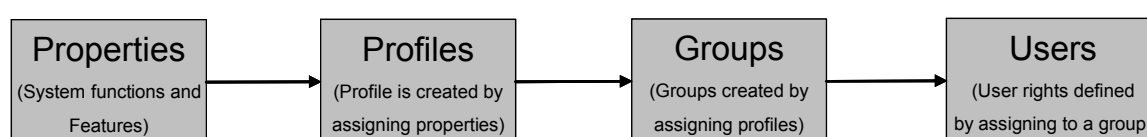
Note that the encryption key cannot be changed or updated. The site administrator should ensure that it is immediately noted and stored in a secure location.

Then click “ok” 33 times and you will get access to Meteor for the first time.

* The encryption key is only required for users who are running the hosted (non-local) version of the application. This is required for the central application since the personal patient information is encrypted before it is sent to the server and must be decrypted using the key at each logon. This maintains anonymity of patient records held outside the hospital or clinic.

2.2 Creating new users and groups

The **administrator** can create new users, groups and profiles to provide an efficient way of administering the system. This is performed using a hierarchical inheritance of defined properties, as summarised in the schematic below:



When the administrator accesses the system for the first time, there are 5 default groups (administrators, synchronizers, patients, doctors and research nurses) at that site, in accordance with the anticipated users of the system and their permissions. If needed more groups and profiles can be added.

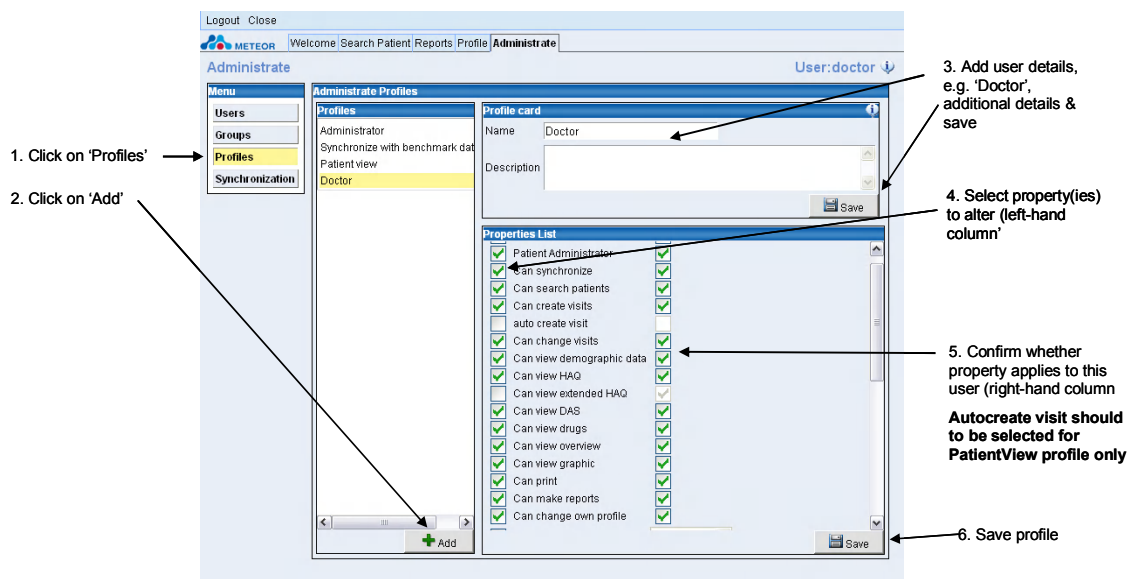
The properties available and the effect of applying the property are outlined below:

Profile Property List	Effect of Profile Property
Administrator	User can enter the administrator view and perform administrative tasks
Can search patients	When property is applied, user can search patients.
Can create visits	When property is applied, user can create visits
Can change visits	When property is applied, user can change data for previous visits, e.g. to add laboratory data or change other assessments
Autocreate visits	This property only to be used for patients. When applied, application automatically creates a visit when the user logs onto the application, so that the patient can enter HAQ data
Can view demographic data	When property is applied, user can view demographic data
Can view HAQ	When property is applied, user can view HAQ pages
Can view extended HAQ	When property is applied, user can view extended HAQ (can view pain slider) pages
Can view DAS	When property is applied, user can view DAS page
Can view drugs	When property is applied, user can view drugs page
Show Free Text	When property is applied, user can view Free Text
Can view overview	When property is applied, user can view overview page
Can view graphic	When property is applied, user can view graphics page

Can Edit/Print Doctors	When property is applied, user can Edit/Print patient data
Can print patient overview	When property is applied, user can print patient data
Can make reports	When property is applied, user can make reports in the reports database
Can change own profile	When property is applied, user can make changes to their viewing profile
Dasmodel	When property is applied, user can view the specified DAS model
Extended DAS model	When property is applied, user can view the extended DAS model
Show RAI	When property is applied, user can view the RAI score on DAS page
Show swollen count	When property is applied, user can view the swollen count score on DAS page
Show SDAI	When property is applied, user can view the SDAI score on DAS page
Show CDAI	When property is applied, user can view the CDAI score on DAS page
Show DAS(3)	When property is applied, user can view the DAS(3) score on DAS page
Show DAS(4)	When property is applied, user can view the DAS(4) score on DAS page
Show DAS28(3)	When property is applied, user can view the DAS28(3) score on DAS page
Show DAS28(4)	When property is applied, user can view the DAS28(4) score on DAS page
Graphics show SDAI	When property is applied, user can view the SDAI score on graphics page
Graphics show CDAI	When property is applied, user can view the CDAI score on graphics page
Graphics show DAS(3)	When property is applied, user can view the DAS(3) score on graphics page
Graphics show DAS(4)	When property is applied, user can view the DAS(4) score on graphics page
Graphics show DAS28(3)	When property is applied, user can view the DAS28(3) score on graphics page
Graphics show DAS28(4)	When property is applied, user can view the DAS28(4) score on graphics page

2.2.1 Adding properties

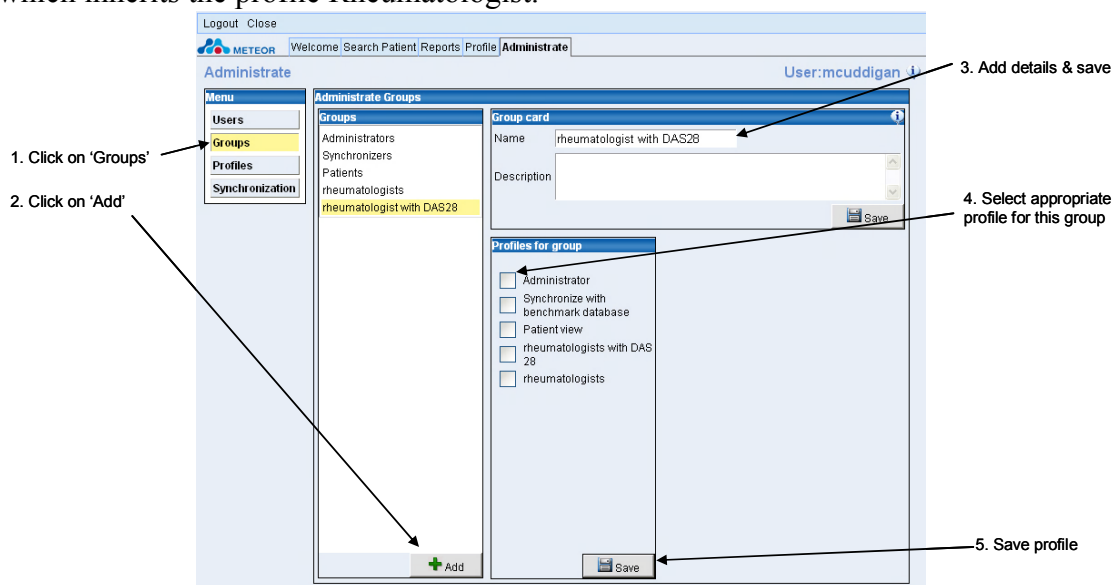
The properties are turned on and off using simple checkboxes, as shown in the diagram below.



The Meteor application is designed for use primarily for rheumatologists and research nurses. Rheumatologists should have access to all properties except for the ability to administer the application. Default the DAS 53/44 is set, but in the properties list you can change that to DAS 28. The profiles selected for nurses will depend on the role and workflow of each individual rheumatology department. In addition, there is the possibility to provide access for patients to enter data (for example) via a console in a waiting area.

2.2.2 Adding a new group

The diagram below illustrates how a new group called 'Rheumatologists' is created which inherits the profile Rheumatologist.



2.2.3 Adding a user to a group

This diagram shows how to add a new user and assign the user the privileges relevant to the group 'Rheumatologists'.

The screenshot shows the METEOR administrative interface. The 'Administrate' menu is open, and the 'Users' section is selected. A list of users is displayed, with a 'new' button highlighted. The 'User card' form is visible, containing fields for Login name, Firstname, Lastname, Email, Home address, Organisation, Name, Unit name, Business category, Address, Employee, Title, Type, Description, Telephone, Mobile, Home phone, Fax, ID, and Room Nr. The 'Group membership' section shows a list of groups, with 'rheumatologists' selected. A 'Change Password' dialog box is open, showing fields for New Password and Repeat Password. Arrows point to the following steps:

1. Click on 'Users'
2. Click on 'Add'
3. Select the new group to which the user will belong
4. Add user details & save
5. Enter an initial password for the user, and make a note of it.
6. Save profile

It is strongly recommended that the user card is completed as fully as possible for all registered users. As a minimum, it is recommended that the Login Name, First Name and Last name should be considered as required fields.

The Login Name and Password should be noted since these must be provided to the user in order to allow the new user to access the system for the first time.

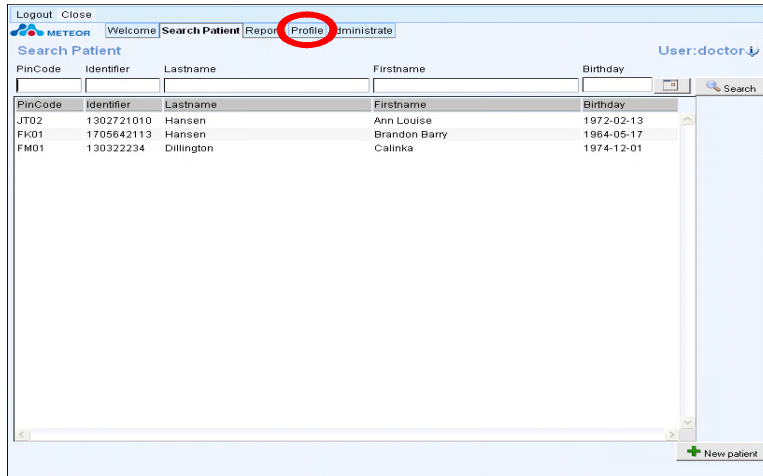
2.3 Profile and password changes

Users with the ability to edit their profile have the ability to modify the layout of the application.

2.3.1 Access the profile page

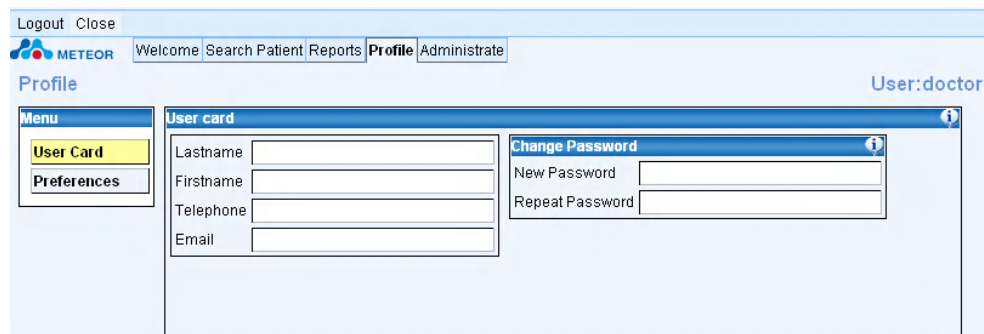
The profile settings are accessed from the navigation tabs in the application frame, as indicated below.

Users should click the profile tab to access the settings menu:

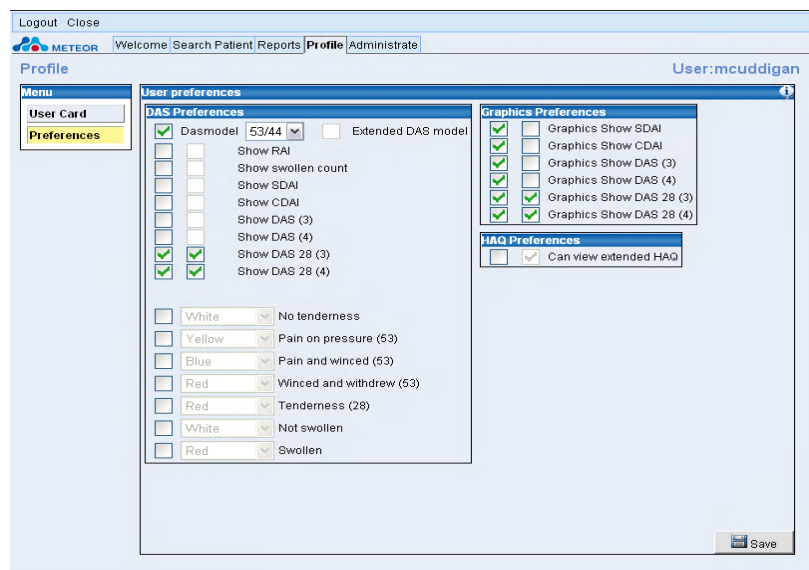


The screen below will appear - note that the user can change their access password from this screen, using the change password entry field.

Click the 'preferences' button, shown below:



The profile settings menu should then be displayed, as shown below. The user can choose to alter these settings. If no changes are made, the user will inherit a default profile for the appropriate group (e.g. doctors, research nurses, etc).

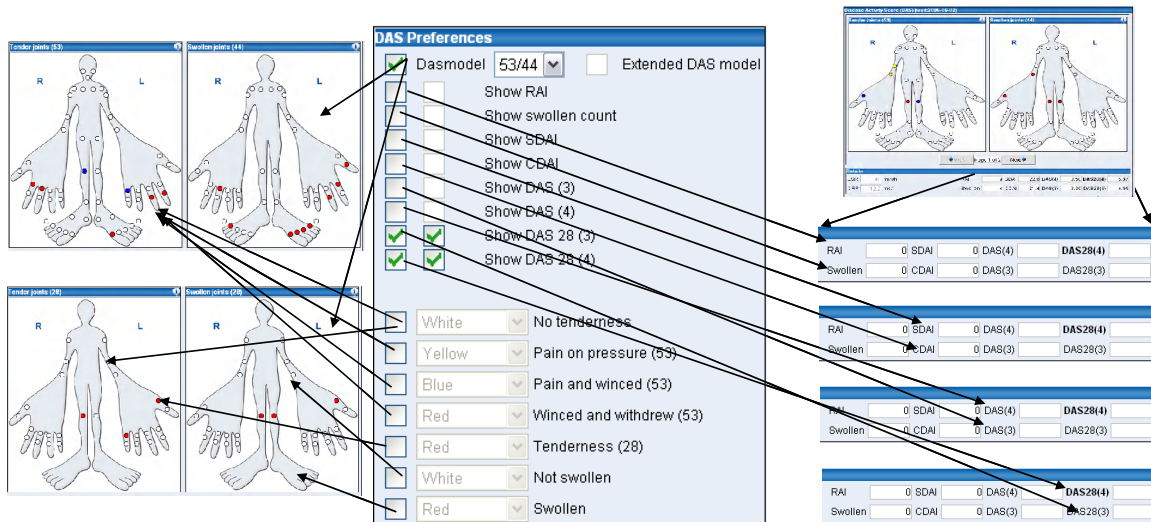


It is important for the user to remember the following points when changing any item(s) on his/her profile:

- Always select the left-hand box first; this indicates that you wish to change something about the current setting
- Having checked the left-hand box, enter the intended future setting using the right-hand box. A tick indicates that the user wishes to view a certain feature. Removing the tick will remove that feature/function from view.
- Example: if a user wishes to switch from the DAS 53/44 view to the DAS28, he may want to remove the RAI box from the DAS page. In that situation, he should tick the left-hand box for RAI, and the right-hand box should remain empty.

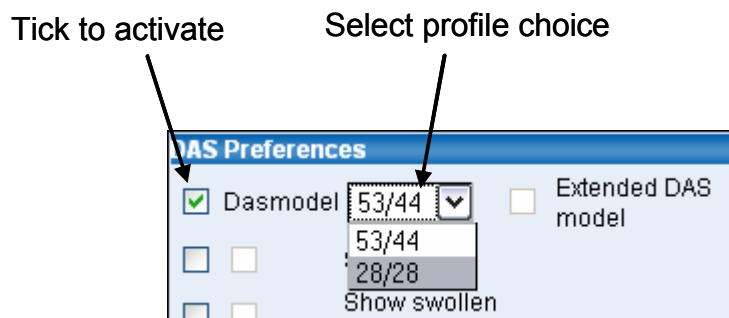
2.3.2 Changing profile settings

The links between the DAS preferences in the profile page and the application view are shown below



The profile altering function is activated by selecting the first checkbox. This action tells the application that the user wants to be responsible for determining the status of the particular profile item in question. **If a user does not click the first checkbox, the profile property maintains a default value set by the Administrator.**

When activated, the profile is then altered using the drop down menu or the checkboxes. Drop down menus list the choices for the profile, as shown below for the DAS mannequin, which can have two options - DAS53/44 or DAS28/28.



Where there is no drop down menu, the profile is altered to an "on" or "off" status using the second checkbox. Some examples are shown below.

By ticking these boxes, user has told the application That they want to be responsible for setting the value

User is in control of these values and Has set the value to "off". This means that SDAI and CDAI scores will not be visible in the DAS screen In the application

By leaving this box blank, user is not in control of this setting, which will remain at a default value

User is in control of this value and Has set the value to "on". This means that DAS(4) score will be visible in the DAS screen In the application

NOTE: It is highly recommended that the default values for the colours of tender and swollen joints remain unchanged.

The link between the graph profile and the graphics page is shown below:

If user wishes to display **ALL** disease activity scores, the coloured boundaries cannot be displayed since the boundaries are variable

If **ONLY** the DAS28(3) and DAS28(4) graphics are selected, the coloured status boundaries will be visible

NOTE: The DAS28(4) measurement is always visible in the application. This setting can never be switched off.

