The Modules: Hip and Knee Arthroplasty

This chapter covers the features of both of the arthroplasty modules in Socrates: Hip Arthroplasty and Knee Arthroplasty. Both primary and revision procedures are described, including Total Joint Replacements, Uni-Compartmental Surgeries and Resurfacing Procedures.

The program can record all the relevant details about the surgery, implants used, details of revisions and reoperations, causes of failure, radiology follow-up details, complications, and it includes all the commonly used patient outcomes scores.

Don't be daunted by what you may consider as too much data to collect when you first look through the various screens. You can select from a lot of options, from the very brief to the very detailed.

It's hard to find a balance and provide a system that gives everyone what they want. Some of you will want to record detailed information about all of your procedures if your focus is collecting data for publication. Others of you will throw your arms up in horror at this level of detail, and will just want to use the program to track what you've done by diagnosis and procedure name, (and maybe any complications and a patient score to make sure that the patient was happy).

Also, since Socrates will be with you for your entire practice, what you use it for now will change over time: you may decide to follow different surgeries and patients in varying levels of detail.

Regulatory and reimbursement changes are ever-present, and it may become mandatory to follow some of the new procedures and implants in a different level of detail over time. Socrates will let you adapt your needs to cover all the possible scenarios. It's like a one-size-fits-all program, even if you do get a bit lighter or heavier over the years. There is quite a bit of *customisation* possible also, and we regularly add new fields and scores as they become necessary due to changes in technology and technique.

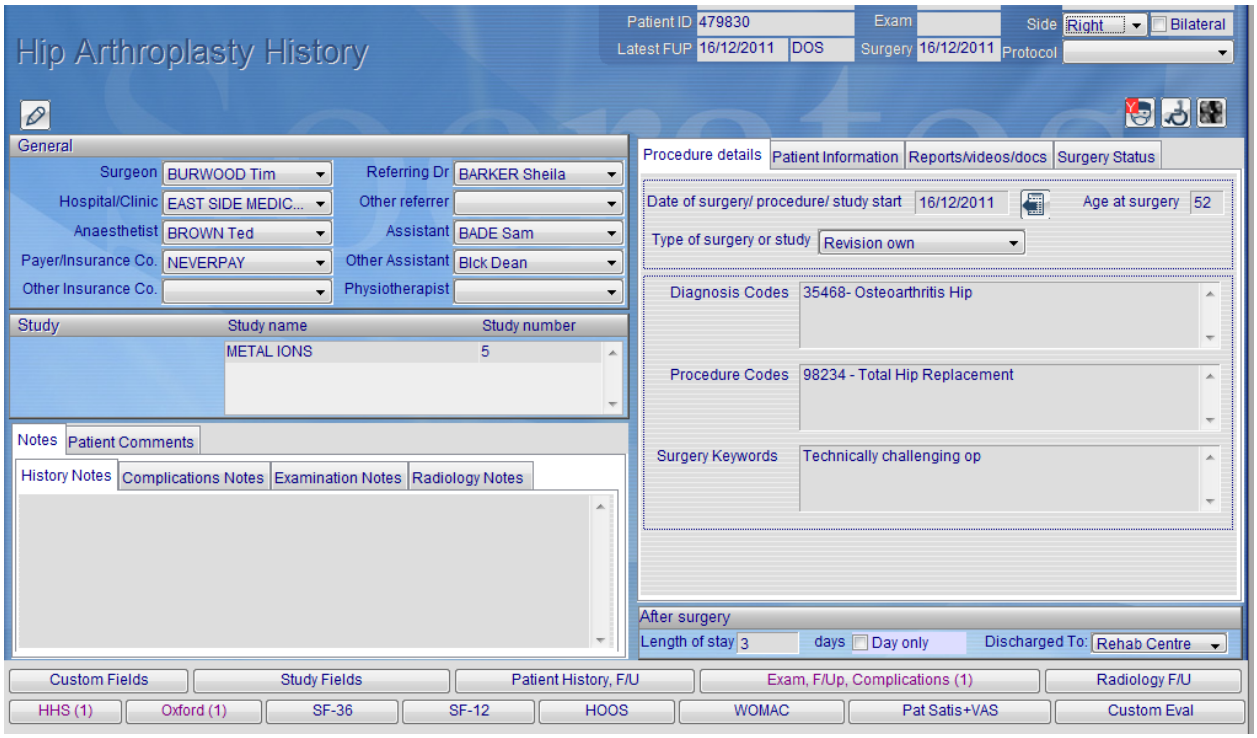
You can set up "Favourites" for some of the screens so that almost all the fields that you might routinely check for some procedures would be populated with one tick for those surgeries. Some procedures such as trauma and chondral lesions aren't set up for these features, they are not as common and there's not a lot that's routine about them. For those that are, you would then just change the details in the cases that are different from the Favourite, add anything non-standard (such as cause of OA, bone quality) and Save. This takes less than a minute. Set them up, one click, 30 seconds making any changes, and you have a huge amount of data captured, and an op report can be generated.