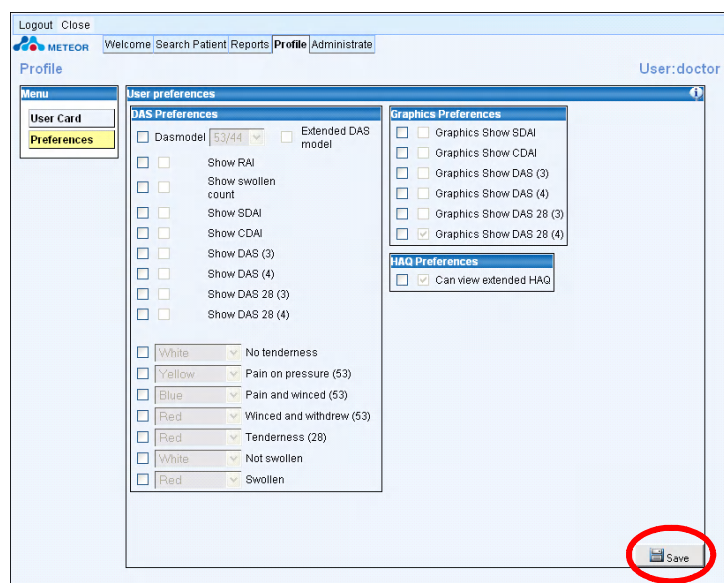
2.3.3 Saving Profile Changes

Once the user is satisfied with the profile settings, the new profile must be saved by clicking the save button, as shown in the next diagram.

The profile changes are not immediately applied and only become active once the user logs out and then back into the application.

In addition, the user cannot modify the DAS profile for any patient visit retrospectively - once a visit has been started and data entered, the profile applied will remain and cannot be changed. For this reason, it is suggested that the user decides upon their preferred disease assessment set up, modifies the profile accordingly and sticks to this profile, rather than changing the profile frequently.

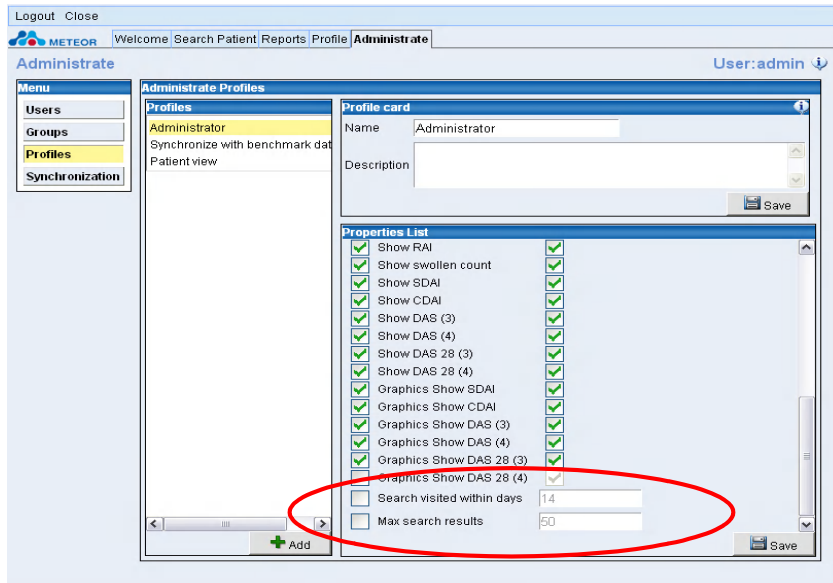
If the user wishes to check the profile settings at any point, they must go into the profile page, click preferences, then click preferences again to show the current status.



2.4 Adding a patient record to the system

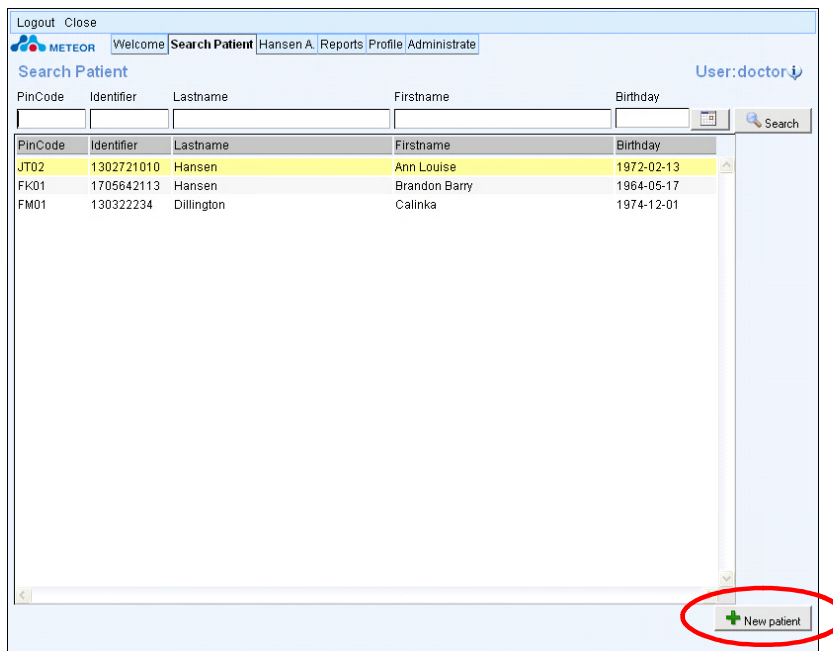
When users enter the system, they will be presented with a list of patients. In order to maximise efficiency, the system has a default setting so that all patients with visits in the past 14 days will be shown, up to a maximum of 50 patients. If a patient's name does not appear on the list, clicking on the 'Search' button will allow the user to view the entire patient list.

The setting which determines the time window and number of patients to be included in the list seen on login can be adjusted by users with administrator privileges. See screenshot below:



On using the application for the first time, there will be no patients and the record must be created.

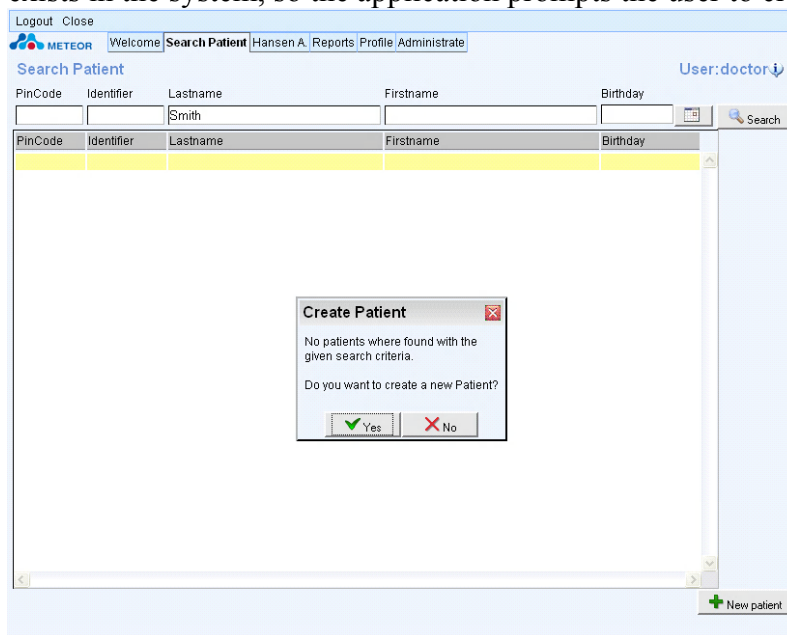
The user will be presented with the following screen on entry to the application (in this view three patients exist, for illustrative purposes):



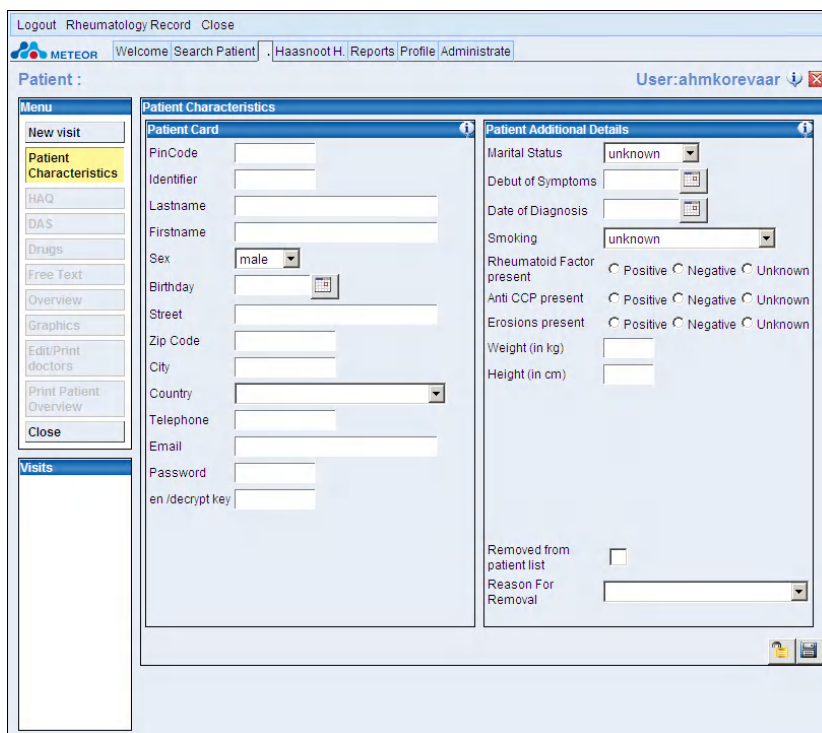
Clicking the new patient button will take the user to the patient registration page. Depending on the user's screen settings, it may be necessary to scroll down to locate the 'New patient' button at the bottom of the page.

Alternatively, the user can directly enter some patient details in the search patient fields - if the patient is not found, the application will automatically ask whether a

new record is to be created. This is shown below - no patient with Lastname: **Smith** exists in the system, so the application prompts the user to create a record.



The patient registration page is shown below:




The registration card should be completed in full by the user. There are conditions applied to the completion of this card which are indicated below:



1. The PIN code - a mandatory field - is a unique code assigned to a patient by each site. Each patient must be allocated a PIN code, but the policy for setting

what the PIN code consists of is a local decision. For example, one hospital/clinic may set the pin code as the patient's initials and date of birth (MB011059), while another may set sequential PIN codes (e.g. Leiden001, 002, etc). The site administrator should ensure that the policy by which the PIN code is determined is readily available to staff who may be entering patient records.

2. The Identifier code – this is also a mandatory field
3. The Pincode and Identifier fields must be different for each patient record. Duplicates will not be accepted by the system. These fields are useful if the user wishes to enter any pre-existing unique anonymous identifier which may exist as part of a patient dossier or patient study.
4. The email address will not be accepted unless there is an @ sign
5. The date of birth will not be accepted if the date of symptoms or date of diagnosis have been entered and the date of birth falls **after** these dates

The user should complete all details and save this page using the save button, at the bottom of the page. 

2.4.1 Modifying the registration details

Users can modify the registration details at a later stage, if desired. However, the date of birth, pincode and identifier can only be modified by first clicking the **unlock** button , modifying and then re-saving .

2.4.2 Completing the patient additional demographic details

The demographic data is completed by selecting from the pull down lists, clicking the checkboxes and entering dates and measurements. There are some conditions applied to these details

1. The lists are fixed and cannot be amended or updated with additional categories.
2. The date of diagnosis cannot be before the date of birth or the date of symptoms
3. The date of symptoms cannot be before the date of birth

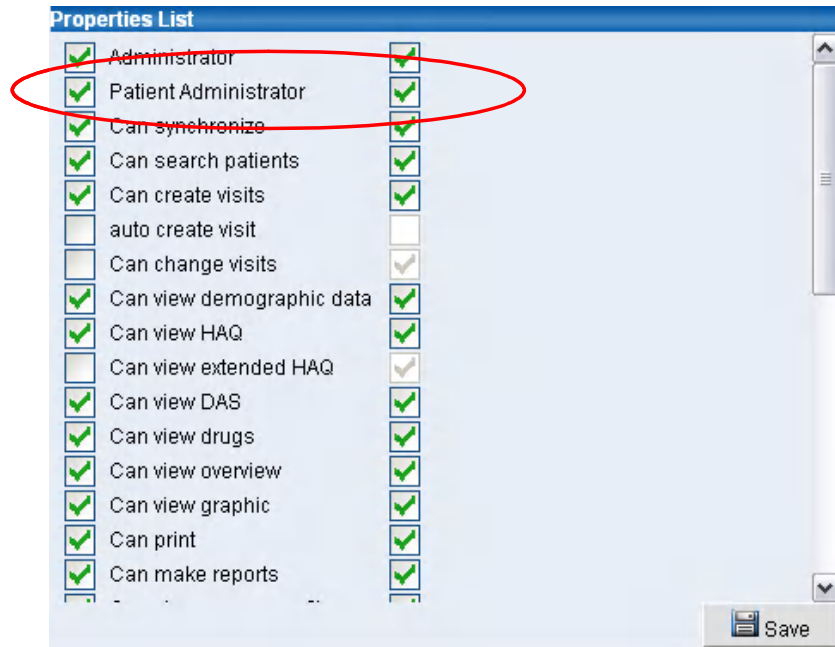
2.5 Allocating log-in privileges to patients

It is possible to allocate limited user access to patients, if local hospital/clinic policy permits this. The application allows patients to access their record, for the purposes of completing the HAQ questionnaire only. Patients will be able to access the system using their unique PIN code, a 6-digit password and a patient-specific encryption key.

In order to allocate access rights to patients, the appropriate properties need to be set up, both for users and for patients.

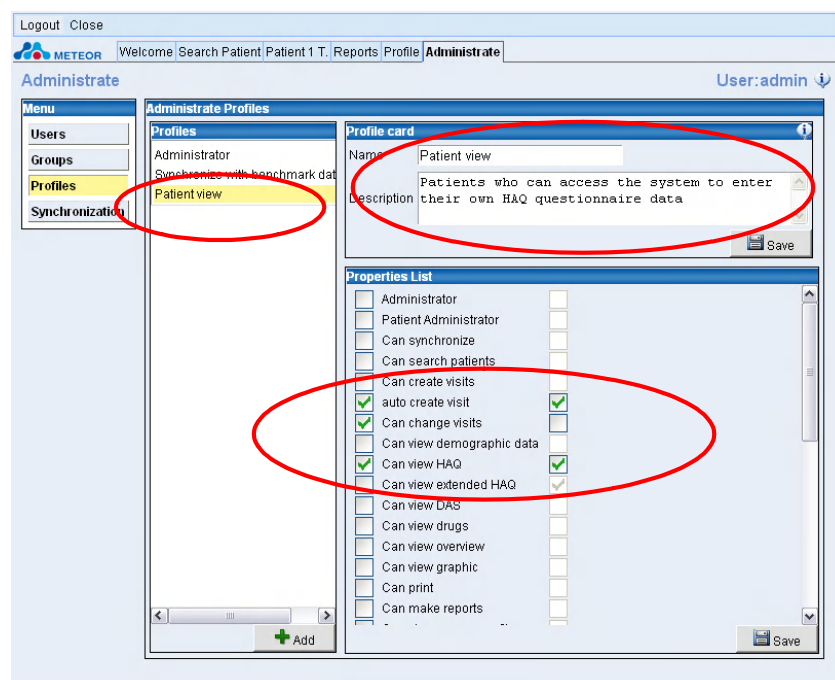
2.5.1 Set the correct administrative profile

The administrator should ensure that all users who may create patients and allow those patients to access the system, should have 'patient administrator' enabled on their profile:



The administrator should also ensure that 'Auto-create visit' is ONLY checked for the patient group, not medical staff.

The appropriate profile for users in the 'Patient' group is shown below:



2.5.2 Allocate rights at patient registration

When a user of the Application has 'Patient Administrator' assigned in his/her profile, the user will see two additional fields in the Patient Characteristics page. These are:

- Password
- en/de-cryption key

The password must be a minimum of six (6) characters in order to be valid.

Patient access will only be available to patients for whom these fields are completed.

Patients who are authorised to do so will access the system by using a combination of 3 pieces of information:

1. their unique PIN Code
2. a patient-specific password, which may be defined by the patient, but must be entered into the patient characteristics page. **Do not enter the user password here.**
3. a patient-specific encryption key, which may be defined by the patient and is also entered into the patient characteristics page. **Do not enter the site encryption key here.**

The screenshot shows the METEOR application interface. The top navigation bar includes 'Logout', 'Rheumatology Record', 'Close', and 'METEOR'. Below this, there are tabs for 'Welcome', 'Search Patient', 'Patient 1 T.', 'Reports', 'Profile', and 'Administrate'. The main content area is titled 'Patient : T001234 Test Patient 1' and 'User: admin'. The 'Patient Characteristics' section contains the following fields:

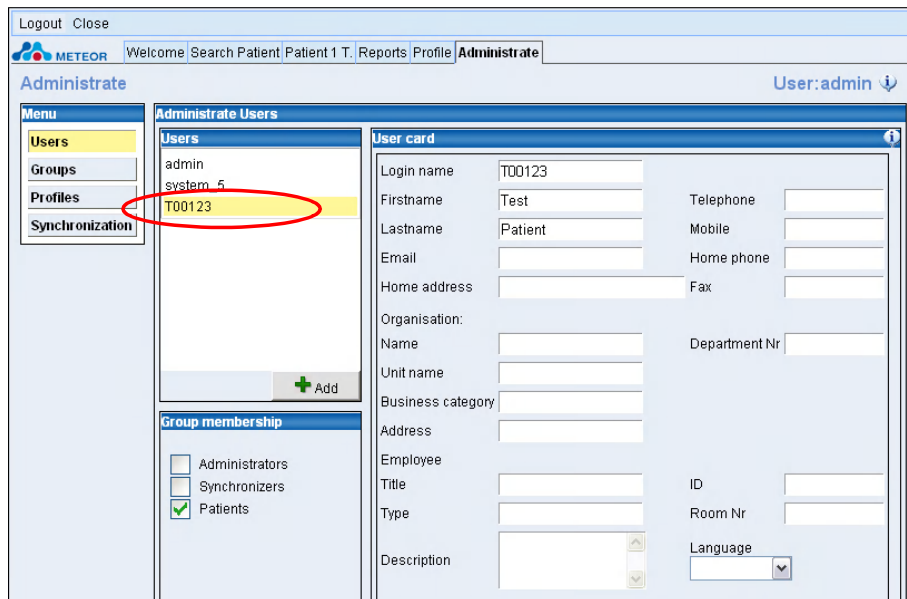
PinCode	T001234
Identifier	T001234
Lastname	Patient 1
Firstname	Test
Sex	female
Birthdate	1959-02-27
Street	
Zip Code	
City	
Country	
Telephone	
Email	
Password	patient
en/de-cryption key	meteor

The 'Patient Additional Details' section contains the following fields:

Marital Status	divorced
Debut of Symptoms	1998-12-30
Date of Diagnosis	2002-03-01
Smoking	unknown
Rheumatoid Factor present	<input type="checkbox"/>
Anti-CCP present	<input checked="" type="checkbox"/>
Erosions present	<input checked="" type="checkbox"/>
Weight (in kg)	67
Height (in cm)	170

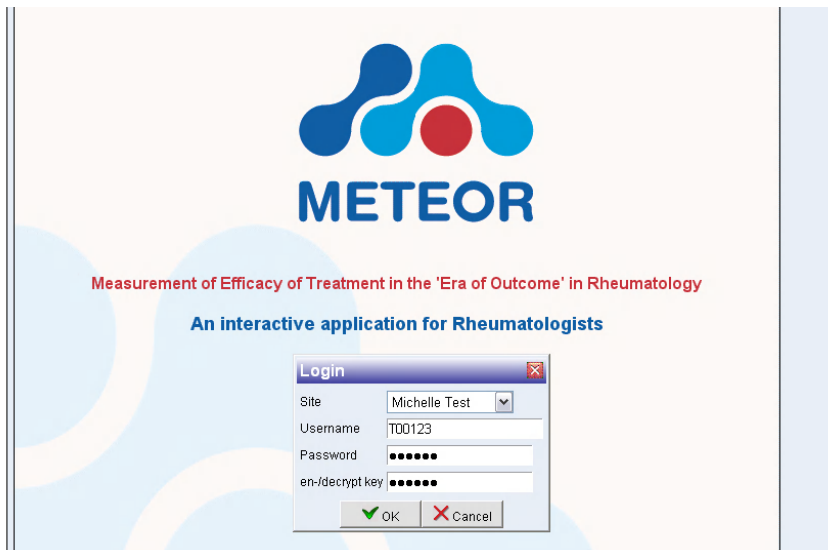
The PIN Code, password and encryption key may be amended at any time, by any user authorised to amend patient characteristics, by clicking on the 'Unlock' button, entering and saving the new details.

Once the password and en/decryption key fields have been completed, the patient will automatically be added to the users for that site. This can be confirmed by checking the profile page:



2.5.3 Patient Log-in

Patients may be able to log into the application either on-line or by accessing a terminal in the hospital/clinic waiting room. Patient users will be presented with the same login screen as all other users:



The patient should enter his/her user name, password and en/decryption key, and is immediately taken to the HAQ screen. Note that all other menu options are unavailable to patient users, except Print patient overview. Similarly, the combination of the unique PIN code, password and en/decryption key ensure that the patient is able to view his/her HAQ record and print patient overview only:

Logout Rheumatology Record Close

METEOR Patient 1 T. Welcome

Patient : T001234 Test Patient 1 User: T00123

Menu

- New visit
- Patient Characteristics
- HAQ**
- DAS
- Drugs
- Overview
- Graphics
- Print Patient Overview
- Close

Visits

- 2007-10-23

Health Assessment Questionnaire (HAQ) [visit: Today]

Please check the response that best describes your usual abilities - over the past week:

Dressing and Grooming
 Are you able to: Dress yourself, including tying shoelaces and doing buttons?

Shampoo your hair?

Arising
 Are you able to: Stand up from a straight chair?

Get in and out of bed?

Eating
 Are you able to: Cut your meat?

Lift a full cup or glass to your mouth?

Open a new milk carton?

Walking
 Are you able to: Walk outdoors on flat ground?

Climb up five steps?

Page 1 of 5

HAQ score: 1.00 Total pain score: 67 Patient global assessment: 62

Lock Save

2.6 Viewing a newly registered patient

The patient search page has been designed to list patients by date of most recent visit. Therefore if a patient is created, but has no recorded visit, the record will not automatically appear on the patient list, as shown below. However as shown on the second diagram, the newly created record remains accessible via a tab showing the patient's name at the top.

Logout Rheumatology Record Close

METEOR Welcome Search Patient Blackwell J. Reports Profile Administrate

Patient : J07 James Blackwell User: mcuddigan

Menu

- New visit
- Patient Characteristics**
- HAQ
- DAS
- Drugs
- Overview
- Graphics
- Print Patient Overview
- Close

Visits

Patient Characteristics

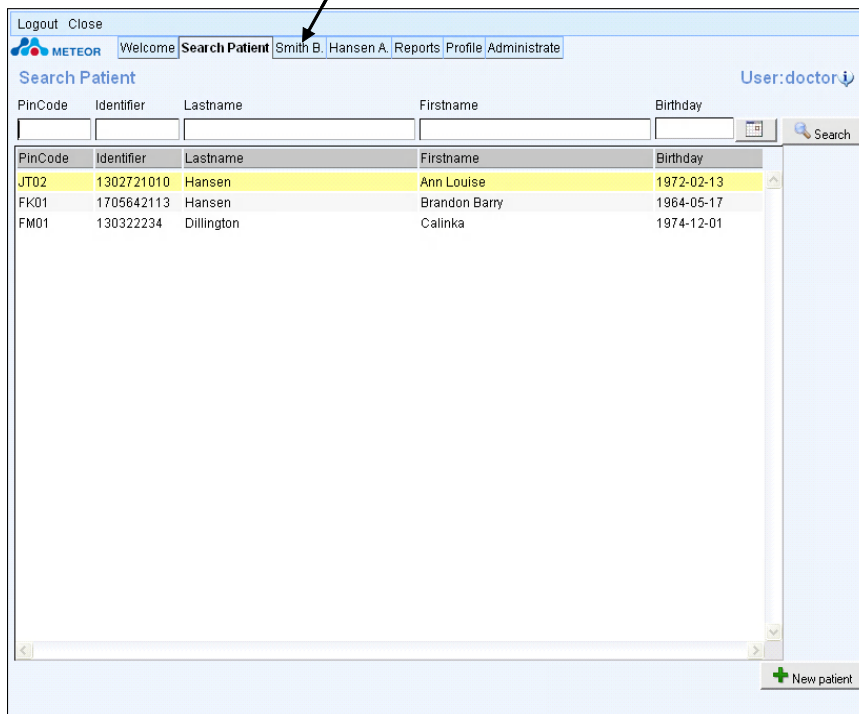
Patient Card

PinCode JB007
 Identifier J07
 Lastname Blackwell
 Firstname James
 Sex male
 Birthday 1959-05-02
 Street
 Zip Code
 City
 Country
 Telephone
 Email
 Password blackwell
 en-/decrypt key james07

Patient Additional Details

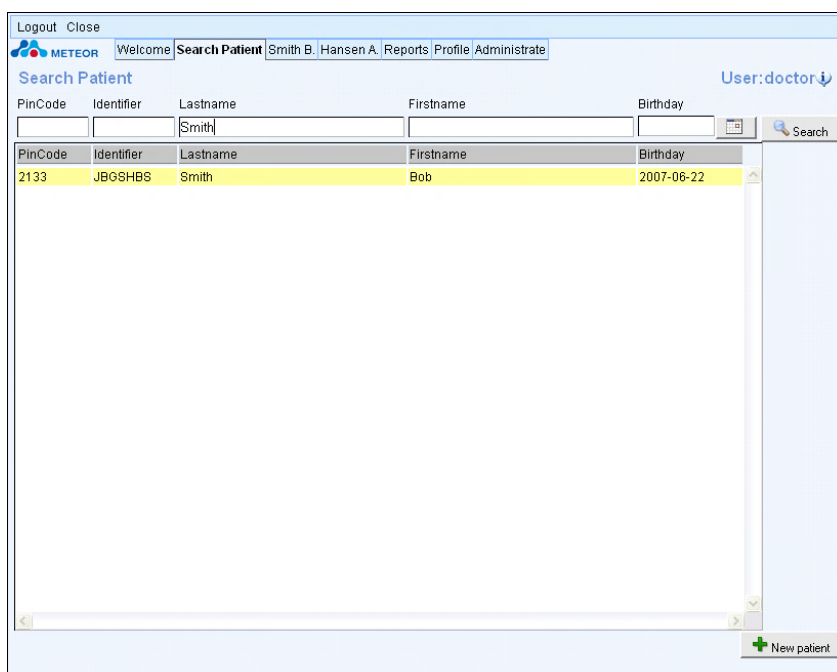
Marital Status unknown
 Debut of Symptoms 2003-05-05
 Date of Diagnosis 2004-02-01
 Smoking unknown
 Rheumatoid Factor present
 Anti-CCP present
 Erosions present
 Weight (in kg) 83
 Height (in cm) 197

Open records remain accessible via a tab until closed by the user



The new patient is not immediately visible since the application lists patients by date of last visit, and in order of the most recent visit. Patients with no visits entered therefore do not appear on the list, which is automatically filtered.

However, the newly created patient can be accessed, even if no visit has been recorded, by typing in a search criteria such as Lastname, as shown below:



This can then be opened by clicking on the entry.

Once a new visit is created for the patient, they will automatically be added to the list as shown in subsequent sections of the guide.

2.7 Creating a new visit

A new visit is created by clicking the new visit button in the main application menu, as shown in the diagram below:

The screenshot shows the METEOR application interface for patient JBGSHBS Bob Smith. The 'Menu' on the left has the 'New visit' button circled in red. The main area is divided into 'Patient Card' and 'Patient Additional Details'. The 'Patient Card' contains fields for PinCode (2133), Identifier (JBGSHBS), Lastname (Smith), Firstname (Bob), Sex (male), Birthday (2007-06-22), and various address fields. The 'Patient Additional Details' section includes Marital Status (unknown), Debut of Symptoms, Date of Diagnosis, Smoking (unknown), and checkboxes for Rheumatoid Factor present, Anti-CCP present, and Erosions present. There are also input fields for Weight (in kg) and Height (in cm). At the bottom right, there are 'Unlock' and 'Save' buttons.

Once clicked, the user will be asked to record a date for the visit. This allows users to record visits in the past, should the user wish to enter previously recorded information for this patient.

This screenshot shows the same patient record interface as above, but with a dialog box open over the 'Patient Card' section. The dialog box is titled 'Set a date for a new visit' and contains a date input field with the value '2007-06-22'. Below the input field are 'OK' and 'Cancel' buttons. The background interface is dimmed, showing the 'New visit' button in the menu and the patient details form.

If a visit is recorded in the past, the record cannot be updated with information unless the user unlocks the record, as shown below. This feature is in place to prevent the user from inadvertently changing pre-recorded information.

Logout Rheumatology Record Close

METEOR Welcome Search Patient Douglas J. Reports Profile Administrate

Patient : Jd01 James Douglas User:mcuddigan

Menu

- New visit
- Patient Characteristics
- HAQ
- DAS**
- Drugs
- Overview
- Graphics
- Print Patient Overview
- Close

Visits

- 2007-11-23
- 2007-11-14
- 2007-08-22
- 2007-07-07
- 2006-06-02**

Disease Activity Score (DAS) [visit:2006-06-02]

Tender joints (53) Swollen joints (44)

Details

ESR	45 mm/h	RAI	9	SDAI	22.6	DAS(4)	3.58	DAS28(4)	5.37
CRP	12.2 mg/l	Swollen	4	CDAI	21.4	DAS(3)	3.36	DAS28(3)	4.99

Unlock Save

After the record has been unlocked, the user can record the details of the visit as normal.

Clicking new visit will always present the user with a default visit date which will be the date the new visit button was clicked. In addition, creation of a new visit will immediately take the user to the DAS data entry page.

Logout Rheumatology Record Close

METEOR Welcome Search Patient Douglas J. Reports Profile Administrate

Patient : Jd01 James Douglas User:mcuddigan

Menu

- New visit
- Patient Characteristics
- HAQ
- DAS**
- Drugs
- Overview
- Graphics
- Print Patient Overview
- Close

Visits

- 2007-11-23**
- 2007-11-14
- 2007-08-22
- 2007-07-07
- 2006-06-02

Disease Activity Score (DAS) [visit:2006-06-02]

Tender joints (53) Swollen joints (44)

Details

ESR	45 mm/h	RAI	9	SDAI	22.6	DAS(4)	3.58	DAS28(4)	5.37
CRP	12.2 mg/l	Swollen	4	CDAI	21.4	DAS(3)	3.36	DAS28(3)	4.99

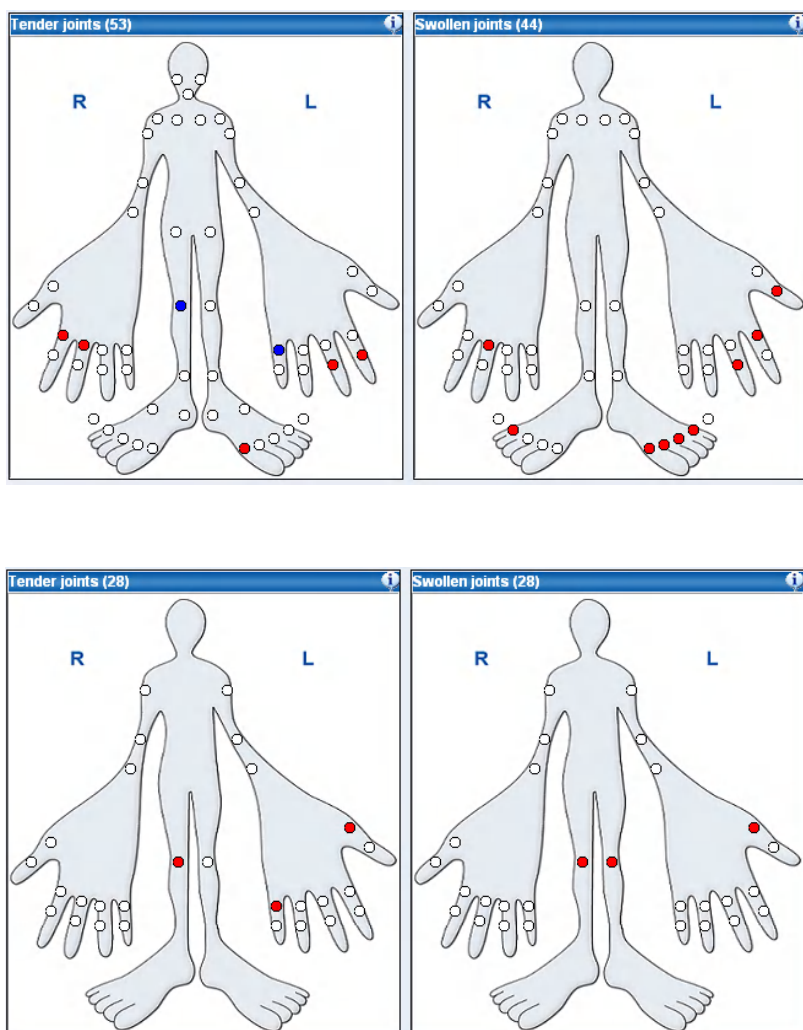
Unlock Save

The date of the visit will automatically appear in the visits list.

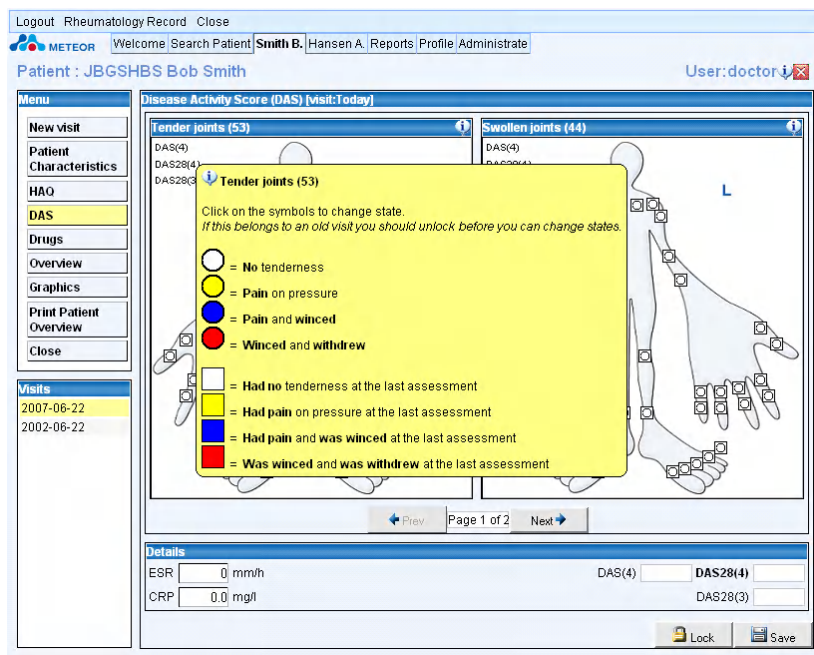
2.8 Recording disease assessment data

2.8.1 Using the DAS mannequin

There are two different DAS mannequins available for swollen and tender joint assessment. The mannequin displayed will be dependent on the profile selected by the user, or the default profile applied by the system administrator. As a rule, the DAS53/44 mannequin is always the default since this provides a means of capturing DAS28(3), DAS28(4), DAS(3), DAS(4), SDAI and CDAI information.



The information bubbles in the top right hand corner of each mannequin frame provide information on the assessment result based on joint colour, as shown in the diagram below - this is the result of clicking the information bubble for the tender joint 53/44 mannequin.



1. Selecting and scoring the joints is achieved by hovering over the joint using the arrow.
2. The joint will enlarge slightly, making it easier to capture the score.
3. The score is captured by clicking on the joint.
4. Where more than one score is possible (such as in capturing information for the Ritchie Articular index - RAI), multiple clicks allows the user to cycle through the available options
5. The circles represent the current score for the joint
6. The squares represent the previous score for the joint

When the first visit is recorded for a patient the joints will appear as circles only, since no previous data is available.

2.8.2 Global assessments and pain assessments

Once the user has recorded the joint scoring, clicking on the 'next' button on the DAS page will take the user to the Visual Analogue Scales for recording the global assessments and pain assessment, as indicated in the diagram below

Disease Activity Score (DAS) [visit:2006-06-02]

Tender joints (53)

Swollen joints (44)

← Prev Page 1 of 2 Next →

Details					
ESR	45 mm/h	RAI	9	SDAI	22.6
		DAS(4)	3.58	DAS28(4)	5.37
CRP	12.2 mg/l	Swollen	4	CDAI	21.4
		DAS(3)	3.36	DAS28(3)	4.99

Logout Rheumatology Record Close

METEOR Welcome Search Patient **Smith B.** Hansen A. Reports Profile Adminstrate

Patient : JBGSHBS Bob Smith User:doctor

Menu

- New visit
- Patient Characteristics
- HAQ
- DAS**
- Drugs
- Overview
- Graphics
- Print Patient Overview
- Close

Visits

- 2007-06-22
- 2002-06-22

Disease Activity Score (DAS) [visit:Today]

PAIN

please enter the value, that best fits your (the patients) experience of pain due to the disease on average last week.

No Pain 0 1 2 3 4 5 6 7 8 9 10 Pain as bad as possible

Patient's global assessment of disease activity

please enter the value, that best fits your (the patients) experience of the current activity of the disease.

Not active at all 0 1 2 3 4 5 6 7 8 9 10 Extremely active

Doctor's global assessment

Asymptomatic 0 1 2 3 4 5 6 7 8 9 10 Very severe

← Prev Page 2 of 2 Next →

Details			
ESR	0 mm/h	DAS(4)	DAS28(4)
CRP	0.0 mg/l		DAS28(3)

Lock Save

The default position of the pointer on the scale is at 5, however the scale does not record any score until it is activated. The user activates the scale in one of two ways:

1. User clicks on the desired score directly on the scale - the arrow will automatically reposition and the score is recorded
2. User selects the pointer and moves it by sliding to the appropriate position

The user should then save the information by clicking the save button.