Take a bit of time to look around and decide what screen you are going to use for what procedures.

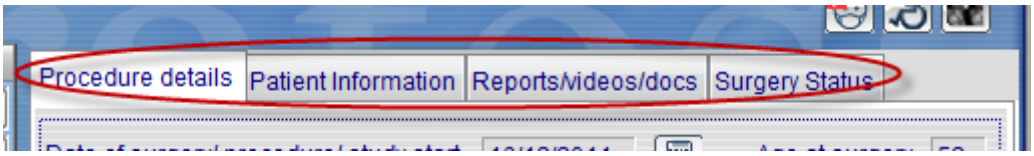
HISTORY SCREEN

The first section of this screen records **General Details**: Surgeon, Hospital, Assistants, Referring Dr and Insurance companies. Any **studies** the patient may be enrolled in are entered in the next window (these are created in the Set-Up screen).

Note: Any notes that may have been entered on the other screens are also displayed on the front screen.



On the right of this screen are 4 tabs.



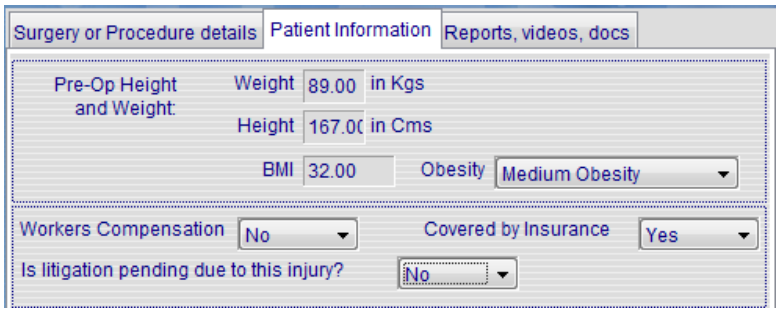
Surgery or procedure details

The first captures the date of the surgery. The follow ups delays are calculated from this date, i.e. 3 month, 1 year, 5 year follow up.

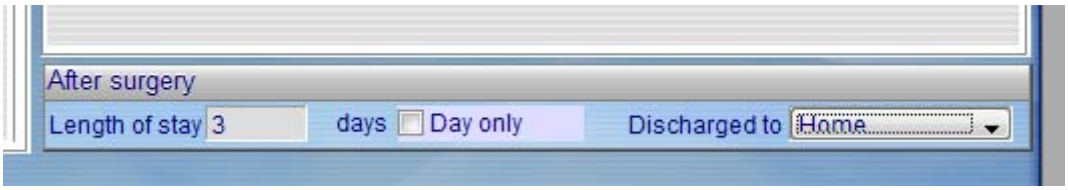
The diagnosis and procedure code can be entered using whatever codes are relevant for your country - CPT, ICD etc. More details about the diagnosis are on the main surgery screen. Some sites use only these codes to identify the type of surgery, some don't use them at all.

Patient information

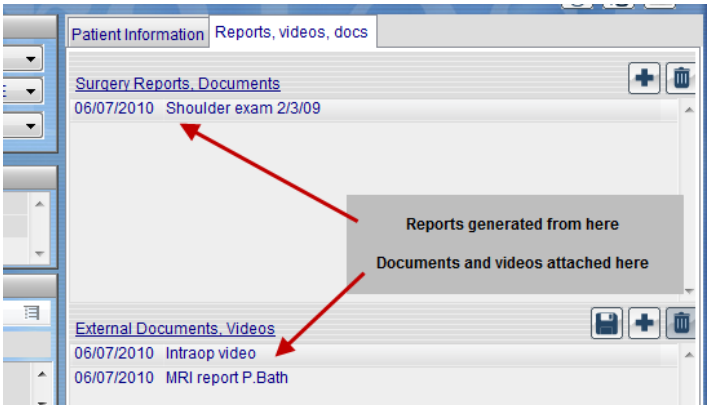
The next captures information about the history of the patient's weight and height, BMI (calculated by the program) workers comp, insurance status, litigation pending.



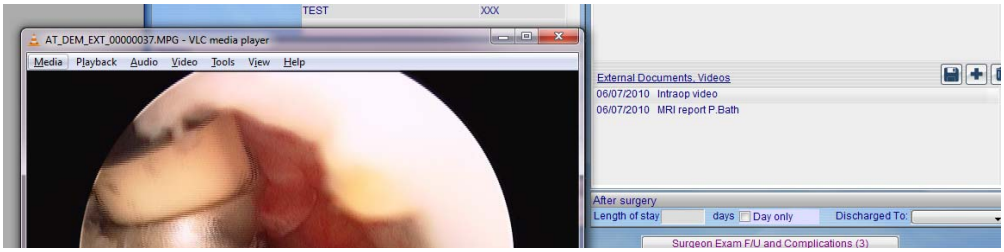
The length of stay and where the patient was discharged to is also is recorded on this screen.



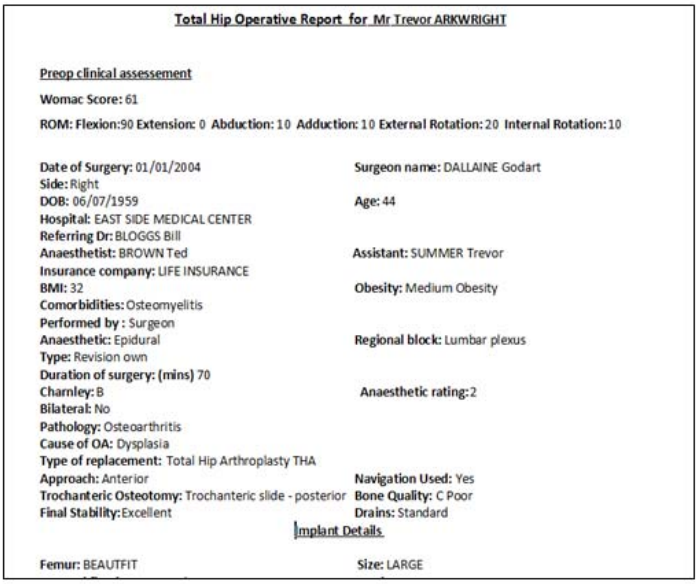
Reports, Videos and Documents



Videos and any type of **electronic document** (PDF, Word, Excel, etc.) can be imported and stored with the surgery record for viewing. Examples of what you might need to archive are pathology reports, consent forms, or even hard copies of the patients forms if you need to store these as an audit trail. Simply click on the **Add icon** to attach a document or video relevant to this surgery. See the chapter on X-rays and videos for more information.



Reports, such as **Surgery Reports** and **Examination Reports** can be generated from the fields you entered into the program. They are generated and stored in Socrates, exported as word or pdf documents or printed from this window. They work like a word processing document with a macro set up. As long as the data is entered into Socrates you can generate a report from it. Here's an section of a basic THA report.



Total Hip Operative Report for Mr Trevor ARKWRIGHT

Preop clinical assessement

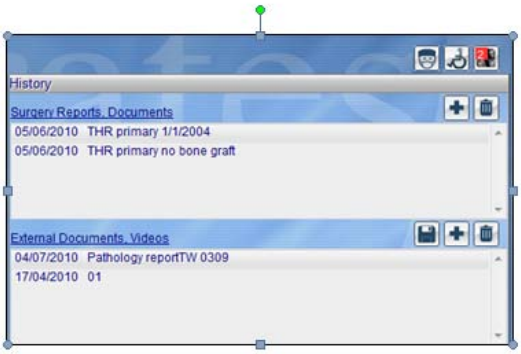
Womac Score: 61

ROM: Flexion:90 **Extension:** 0 **Abduction:** 10 **Adduction:** 10 **External Rotation:** 20 **Internal Rotation:** 10