The visual rating scales for Pain and Patient Global Assessment are the same in the DAS assessment and the HAQ assessment. They should therefore only be completed once for each patient visit. The sequence will depend on the individual clinic's workflow, but if the DAS is completed before the HAQ, then the patient should not complete the scales again when completing the HAQ assessment. Similarly, if the HAQ is completed before the DAS score, the ratings from the visual rating scales will be transferred automatically to the DAS assessment and used to calculate the DAS score.

2.8.3 Entering ESR and CRP results

The ESR and CRP results are manually entered by the user by clicking on the relevant field and entering the score using the keyboard. By default, the ESR and CRP values should be blank, since a score of 0 is a reading which will contribute to the disease assessment calculations.

The ESR score is limited to a maximum of 200.

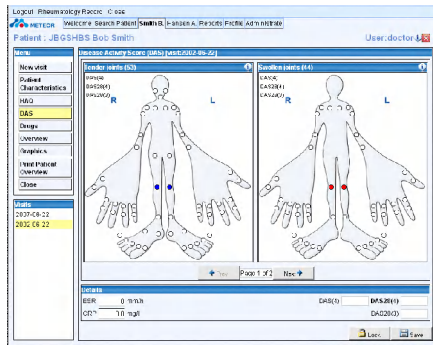
2.8.4 Calculating disease activity scores

The disease activity scores are automatically calculated based on data entered in the DAS assessment (including visual analogue scales), the ESR and CRP results. Thus, once all parameters for any calculation have been completed, the score is automatically calculated irrespective of the field being visible to the user.

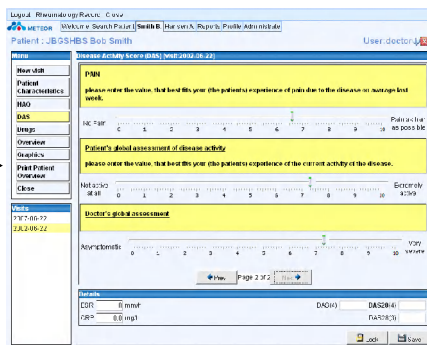
If a user has selected only to show DAS(3) and DAS(4) on the screen (see profile set up in section 3.2) and records all data for these calculations, the SDAI, CDAI, DAS28(3) and DAS28(4) results are all also calculated and recorded in the system on saving.

The DAS28(4) score is always visible in the application and cannot be removed from the view.

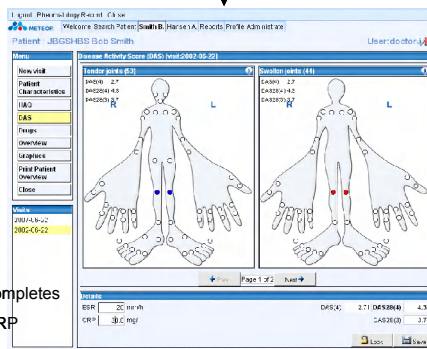
Once all data necessary to calculate a disease activity score is available, the field will automatically be populated with the result, if the field is displayed in the users view.



User scores joints (no DAS score)



User completes VAS (no DAS score)



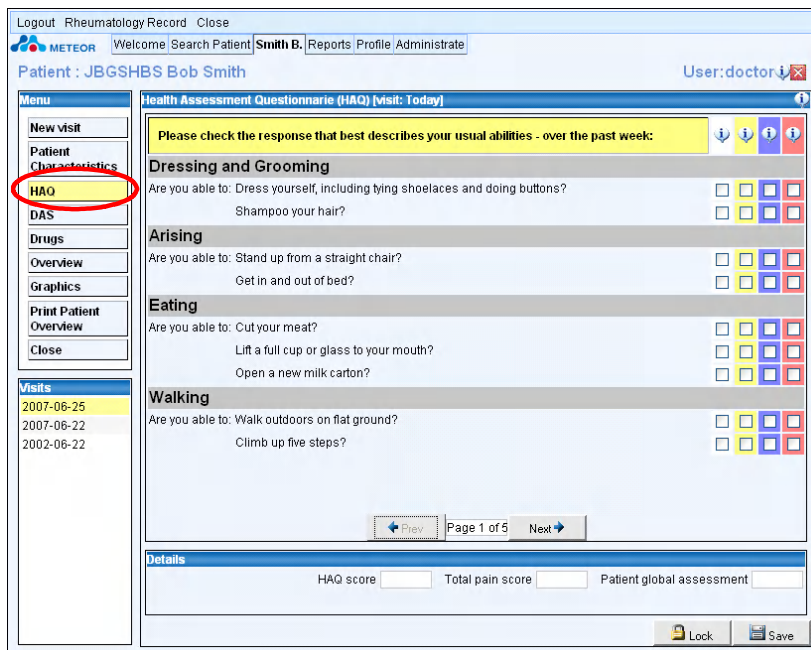
User completes ESR/CRP

DAS Results Now appear

2.9 Recording Health Assessment Information

The Health Assessment Questionnaire (HAQ) in the Meteor Application is a version of the HAQ Disability Index (HAQ-DI).

The HAQ is accessed by clicking on the HAQ menu button, as shown below:



The information bubbles show how the coloured columns relate to the HAQ, as shown below:

Health Assessment Questionnaire (HAQ) [visit: Today]

Please check the response that best describes your usual abilities - over the past week:

Health Assessment Questionnaire (HAQ)

Are you able to: Dress yourself, including tying shoelaces and doing buttons?

Are you able to: Shampoo your hair?

Are you able to: Stand up from a straight chair?

Are you able to: Get in and out of bed?

Are you able to: Cut your meat?

Are you able to: Lift a full cup or glass to your mouth?

Are you able to: Open a new milk carton?

Are you able to: Walk outdoors on flat ground?

Are you able to: Climb up five steps?

HAQ score: Total pain score: Patient global assessment:

The HAQ is completed by placing ticks in the available checkboxes to indicate the patients ease of performing routine tasks.

Health Assessment Questionnaire (HAQ) [visit: Today]

Please check the response that best describes your usual abilities - over the past week:

Dressing and Grooming

Are you able to: Dress yourself, including tying shoelaces and doing buttons?

Are you able to: Shampoo your hair?

Arising

Are you able to: Stand up from a straight chair?

Are you able to: Get in and out of bed?

Eating

Are you able to: Cut your meat?

Are you able to: Lift a full cup or glass to your mouth?

Are you able to: Open a new milk carton?

Walking

Are you able to: Walk outdoors on flat ground?

Are you able to: Climb up five steps?

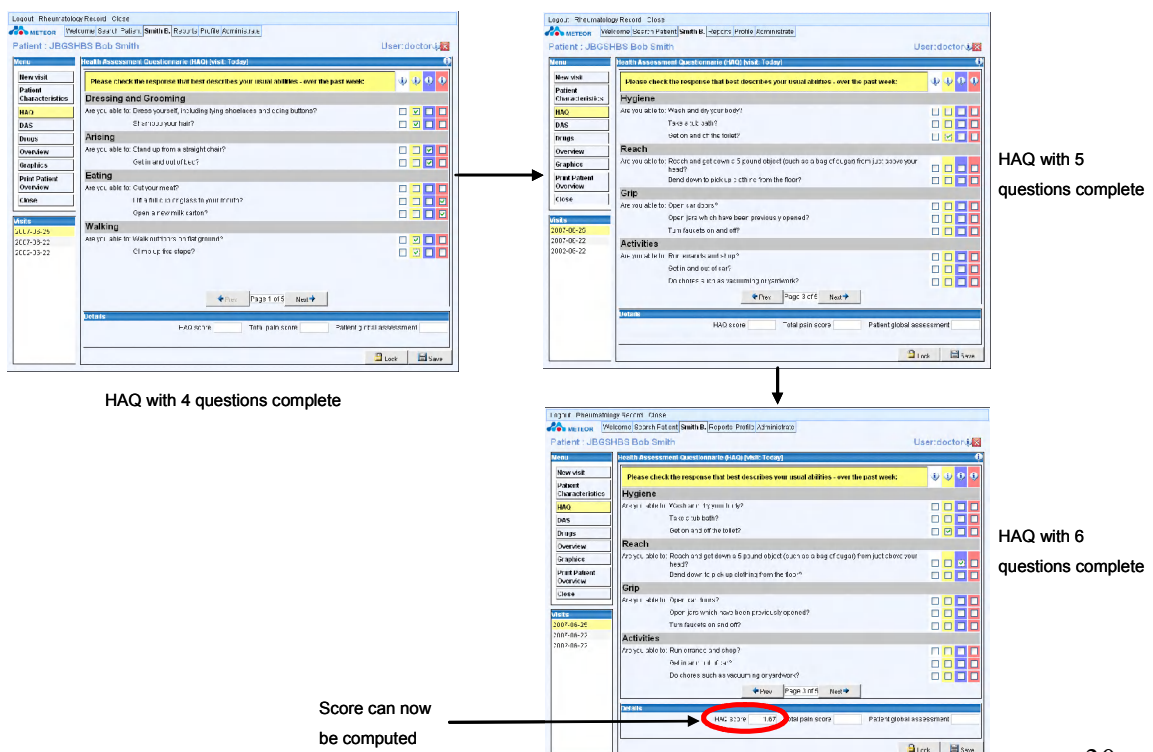
HAQ score: Total pain score: Patient global assessment:

The aids and devices items are automatically linked to the corresponding HAQ question - where other aids and devices are used, a drop down list is used to link the answer to the relevant section.

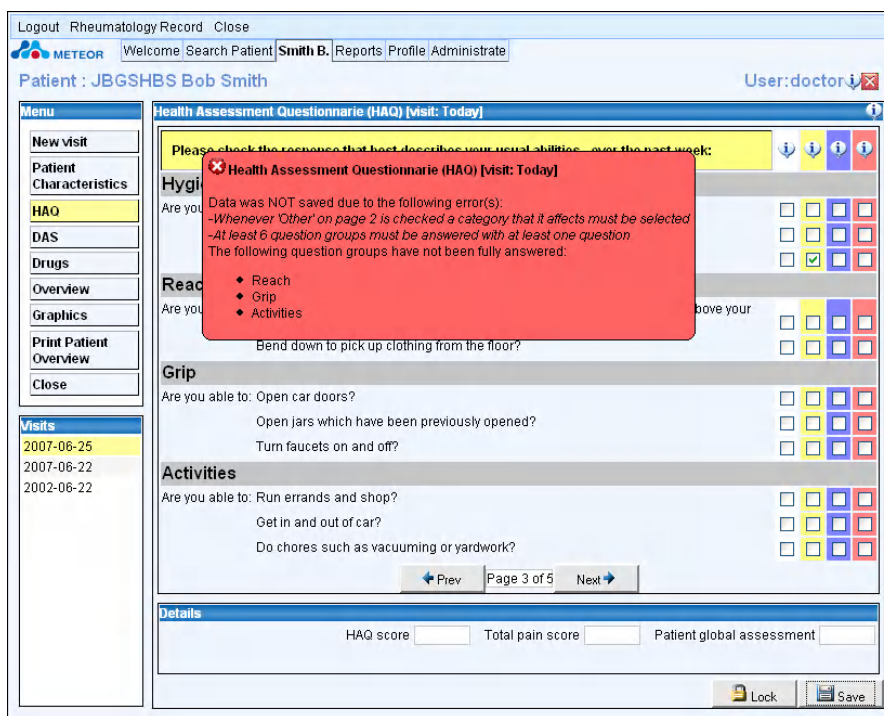
The user must save the data in the HAQ page using the save button before exiting.

2.9.1 Calculating the HAQ score

The HAQ score is automatically calculated when the minimum information required to compute a HAQ has been entered (6 of the 8 categories complete).

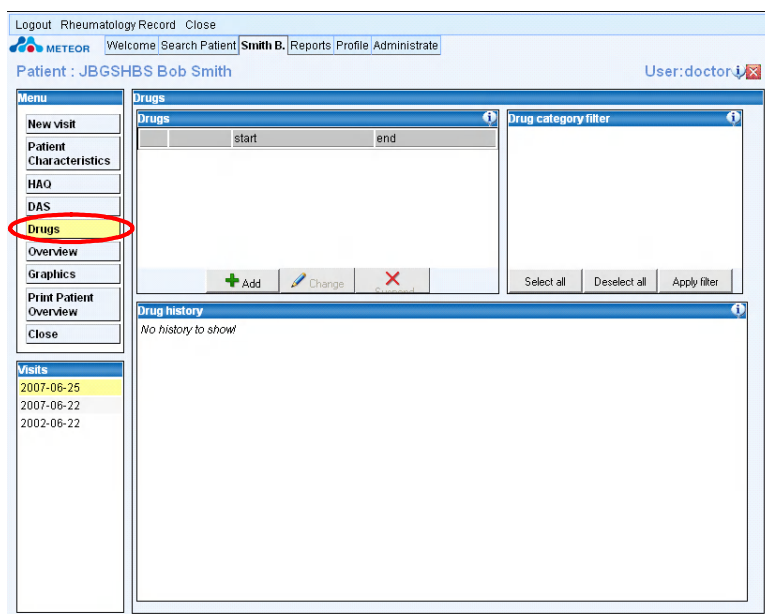


If a user attempts to save the HAQ without completing the minimum number of questions, an error message will appear informing the user of the completion criteria.



2.10 Recording Prescription Information

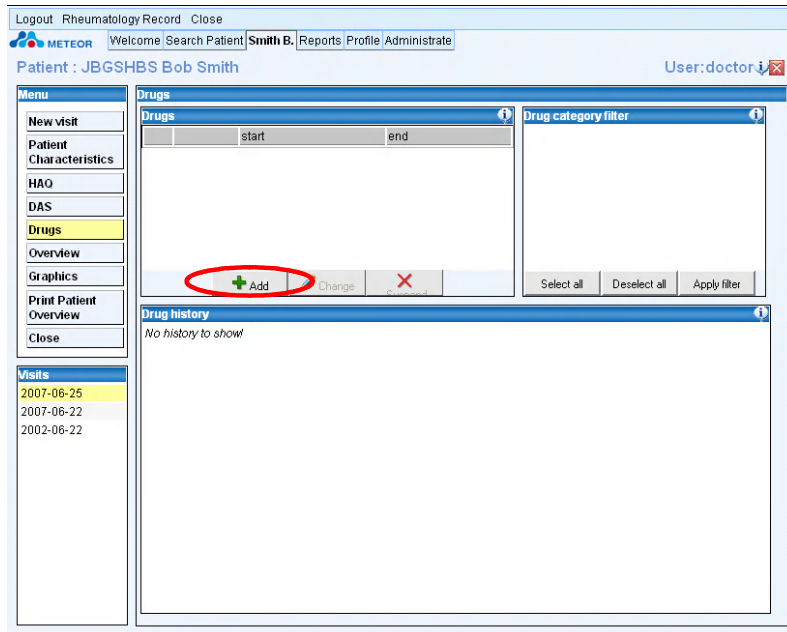
The Meteor application captures information on drug treatment for rheumatoid arthritis only. Users enter prescription information using the drugs page, which is accessed from the main menu as shown below:



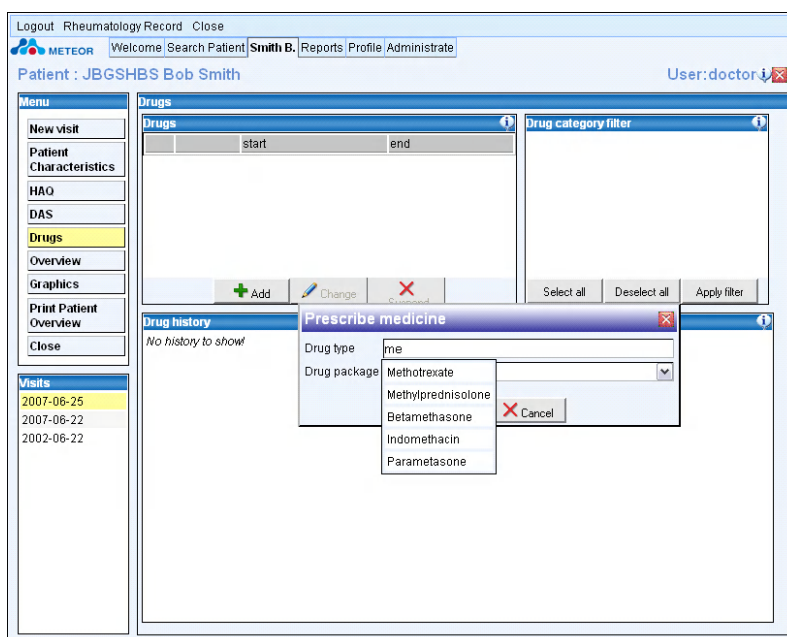
The drugs which can be prescribed are taken from a pre-approved list of common drugs used in the treatment of Rheumatoid Arthritis.