Date of Surgery: 01/01/2004 **Surgeon name:** DALLAINE Godart
Side: Right
DOB: 06/07/1959 **Age:** 44
Hospital: EAST SIDE MEDICAL CENTER
Referring Dr: BLOGGS Bill
Anaesthetist: BROWN Ted **Assistant:** SUMMER Trevor
Insurance company: LIFE INSURANCE
BMI: 32 **Obesity:** Medium Obesity
Comorbidities: Osteomyelitis
Performed by : Surgeon
Anaesthetic: Epidural **Regional block:** Lumbar plexus
Type: Revision own
Duration of surgery: (mins) 70
Charnley: B **Anaesthetic rating:** 2
Bilateral: No
Pathology: Osteoarthritis
Cause of OA: Dysplasia
Type of replacement: Total Hip Arthroplasty THA
Approach: Anterior **Navigation Used:** Yes
Trochanteric Osteotomy: Trochanteric slide - posterior **Bone Quality:** C Poor
Final Stability: Excellent **Drains:** Standard

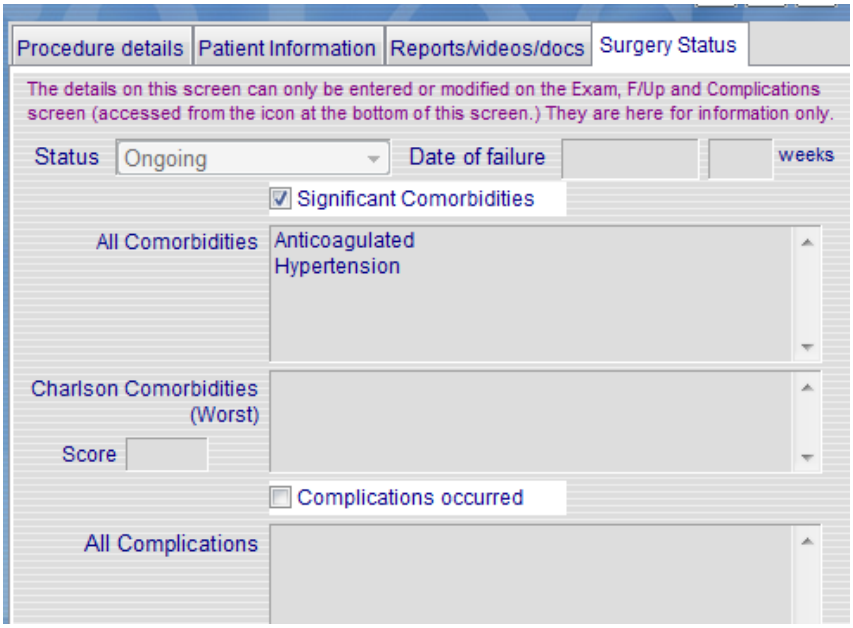
Implant Details

Femur: BEAUTFIT **Size:** LARGE

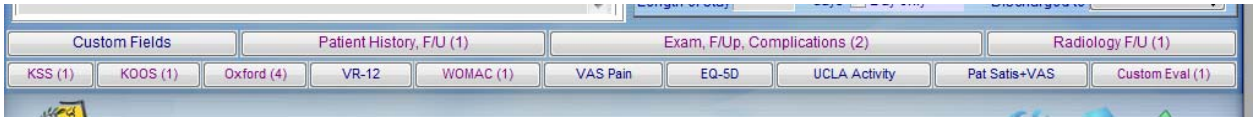


Surgery status

This a display only window to allow users to easily view the current status of the surgery (ongoing,failed etc) and any comorbidities and complications which may have occurred. These data are entered in the surgeon examination screen.