2.10.1 Adding a drug

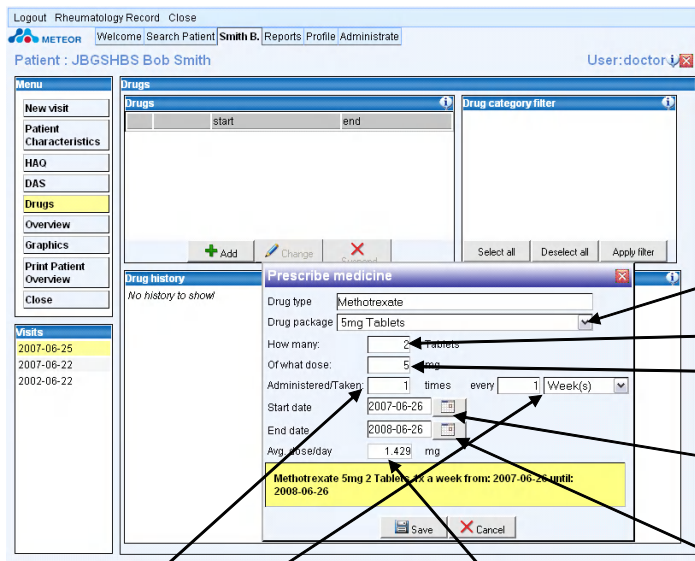
To add a drug, click the add button, as shown below:



A pop up will allow the user to type in the first few letters of the desired drug. The application has a search ahead prediction functionality and will pull up the closest matches in order for selection - this is shown below for methotrexate (user types "me")

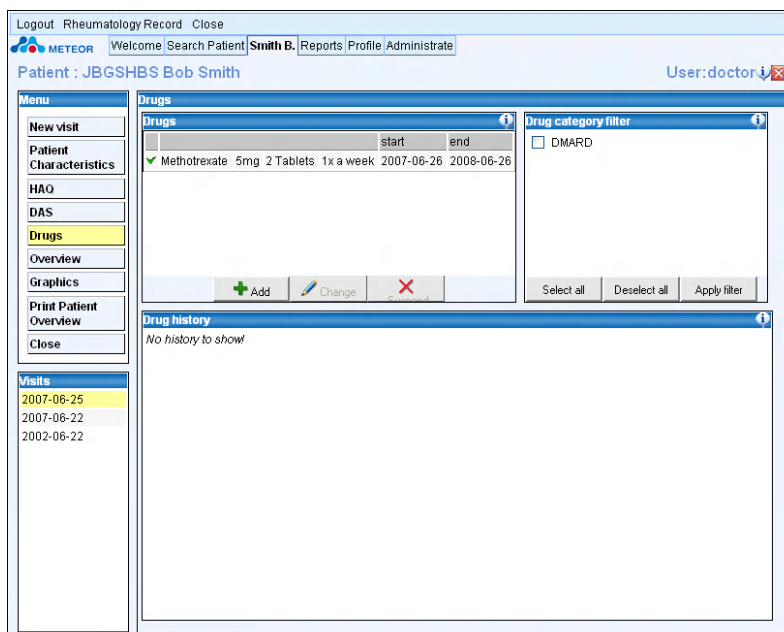


On selection of a drug, the prescription input module will appear for that drug, as shown:



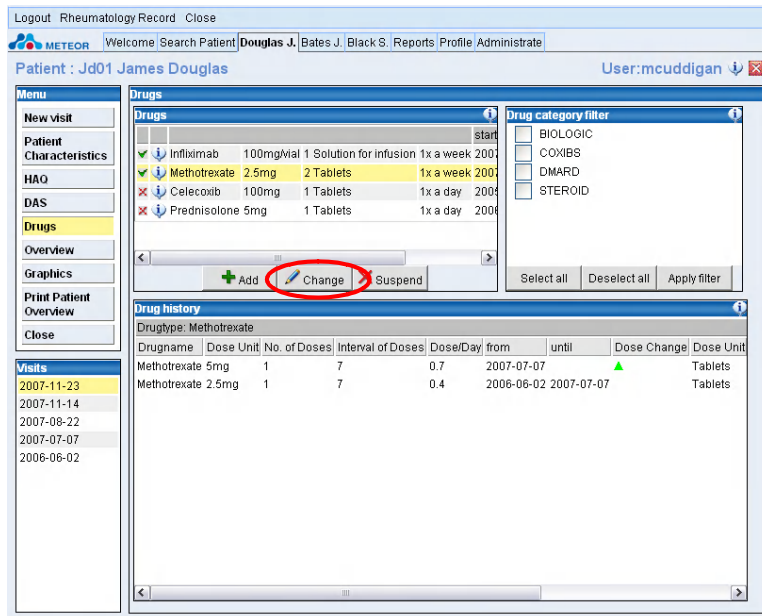
- Default packages available for selection via drop down menu
- User enters the number of tablets given
- Default dose is automatically entered, but user can manually overtype this entry
- Prescription start date – this can be in the past but it will automatically generate a warning. This defaults to the date the user is entering the prescription info
- Prescription end date – if left blank, this will be assumed to run forever until it is modified or suspended.
- These fields allow the user to reflect the frequency of dose
- The average dose per day is automatically calculated. A warning will appear if this falls below or above the maximum and minimum doses for any drug

Saving the prescription adds the drug to the main drugs window, as shown below. Each drug belongs to one or more categories (e.g. DMARD, NSAID). When a given drug is prescribed, the relevant category will automatically appear in the category window.

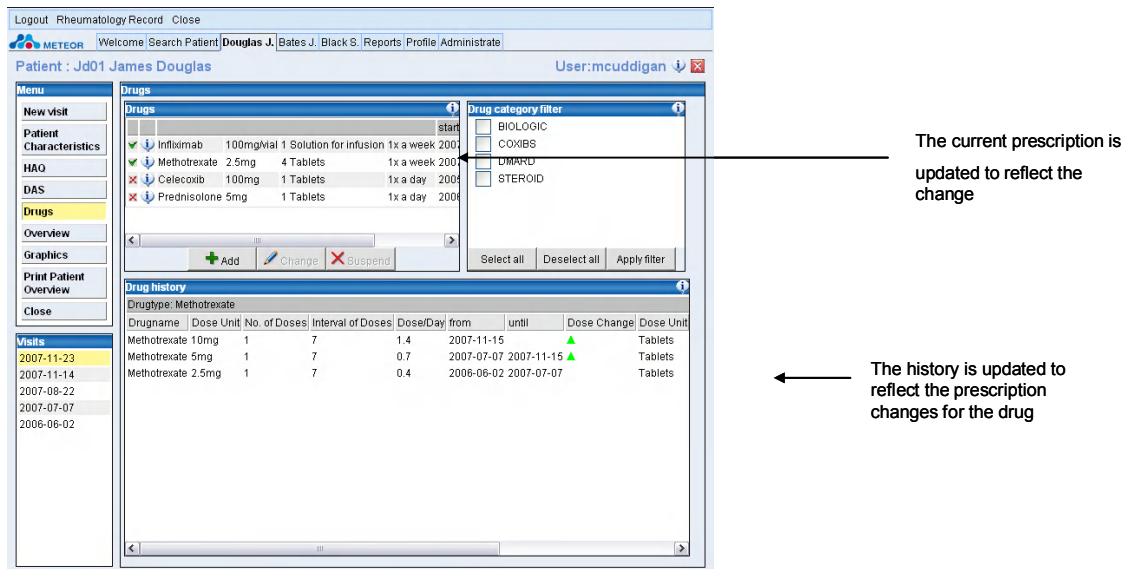


2.10.2 Modifying an existing prescription

An existing prescription can be modified by selecting the prescription entry in question and clicking the change button, as shown below:



The prescription is modified by updating the entry to reflect the new conditions, as shown below:



Once modified the change in prescription for the drug is reflected in the history box.

The screenshot shows a 'Change prescribed medicine' dialog box for Methotrexate. The dialog contains the following fields and options:

- Drug type: Methotrexate
- Drug package: 2.5mg Tablets
- How many: 4 Tablets
- Of what dose: 2.5 mg
- Administered/Taken: 1 times every 1 Week(s)
- Start date: 2007-11-15
- End date: (empty)
- Avg. dose/day: 1.429 mg
- Reason: Lack of efficacy (selected from a dropdown menu)

Annotations with arrows point to the Start date, End date, and Reason dropdown menu. The text next to the arrows reads: 'To alter prescription, enter the revised start Date, end date and any new conditions' and 'If required a reason can be entered from the drop down list'.

2.10.3 Suspending an active drug

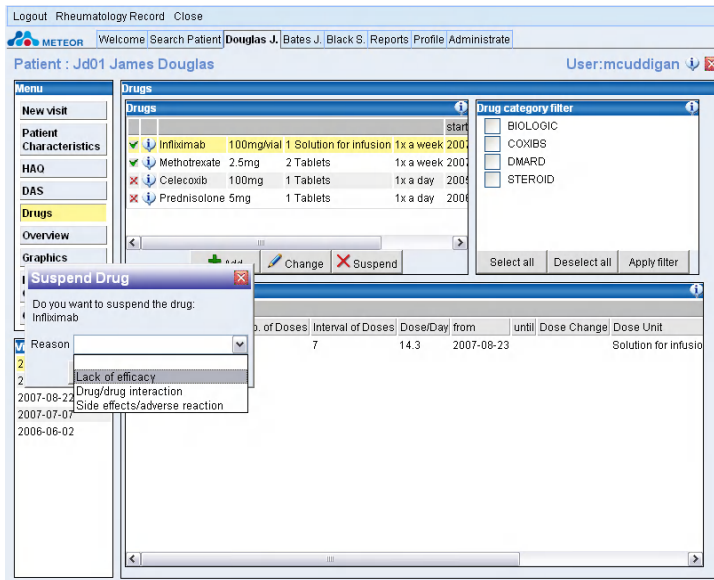
In some cases, it may be necessary to suspend a drug currently being taken. This may be for safety or other reasons. It is possible to record this in the application. The 'suspend' button should only be used for drugs currently being taken, that are to be stopped on the date of the visit.

If a drug is to be suspended, the user should click on the appropriate drug on the drugs page. This will activate the 'change' and 'suspend' buttons. Clicking on the 'suspend' button will cause a dialog box to pop up, in which the user will be asked to select a reason for suspending the drug. Possible reasons are:

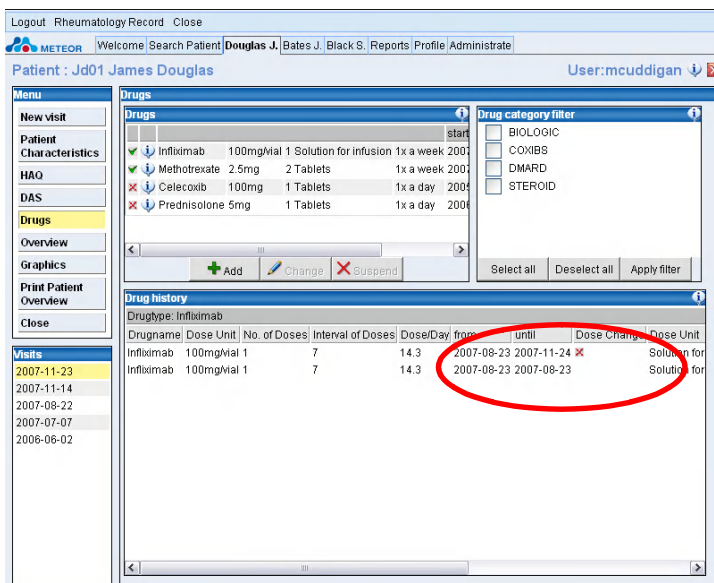
- lack of efficacy
- drug-drug interaction
- side effects/adverse reaction
- Remission
- Wish patient
- Pregnancy

Once the user confirms the reason for suspension, the drug will be suspended, and the end date will be the date on which the suspend button is clicked.

(1) User clicks ‘Suspend’ and is prompted for the reason for suspending the drug



(2) Drug history is updated to show the date on which the drug was suspended



2.10.4 Possibility to remove a drug in the overview

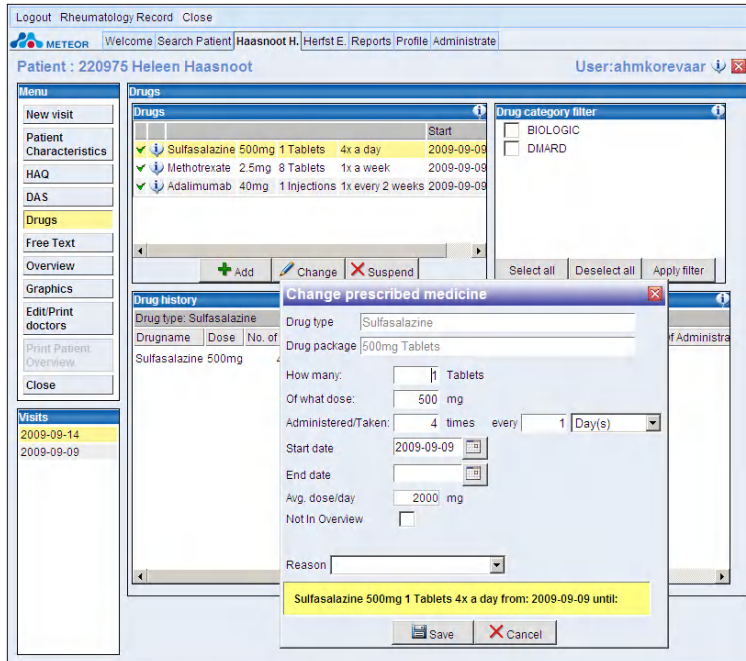
In the “change prescribed medicine” screen a checkbox ‘Not in Overview’ is added. With this box it is possible to remove a drug in the overview.

Reasons for using this functionality are for instance when a patient never took a prescribed drug or when a drug was entered by mistake.

If a drug is to be ‘removed’, the user should click on the appropriate drug on the drugs page. This will activate the ‘change’ and ‘suspend’ buttons. Clicking on the ‘change’ button will cause a dialog box to pop up, in which the user can tick the checkbox ‘not in overview’, fill in end date equal to start date.

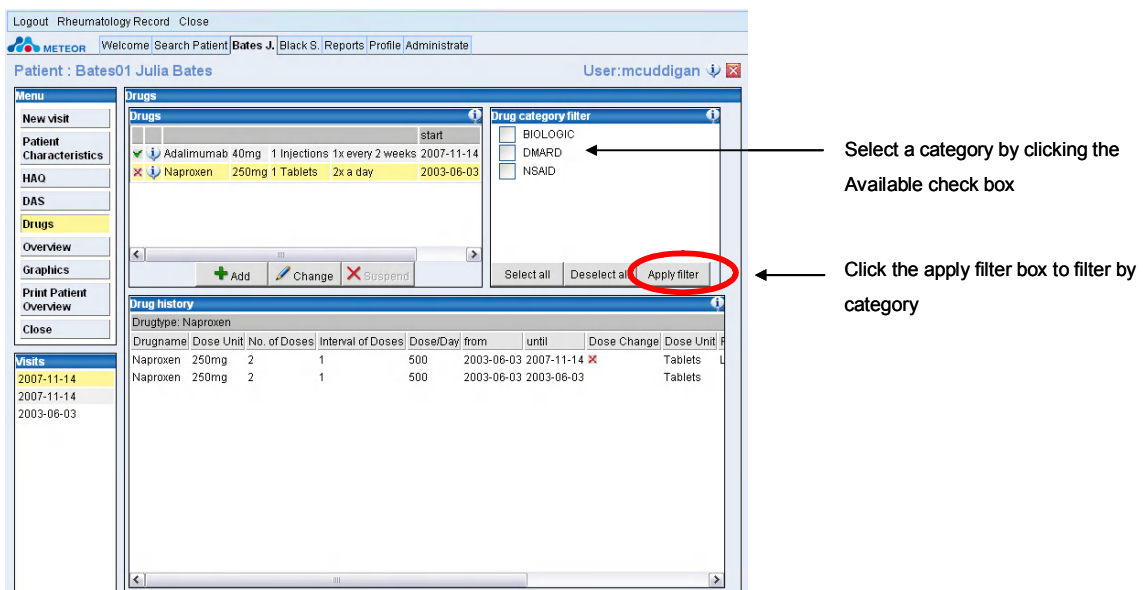
Important: When ticking the checkbox ‘Not in overview’ the user should fill in an end date equal to start date and choose for a reason either ‘Wrong Entry’ or ‘Drug Not Used’

When “Not in Overview” is ticked the drug will no longer be visible in the drug history, but the data will remain in the database.



2.10.5 Selecting drugs to view by category

The user can select a category to view the history of prescribing for all drugs of that type. It is also possible to select multiple categories to view combinations of drugs.



Logout Rheumatology Record Close

METEOR Welcome Search Patient Bates J. Black S. Reports Profile Administrate

Patient : Bates01 Julia Bates User:mcuddigan

Menu

- New visit
- Patient Characteristics
- HAO
- DAS
- Drugs**
- Overview
- Graphics
- Print Patient Overview
- Close

Drugs

Drugs

Adalimumab 40mg 1 Injections every 2 weeks 2007-11-14 start

Drug category filter

- BIOLOGIC
- DMARD
- NSAID

Select all Deselect all Apply filter

+ Add Change X Suspend

Drug history

Drugtype: Adalimumab

Drugname	Dose Unit	No. of Doses	Interval of Doses	Dose/Day	from	until	Dose Change	Dose Unit	Reason
Adalimumab 40mg	1	14		2.9	2007-11-14				Injections

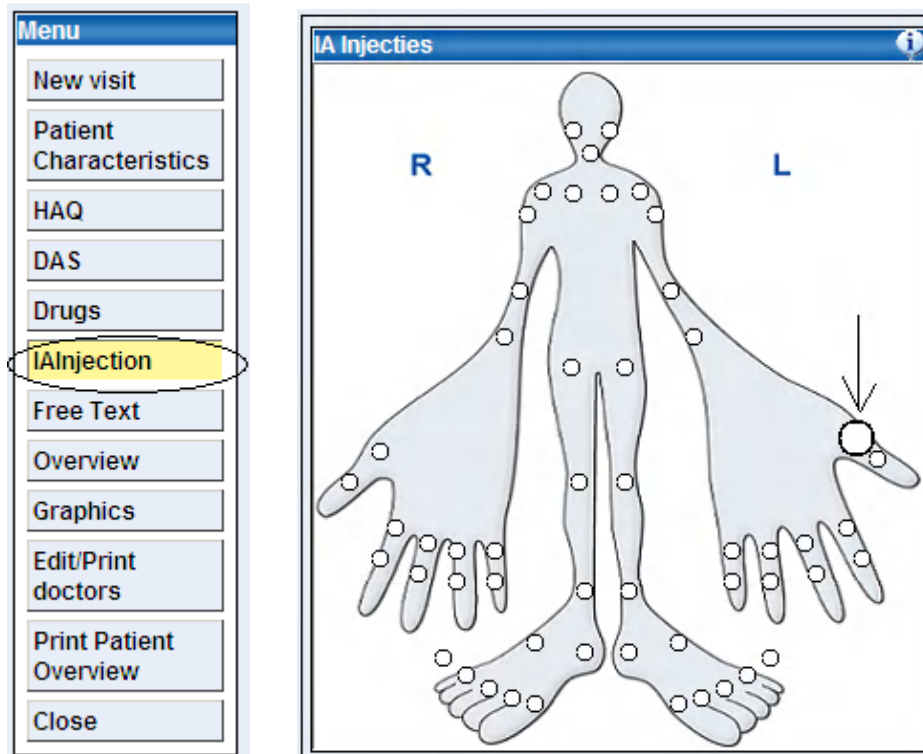
History and drug view becomes filtered
By the category selected

Multiple filters can be selected in order to see more than one class of drug at a time.