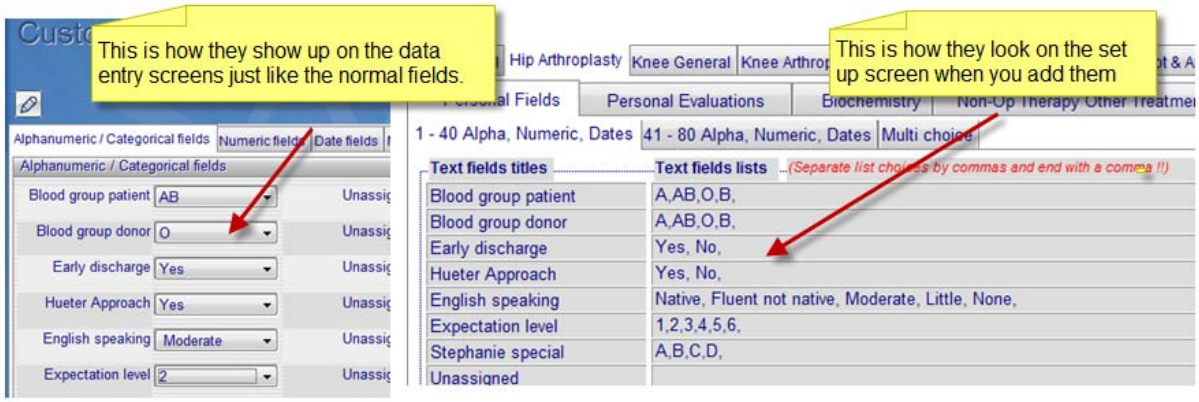
At the bottom of the history screen are two rows of tabs. The bottom are all the scores/surveys that have been selected to display – more about this later.



The top row has the following.

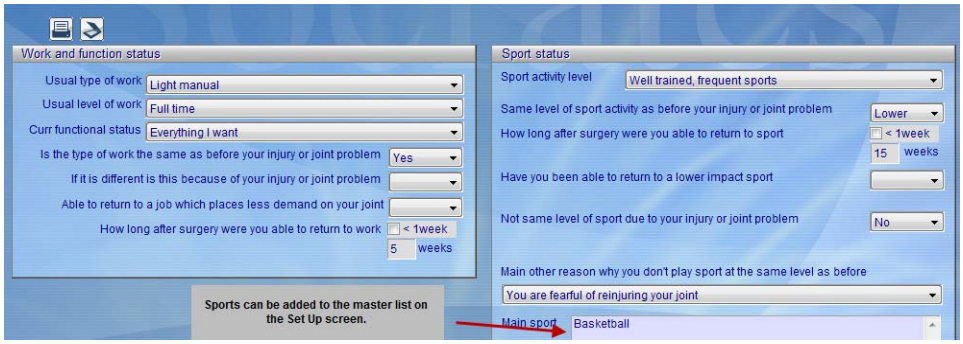
Custom fields

You can create your own Custom Fields and Evaluations (bottom row with the scores) to capture recurring Events. These can be new exclusive lists, multi boxes, numeric values, or dates. See the chapter on Set-Up and Customisation for details on how to add these fields. Once you have added them your new list will show up in these tabs just like the all the fields in the program. Below is an example of some custom fields set up to capture details that are not on the regular screens. It's only limited by your imagination. You can also add and assign them to a specific study group.



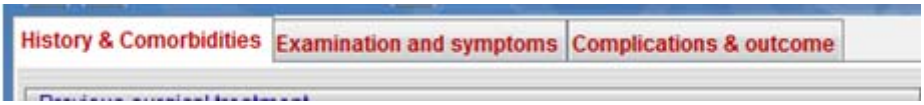
Patient History and Follow-Up Screen

You may not want to collect these data from patient's undergoing arthroplasty as they relate mainly to work and sports function. You can uncheck this and it won't appear if you aren't going to use it.



Surgeon Examination and Follow-Up Screen

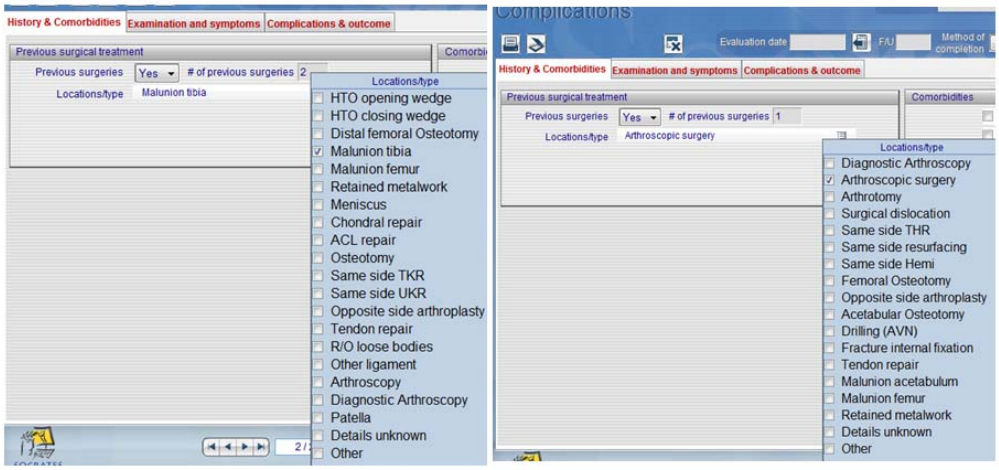
This screen has 3 sections.



History and Comorbidities

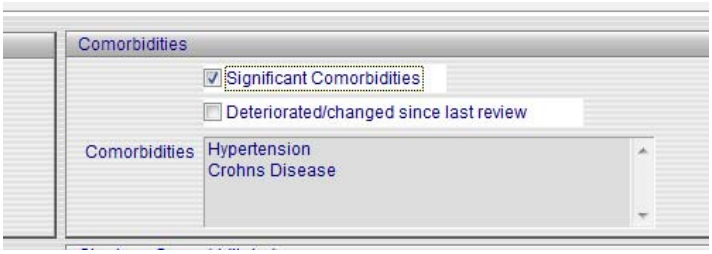
Previous Surgeries

Previous Surgery details can be entered here, this allows you to record if there have been previous surgeries, the number and what they were. If you want more detail, record these in the Notes.



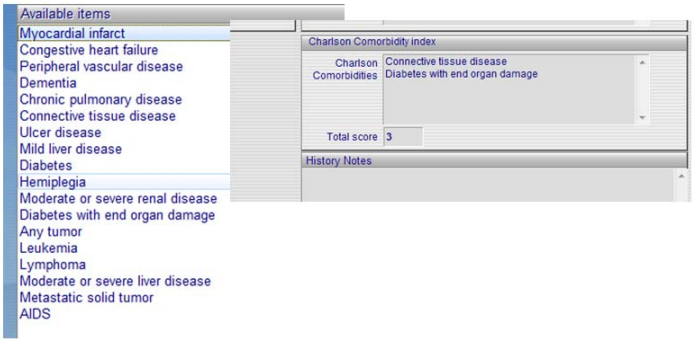
Comorbidities

It's up to you about how much detail you want to collect here but it's obviously a good idea to at least record if the patient had significant comorbidities. It's becoming more important to record this sort of information, patients can now go on-line and score themselves using a number of patient-related outcome scores and compare themselves to others. But all patients are not the same, if you collect some data to demonstrate this it helps to explain results that may differ between patients, and between surgeons. The list can be added to at any time, and more than one can be added to the record, and over time this may change. There is a check box to record this also.



Charlson Comorbidity Index

This is a validated list of comorbidities which, when selected and totalled will give a score which can be used to classify patients according to risk, and subsequent cost to care for.



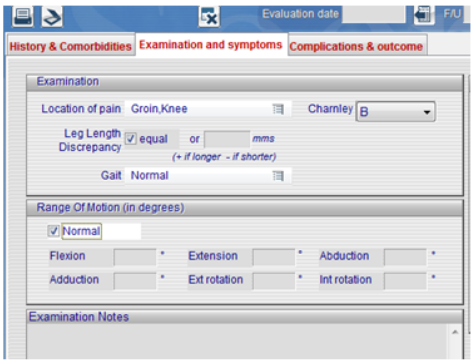
Examination and Symptoms

The, the **Examinations and Symptoms tab** records ROM, Gait and leg length for the hip. Limited details about pain are also recorded here. Pain data will also be captured in more detail on the patient's subjective assessments.

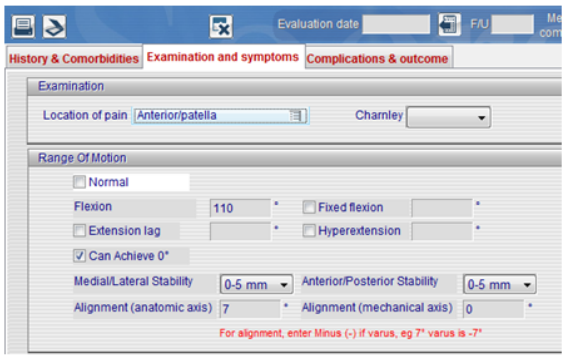
The Charnley classification is also recorded here. If this is recorded at each visit, it will be possible to review and analyse results by Charnley category. This review can be important, since the patient's outcomes scores may deteriorate if additional joints or systemic illness is also involved.