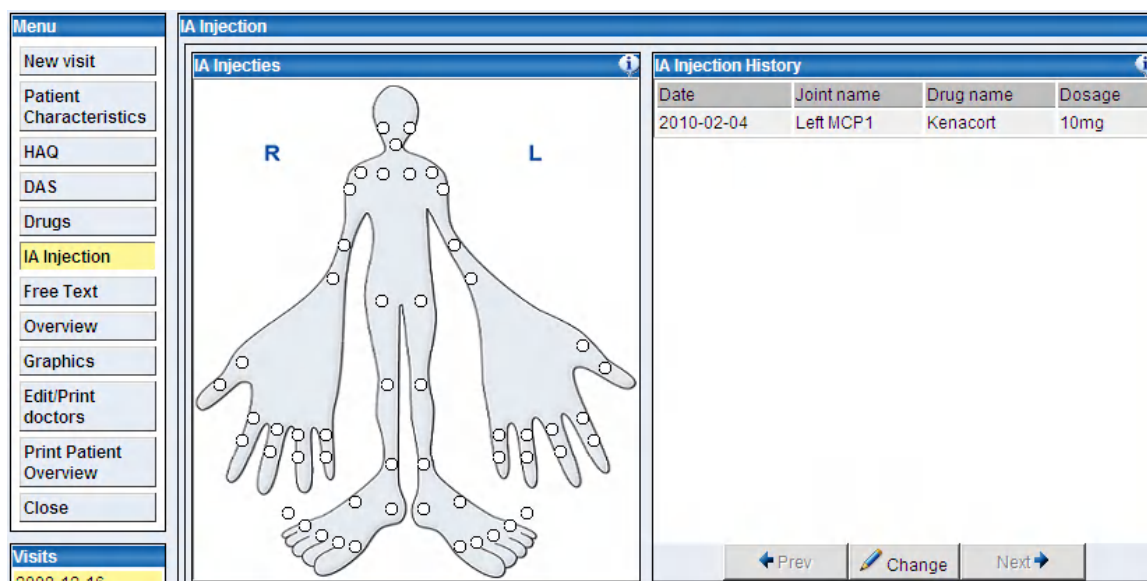
2.11 Recording Intra Articular injection

2.11.1 Selecting a joint

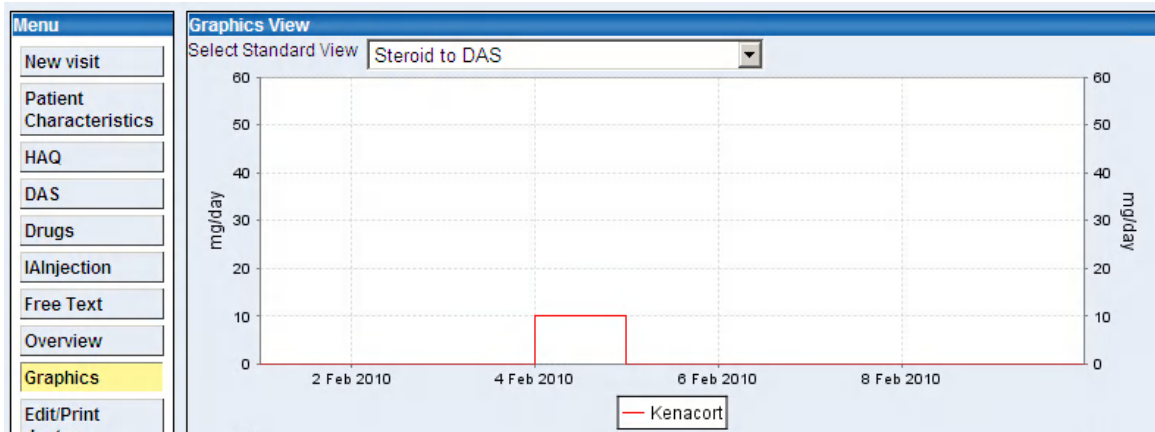
By clicking the selected joint a pop up screen will appear to add a drug.



After saving the drug the injection history (date, joint name and prescribed drug) will appear in the overview on the right side of the screen.



The prescribed drug will also be displayed in the drugs module and in the Graphics module.



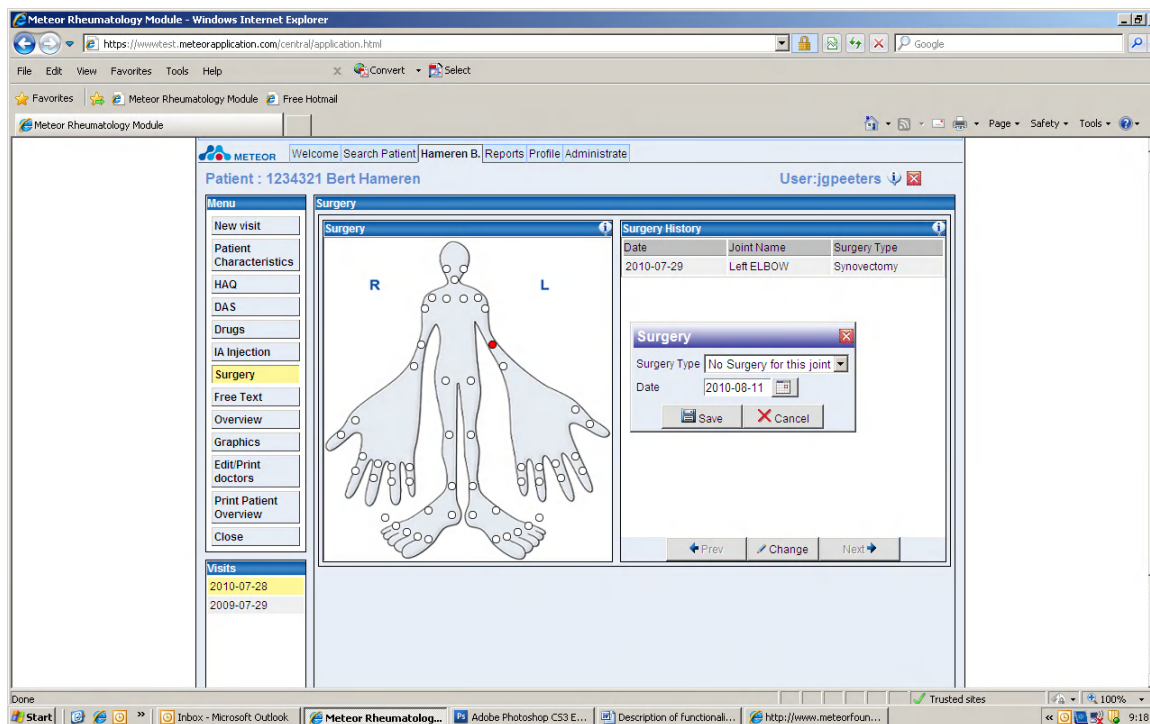
Please be aware that visits in the menu only refer to visits with DAS scores.

2.12 Recording Surgery

2.12.1 Selecting a surgery

By clicking a joint a screen pops up.

In this screen the user can select the surgery type and enter the date of the surgery.



Possible surgeries are:

Arthrodesis, Lavage, Synovectomy, Tenosynovectomy, Other and Joint replacement.

On top of these there are 2 specific surgeries:

- Neck Surgery: this option can only be selected when selecting the Spine joint
- Joint replacement revision: this option can only be selected after registering a pre-registered Joint replacement.

2.12.2 Overview of all surgeries

After registering an Arthrodesis, Lavage, Synovectomy, Tenosynovectomy, Other or Neck surgery, the selected joint is shown in **red**.

When a “Joint replacement” or “Joint replacement revision” surgery is selected, the joint is shown in **black**.

In the Surgery history an overview of all registered surgeries are ordered by date.

Patient : 1234321 Bert Hameren User:jgpeeters

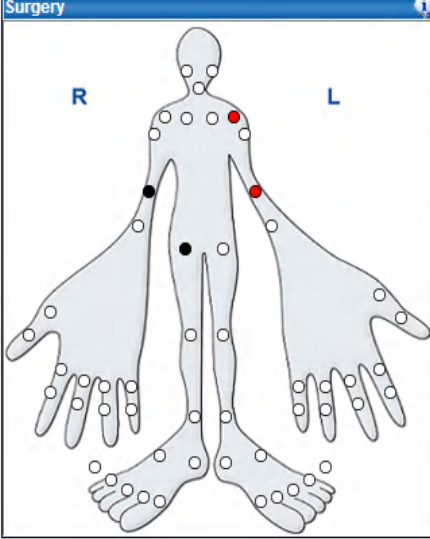
Menu

- New visit
- Patient Characteristics
- HAQ
- DAS
- Drugs
- IA Injection
- Surgery**
- Free Text
- Overview
- Graphics
- Edit/Print doctors
- Print Patient Overview
- Close

Visits

- 2010-07-28**
- 2009-07-29

Surgery



Surgery History

Date	Joint Name	Surgery Type
2010-08-11	Right ELBOW	Joint Replacement
2010-08-11	Left AC	Lavage
2010-08-11	Right HIP	Joint Replacement
2010-08-11	Right ELBOW	Joint Replacement Revision
2010-07-29	Left ELBOW	Synovectomy

← Prev Change Next →

2.12.3 Replacement surgeries affecting the DAS module

All registered “Replacement” and “Replacement revision” are visible in the DAS module. Replaced joints can no longer be selected for both Tender and Swollen DAS assessment.

METEOR Welcome Search Patient Hameren B. Reports Profile Administrate

Patient : 1234321 Bert Hameren User:jgpeeters

Menu

- New visit
- Patient Characteristics
- HAQ
- DAS**
- Drugs
- IA Injection
- Surgery
- Free Text
- Overview
- Graphics
- Edit/Print doctors
- Print Patient Overview
- Close

Visits

- 2010-08-11
- 2010-07-28
- 2009-07-29

Disease Activity Score (DAS) [visit:Today]

Tender Joints (53)

Swollen Joints (44)

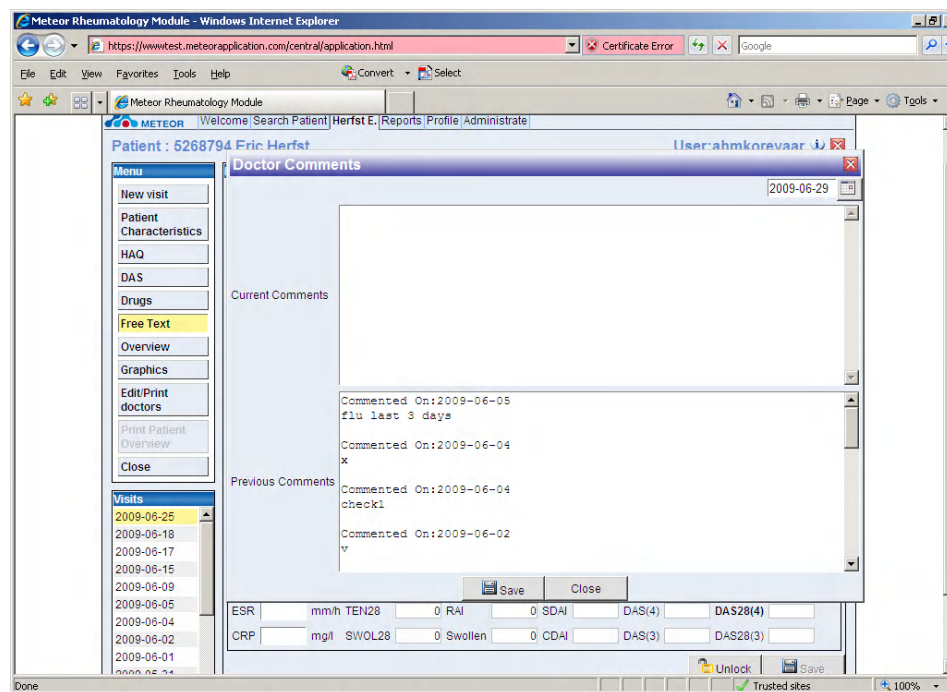
← Prev Page 1 of 2 Next →

Details

ESR	<input type="text"/>	mm/h	TEN28	<input type="text"/>	0	RAI	<input type="text"/>	0	SDAI	<input type="text"/>	DAS(4)	<input type="text"/>	DAS28(4)	<input type="text"/>
CRP	<input type="text"/>	mg/l	SWOL28	<input type="text"/>	0	Swollen	<input type="text"/>	0	CDAI	<input type="text"/>	DAS(3)	<input type="text"/>	DAS28(3)	<input type="text"/>

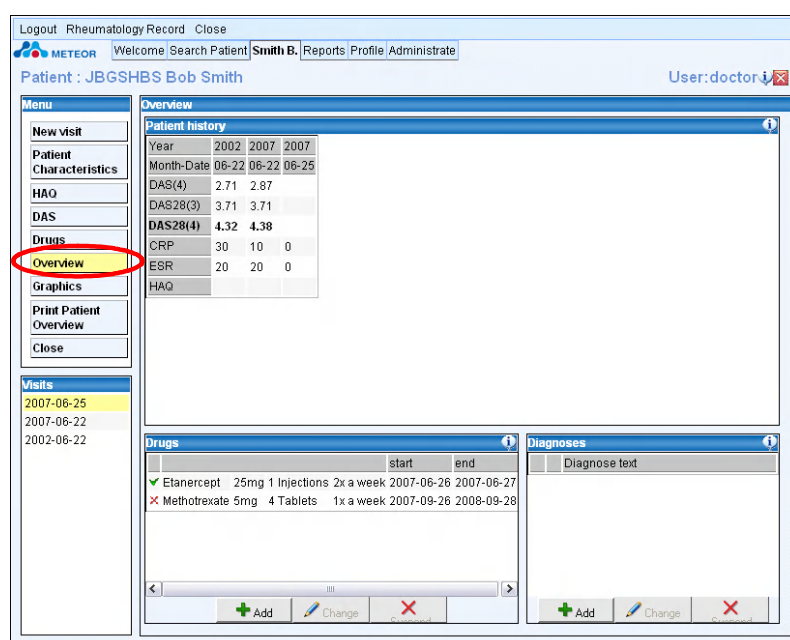
2.13 Free Text

The new module “free text” can capture free text information of the patient. This information will be stored locally and will not be sent to the central database.



2.14 Overview data and Co-morbidity functions

Users access the overview page by clicking the overview button, as shown:



The overview page is split into three functional sections, drugs summary, disease assessment history (patient history) and co-morbidity entry (diagnosis).

The drugs summary is identical to the equivalent section in the medicines page (refer to guidance in section 3.9).

2.14.1 Patient Summary

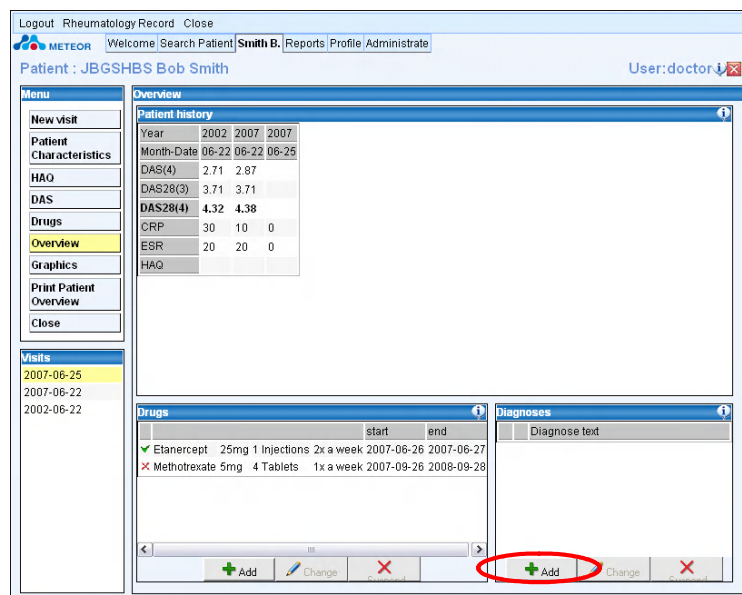
The patient summary shows the overall scores for clinical assessment data as follows:

Parameter	Variable/Always present
DAS(3)	Variable
DAS(4)	Variable
DAS28(3)	Variable
DAS28(4)	Always present
SDAI	Variable
CDAI	Variable
ESR	Always present
CRP	Always present
HAQ	Always present

The items marked as "variable" in the table above will be visible if the user has selected to display these items in their personal profile selection, as described in section 3.3.2.

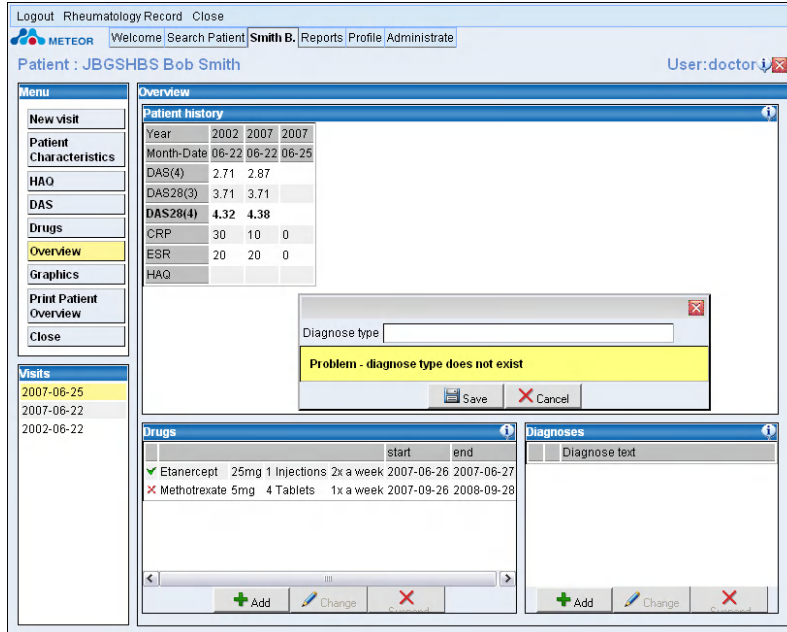
2.14.2 Co-morbidity diagnosis

The user can add a diagnosis by clicking the add button, as shown below.

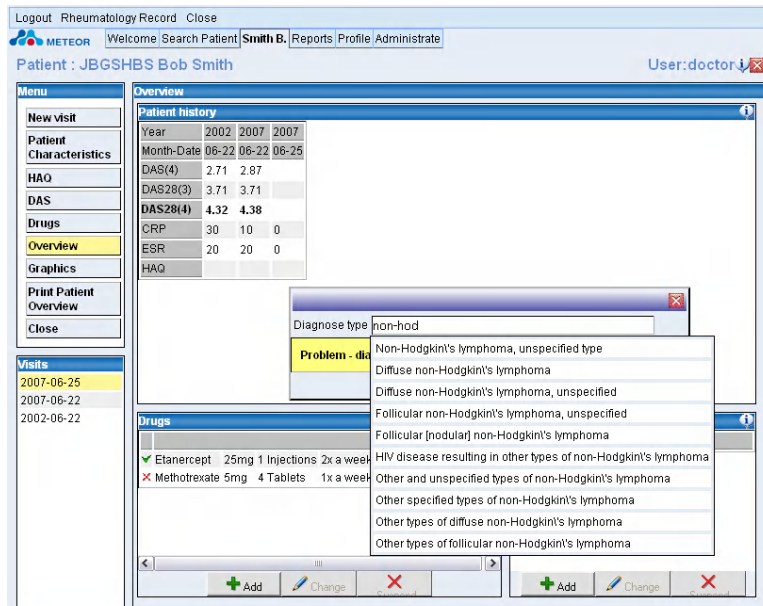


The application uses a standard ICD-10 list for diagnosis and terminology. It can accept diagnoses in text form, or the ICD-10 codes.

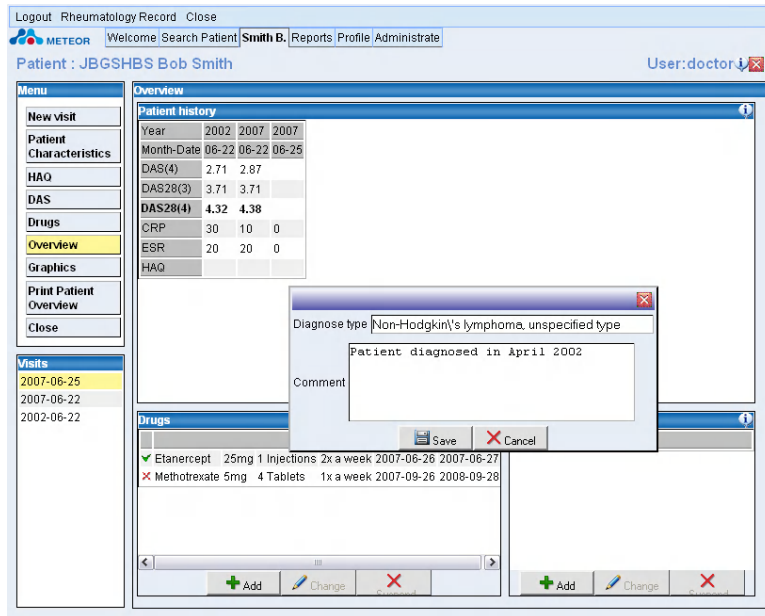
Clicking the add button initiates the entry box:



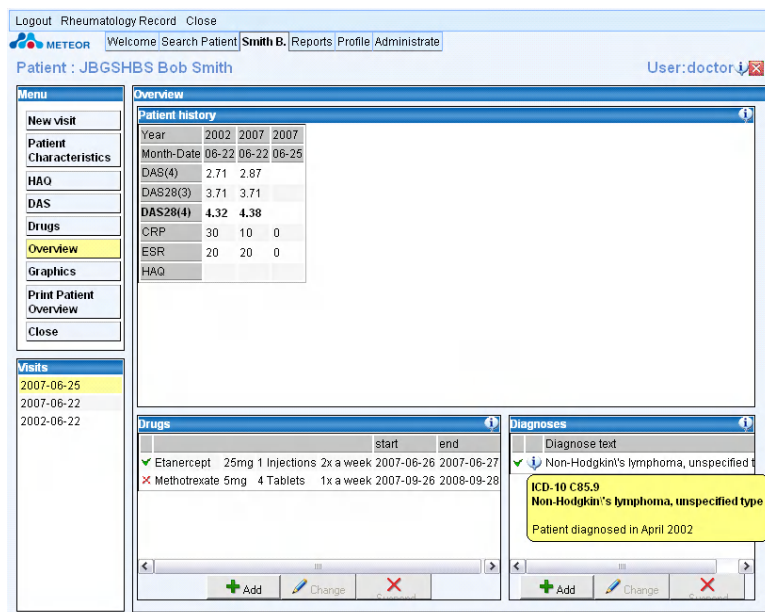
The user can then enter the diagnosis - the application has search ahead functionality and will match closest available entries as the user types. This is shown below for a user entering non-Hodgkins Lymphoma:



The entry is selected and the user can enter additional comments, if required:



Once the entry is saved, the entry is visible in the diagnosis window. Clicking on the information button reveals the additional comments, as shown:

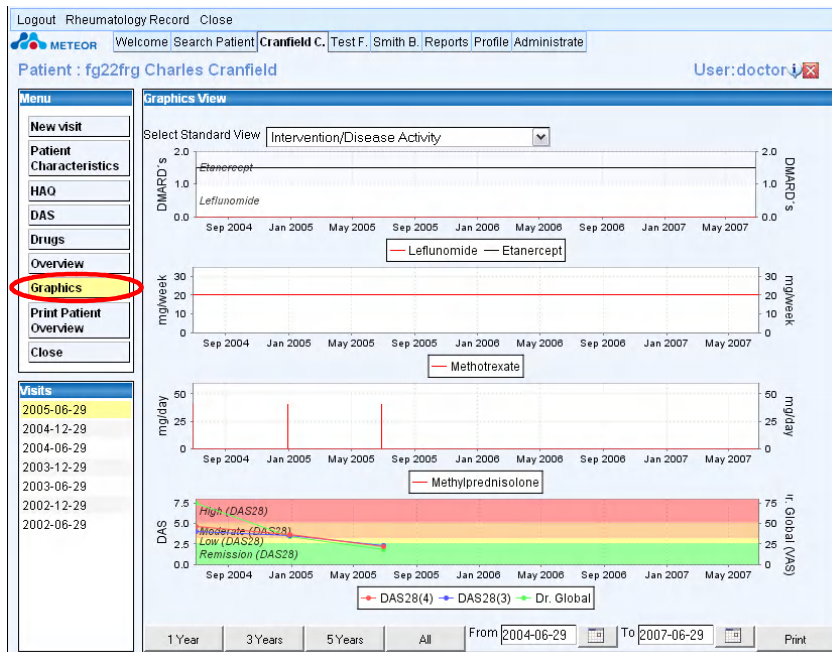


The diagnosis can be changed or suspended using the change and suspend buttons. If a diagnosis is suspended, it will not be possible to change or re-activate that diagnosis again. Should it become necessary to re-enter a diagnosis that had previously been suspended, the user should select the condition and enter the reason for re-entering the diagnosis in the comments field.

To change a diagnosis, the user should overwrite the new diagnosis to trigger the search ahead function.

2.15 Disease activity and medication graphs

The graphics page is displayed by clicking on the graphics menu button, as shown:



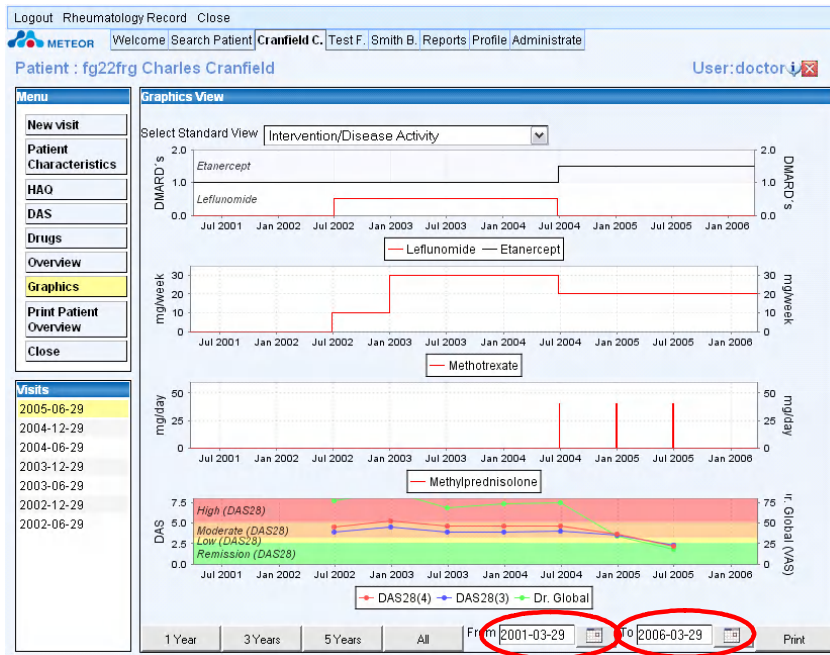
On entering this page, the application will automatically display data for a 3 year period.

2.15.1 Displaying graphs over a specified time period

The graphs page has some buttons to allow quick viewing of the graphs over periods of 1 year, 3 years or 5 years. Clicking the buttons will automatically align the graphs to these periods.

The "All" button will display all data available for any graph - the time periods will therefore become desynchronised if there is more data available for one graph than another.

To display the graphs over a specified timeframe, the dates should be entered in the from and to boxes, as indicated in the diagram below - the time period shown here is from March 2001 until March 2006:

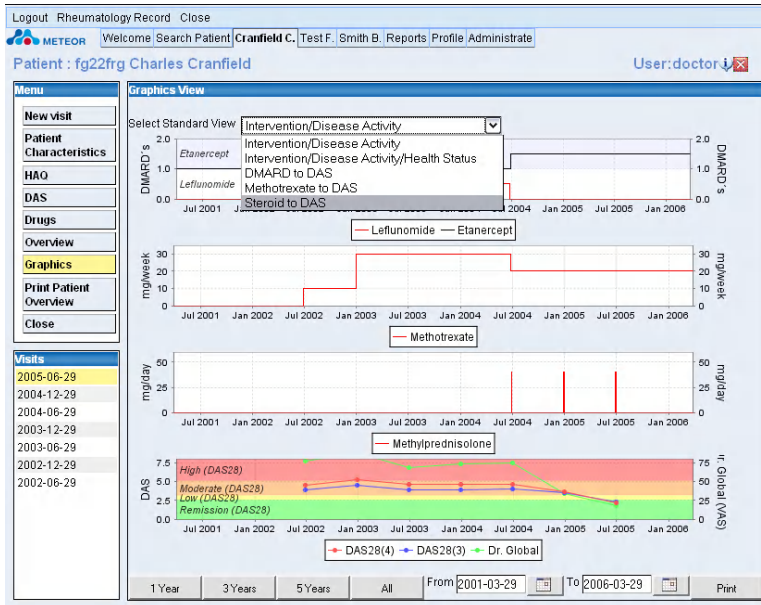


2.15.2 Selecting graph types to display

There are 5 different graph types available to display within the application:

Drop down menu reference	Graph Information
Intervention/Disease Activity	This is the default view - 4 graphs are displayed: DMARD vs Time Methotrexate vs time Steroid vs Time DAS/Dr Global vs Time
Intervention/Disease Activity/Health Status	DMARD vs Time Methotrexate vs time Steroid vs Time DAS/Dr Global vs Time HAQ vs Time
DMARD to DAS	DMARD vs Time DAS vs Time
Methotrexate to DAS	Methotrexate vs time DAS vs Time
Steroid to DAS	Steroid vs Time DAS vs Time

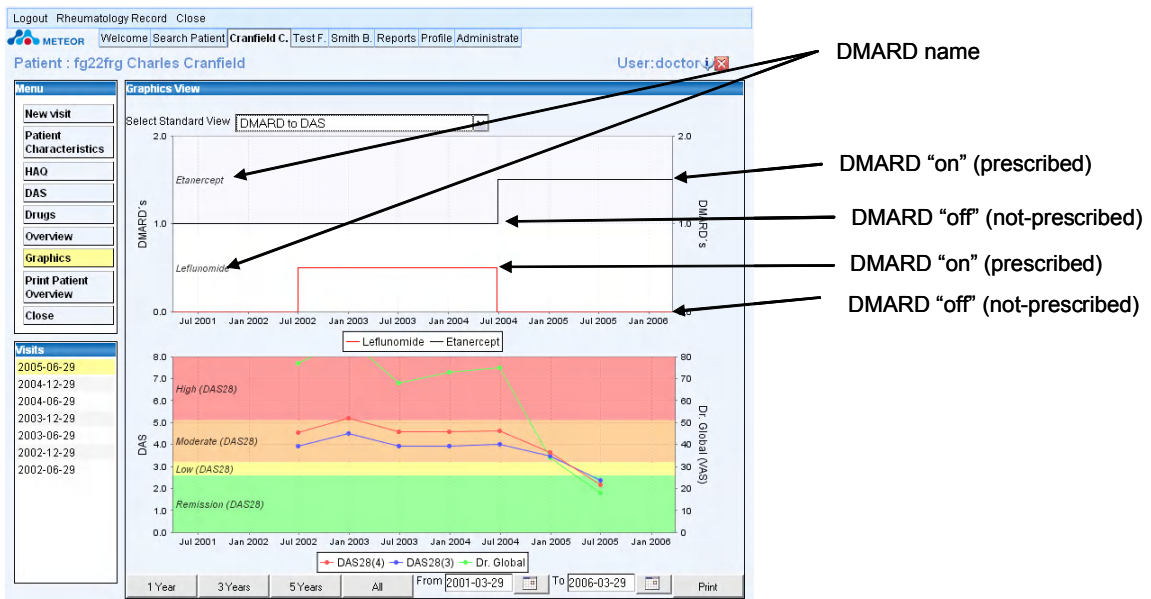
The graphs to display are selected from the drop down menu, as shown in the diagram below:



Each of the graphs is now explained in turn.

2.15.3 DMARD vs Time

The DMARD vs time graph is shown below, in the DMARD to DAS view:



The DMARD graph does not show medication dose information and is binary in its representation, with the drug being "on" or "off".

The graph is designed on the basis that a patient will not be on more than 3 or 4 DMARDs at any one point in time.

2.15.4 Methotrexate vs Time

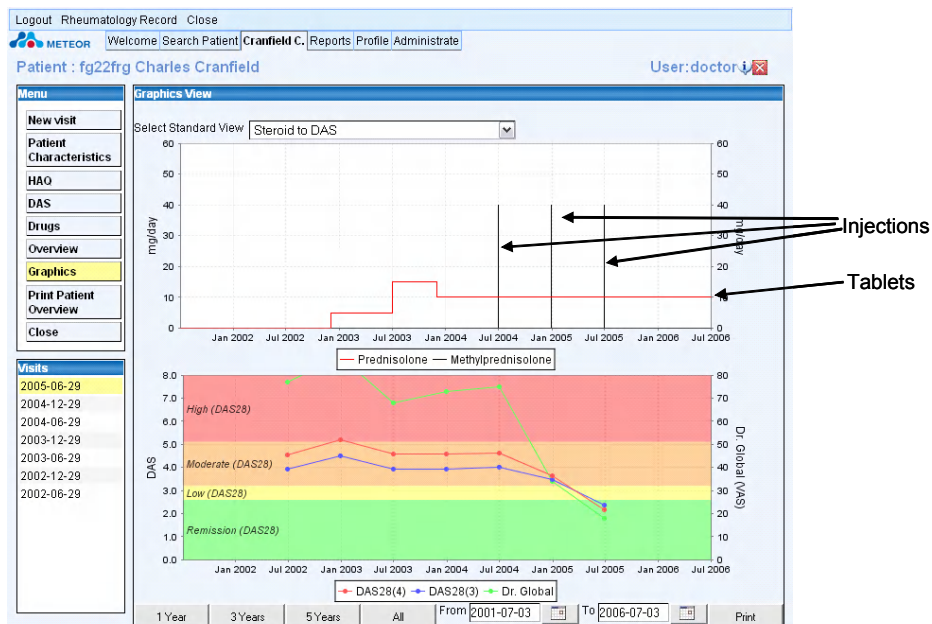
The methotrexate graph is shown below, in the methotrexate vs DAS view:



The graph displays the methotrexate dosing in mg per week.

2.15.5 Corticosteroid vs Time

The corticosteroid graph is shown below, in the steroid vs DAS view:



As shown in the graph, injections display as a single vertical line to allow the injections to be quickly identified in the graph.

The dosing in the steroid graph is standardised against the prednisolone scale, as shown in the table below:

Corticosteroid	Conversion factor
Cortisone	5
Hydrocortisone	4
Methylprednisolone	0.8
Triamcinolone	0.8
Dexamethasone	0.15
Betamethasone	0.13

Reference: predniso(lo)ne (= 1).

Source: *Merit Foundation*

2.15.6 Choosing the DAS graph

The DAS graph displayed can be personalised, as explained in profile set up in section 3.3.2

The DAS28 graph has coloured boundaries to show the high, moderate, low and remission cut offs and is the recommended view.

If the user wishes to display combined measurements (for example DAS 28 (3), DAS28(4), DAS(3) and DAS(4)) the boundaries will be removed, since the boundaries are different depending on the measure used.

The Dr Global measurement is always visible and cannot be removed from the graphs display.

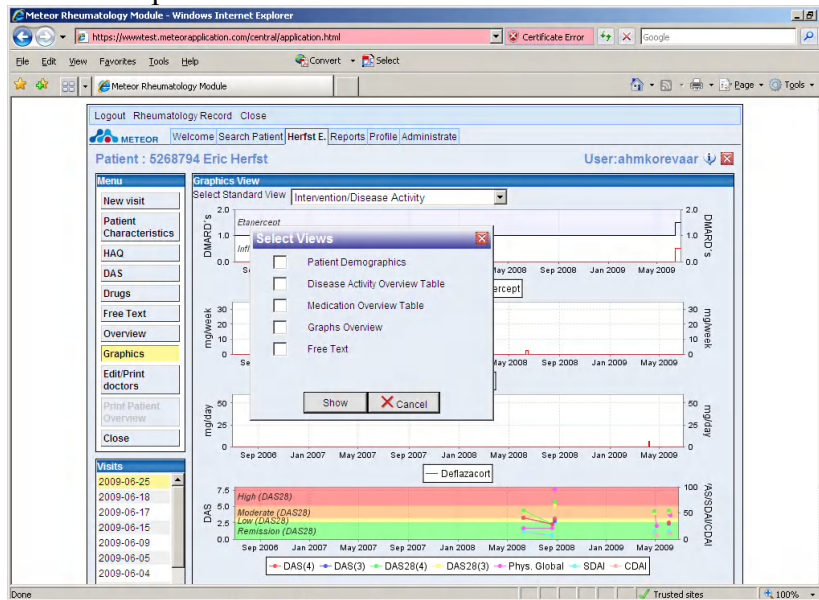
2.16 Printing Functions

The Meteor application has three printing options.

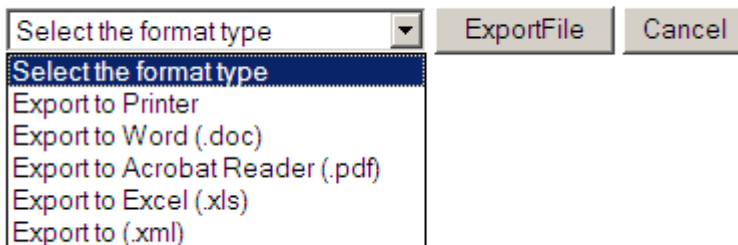
2.16.1 Edit/Print Doctors

When clicking the edit/print doctors button the 'select views' menu will be opened as shown below. Views to be selected are:

- Patient Demographics
- Disease Activity Overview Table
- Medication Overview Table
- Free Text
- Graphs Overview



After ticking the boxes the user can select a format type to export these data to:



Word and Excel have a possibility to edit these data.