NOTE: If you check 'normal', the fields for ROM are not entered since the consensus was that normal varies for patients as they age and have different activity levels. If you just select 'normal' you can search for all those who you assessed as normal, but if you want to record the specific values you should do so.

Hip Examination

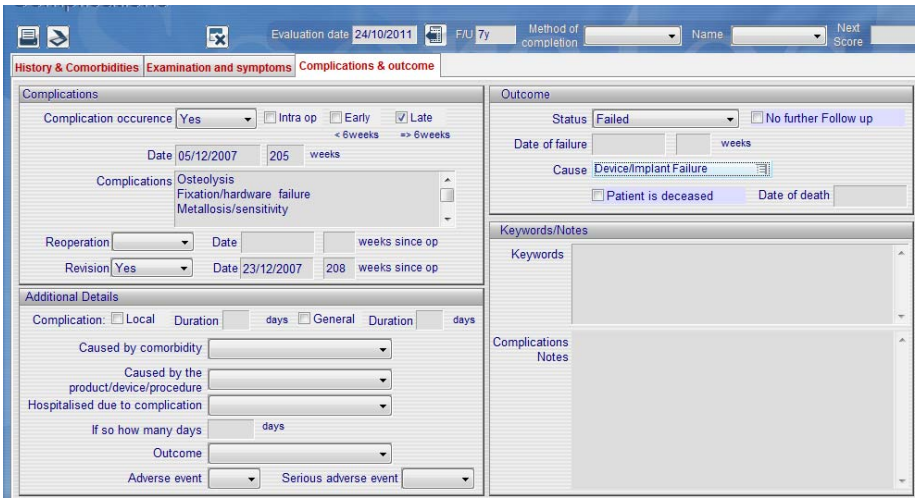


Knee Examination



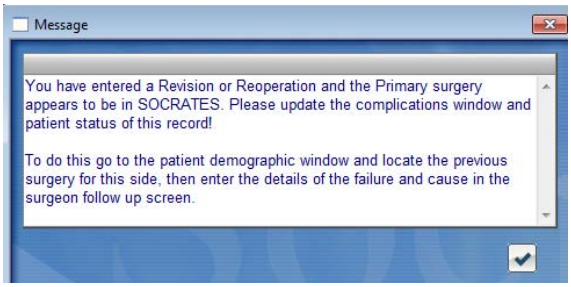
Complications and Outcome Status

The second tab of the **History screen** allows you to record details about any complications, from the very basic, to a lot more detail. You may need to collect more extensive detail if you are involved in a study, or following a new procedure or implant where complications are a key endpoint. In most cases, surgeons find it sufficient to just record a "Yes" in the Complications drop-down menu, click on the **modify icon,** and then double-click into the Complications window to record what it was. You can also collect details of failures, reoperations or revisions here. If you enter the date of the revision or reoperation the weeks since the original surgery will be calculated as well as the time from the operation to the complication.



Patient Status

If the original surgery failed (with or without revision), it's important to record these details on this screen. If the original surgery failed and wasn't revised, we hope you will remember to come to this screen for the original surgery and *change the status,* **and** add some details of *why it failed*. If the program finds a previous entry for the same side when a revision is entered you will see this message reminding you to update the status and complications related to the previous surgery.

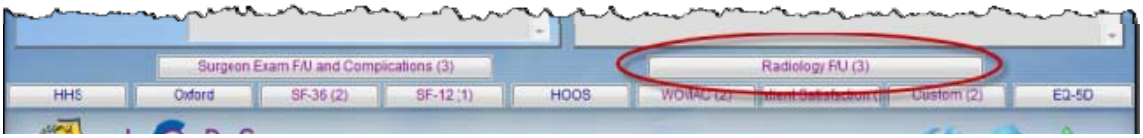


Complication Details

Complications are important; *especially if they result in a revision*. Don't be put off by the amount of detail on this screen. In most cases it's enough to just select Yes, and name the complication. But in line with our "one size fits all" program, you can record more detail if you need to. If you are doing a trial on a new implant, for example, the implant company may require these extra details.