2.16.2 Print Patient Overview

If hospital policy permits this, it is possible to allocate rights to patients to print their own data:

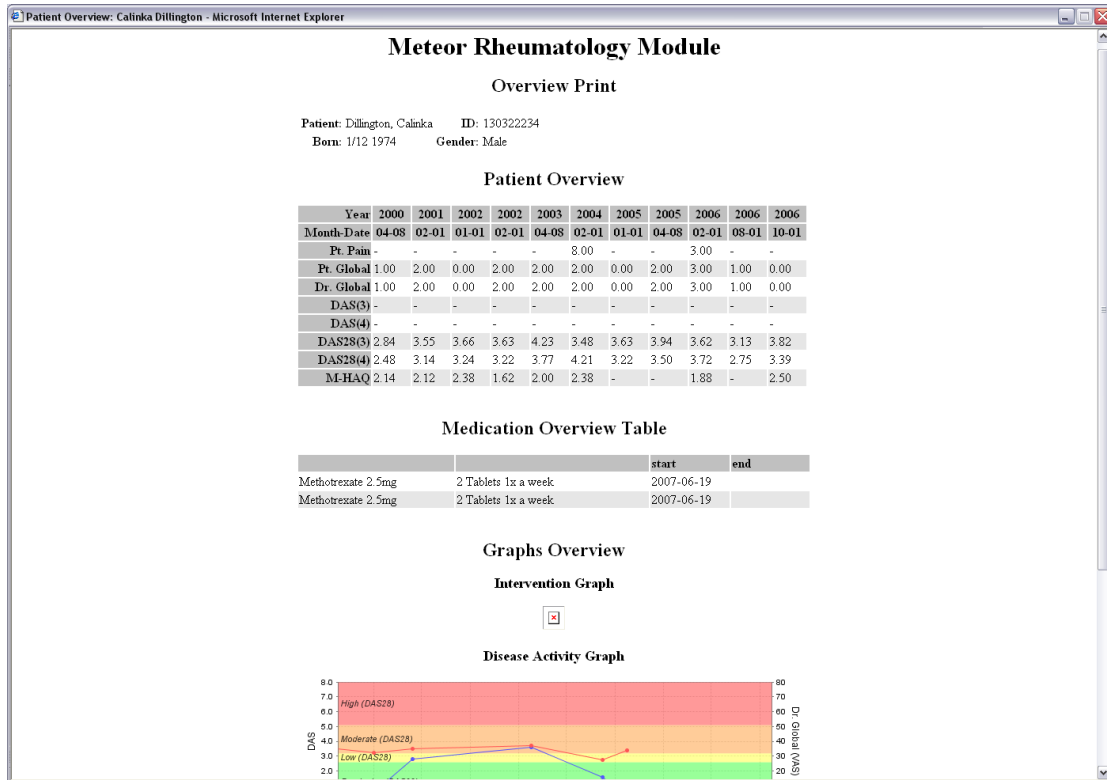
1. Patient Demographics .
2. Disease Activity Overview Table
3. Medication Overview Table
4. Graphs Overview

The print patient overview button is activated from the main menu in the application. as shown in the diagram below.

The overview automatically defaults to show a 3 year period and displays the patient summary, intervention and DAS graphs.

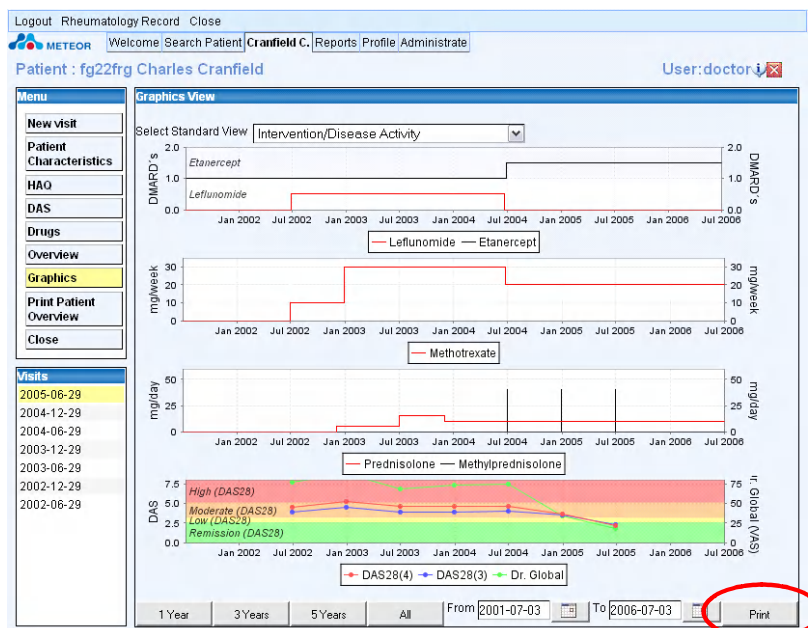
The screenshot displays the METEOR application interface for a patient named James Douglas. The main menu on the left includes options like 'New visit', 'Patient Characteristics', 'HAO', 'DAS', 'Drugs', 'Overview', 'Graphics', 'Print Patient Overview' (circled in red), and 'Close'. The 'Visits' section lists dates from 2007-11-23 to 2006-06-02. The main content area shows the 'Disease Activity Score (DAS) [visit:2006-06-02]' with two diagrams: 'Tender joints (53)' and 'Swollen joints (44)'. The 'Details' section at the bottom provides clinical data: ESR 45 mm/h, CRP 12.2 mg/l, RAI 9, SDAI 22.6, DAS(4) 3.58, DAS28(4) 5.37, Swollen 4, CDAI 21.4, DAS(3) 3.36, and DAS28(3) 4.99. Navigation buttons for 'Prev', 'Page 1 of 2', and 'Next' are visible.

An example of the report to be printed is shown below:

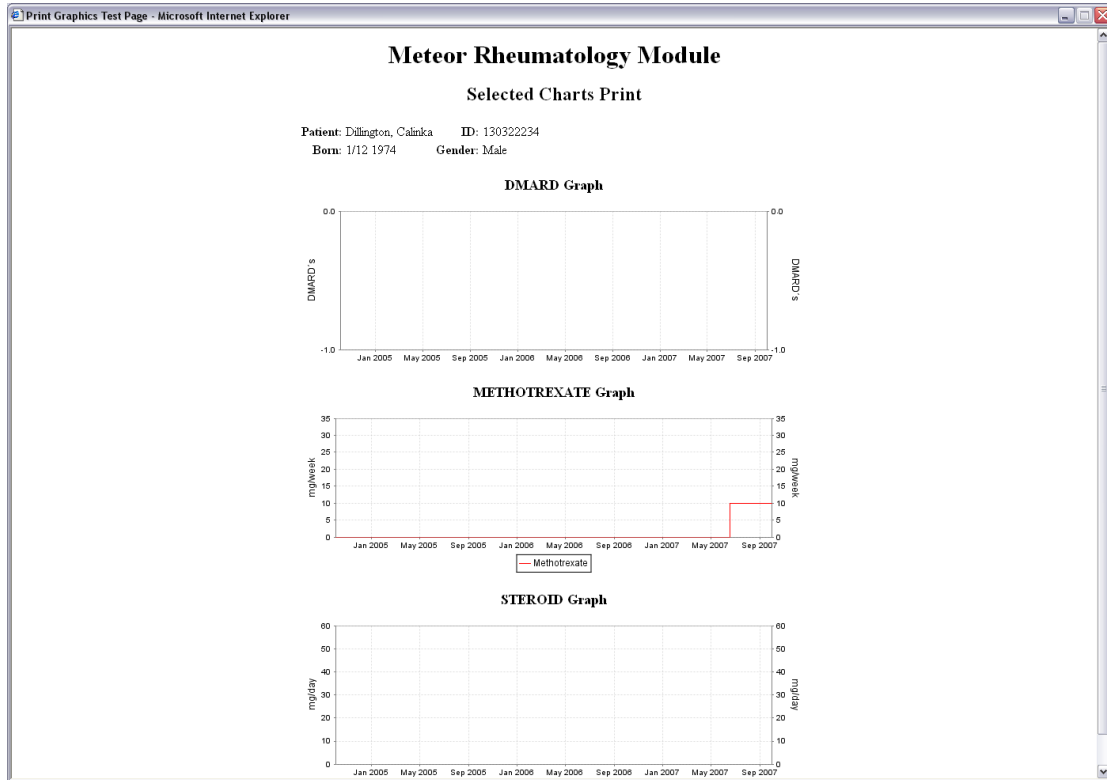


2.16.3 Graph print functions

The graphics page has a print function that allows the user to print whatever is on the screen at the time of activating the button. This allows the user to display medication and DAS summary data for any chosen period.



When the user selects the 'print' option, the application will format the graphs for printing. An example of the formatted document ready for printing is shown below:



3 Download.

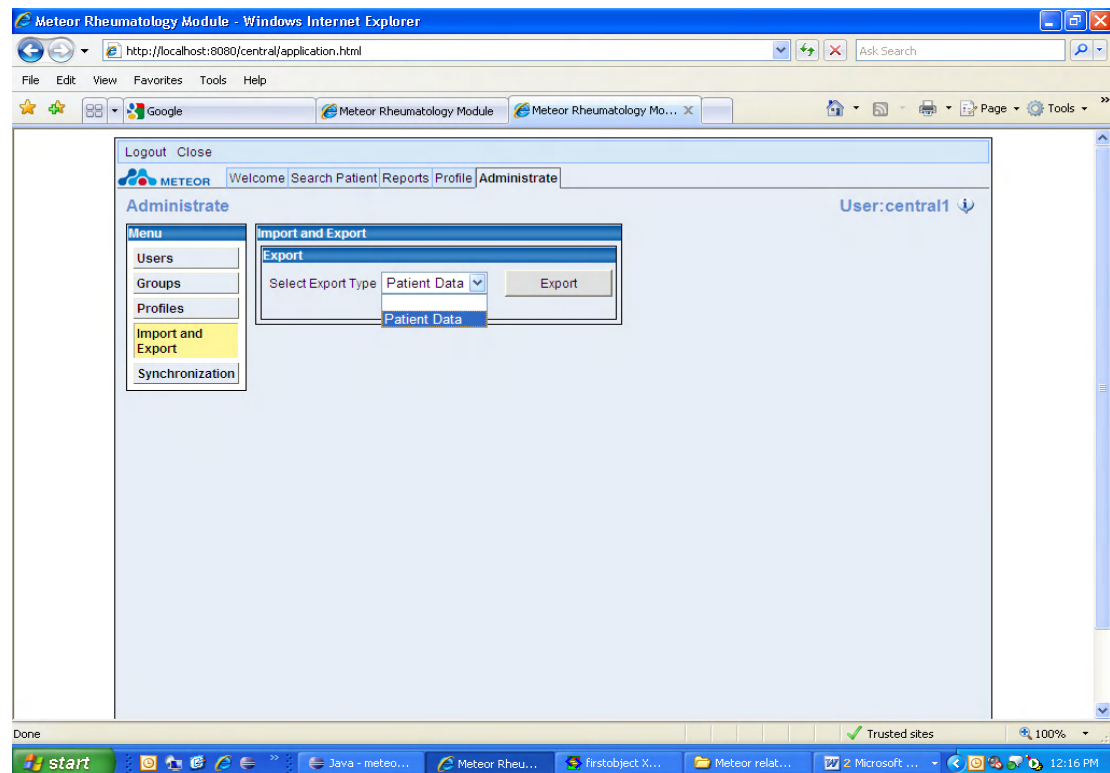
3.1 Download

The **administrator** has the right to download patient data of his site in a XML format..

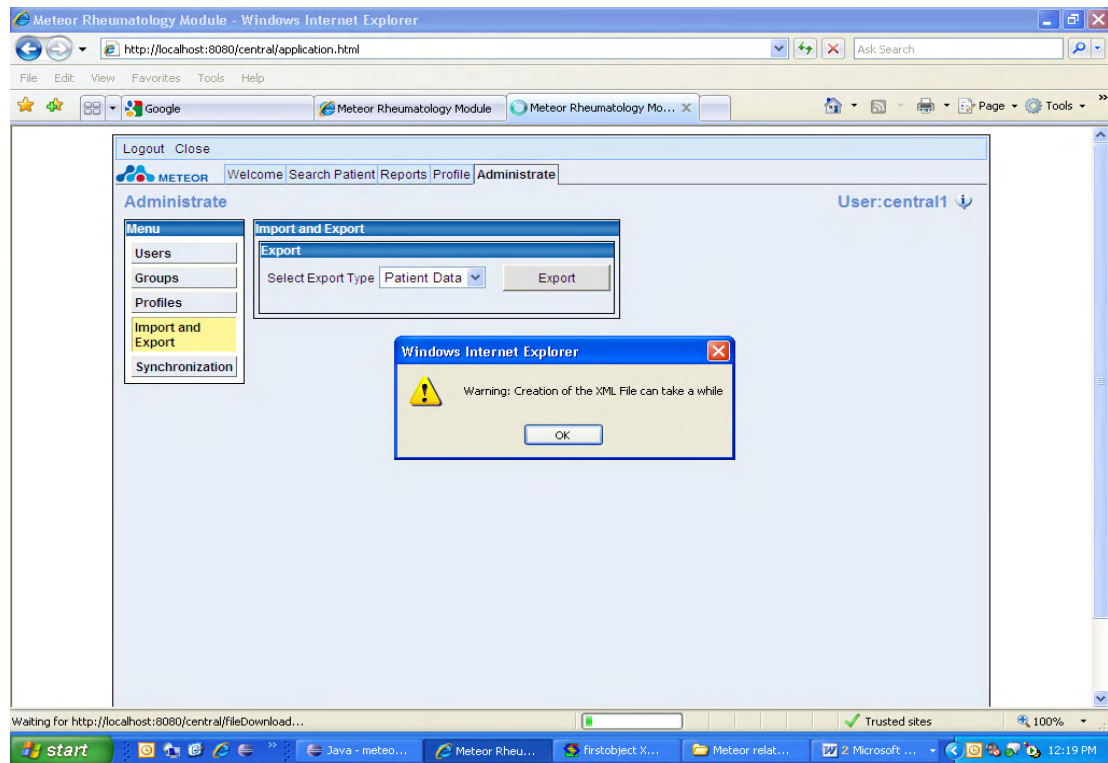
3.1.1 Download site data

Click the “Administrate” tab, click on “Import and Export” menu button.

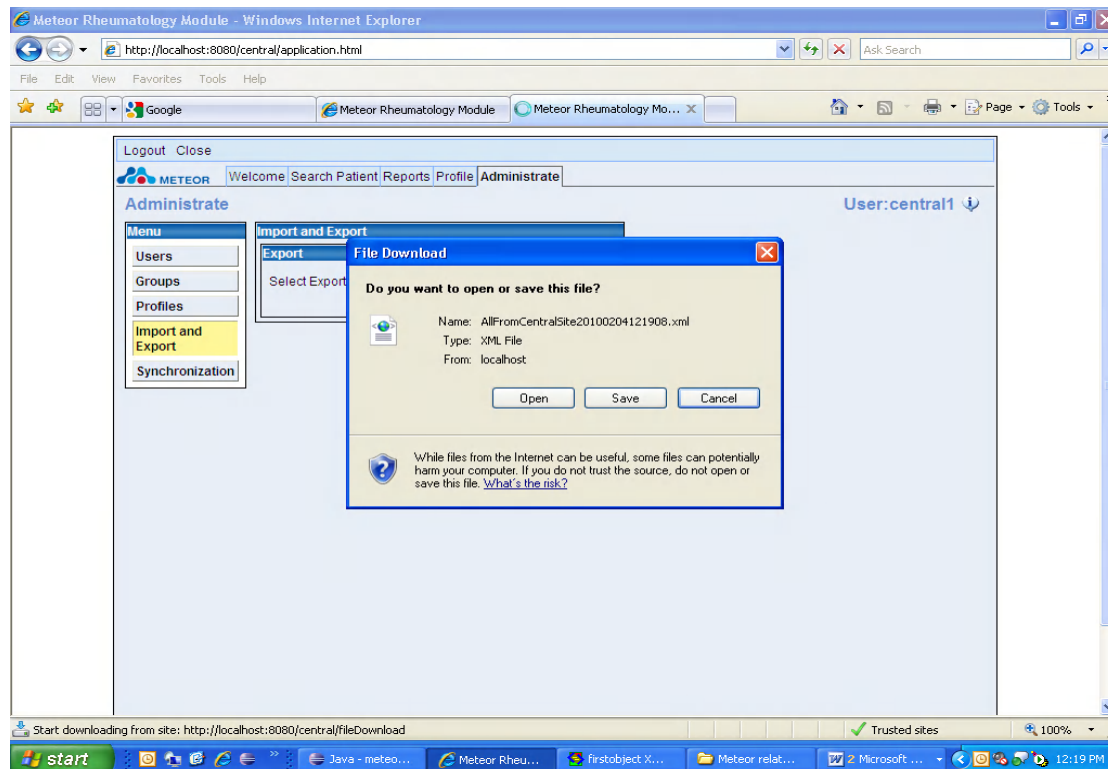
The Import and Export screen appears, in which select export type option is provided. Select Patient Data as below. Click on Export button.



A warning pop-up is shown on click of Export.

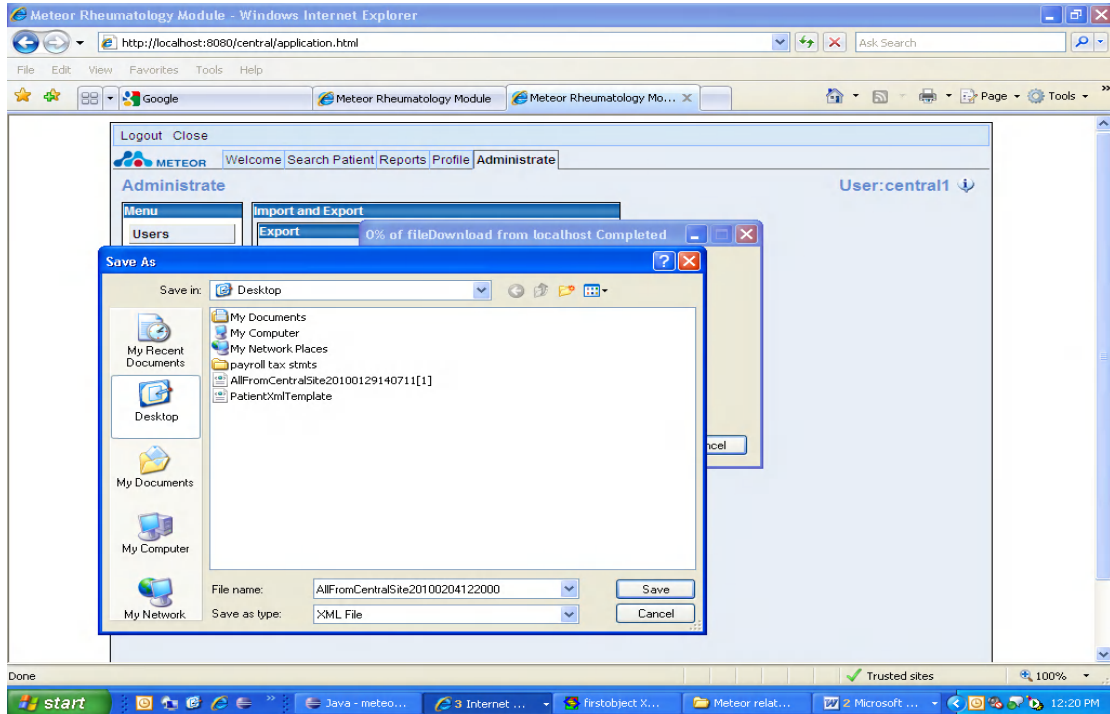


By clicking OK a File Download dialog box is displayed which provides the options for either opening the XML file or saving it to a destination location or cancelling the operation.



3.1.2 Saving data

By clicking “save”, a dialog box is displayed to save the XML file at the desired location.



After selection of the location, a download dialog box opens and shows the download progress.