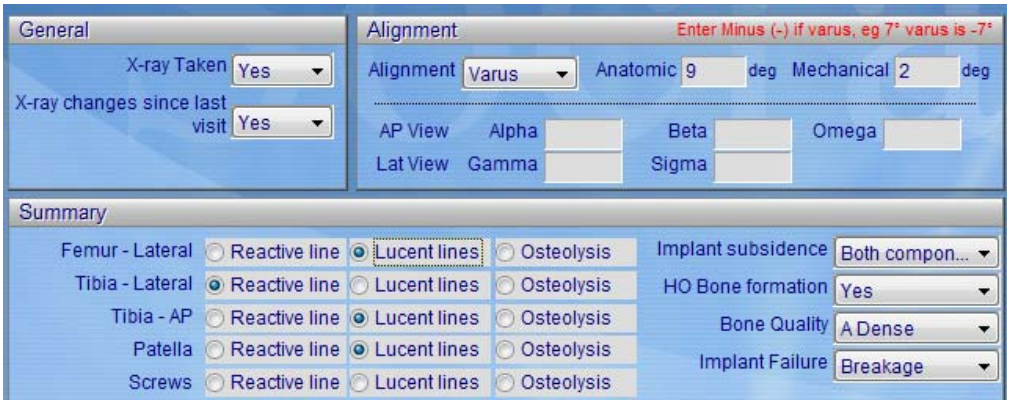
Radiology Assessment and Follow-Up Screen

This screen is accessed by clicking on the **Radiology and Follow-Up tab** at the bottom right of the **History screen.** It allows you to record radiological findings from X-ray and other radiological tests.

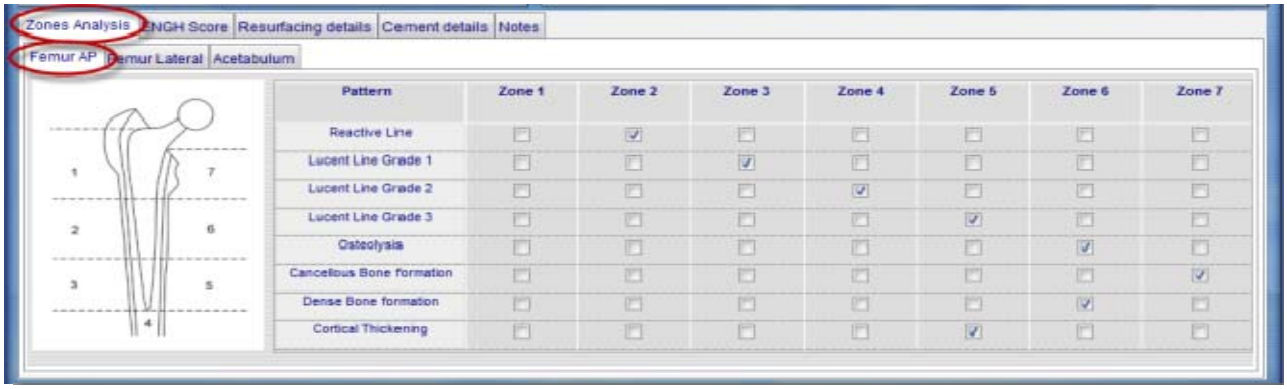


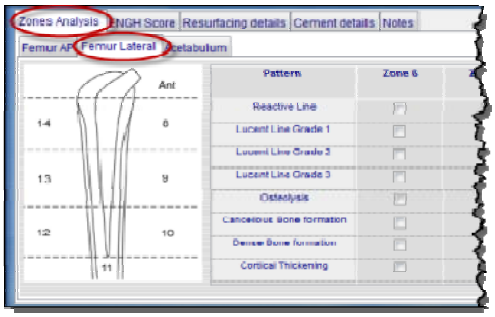
This screen records the presence and progression of osteolysis and position of implants. Additional details include heterotopic bone formation, grade, bone quality, implant position, and details of subsidence. The top section, (which you see below), allows you to merely record whether there is lysis *present*, without going into detail about what was seen in each zone; this is a "lite" version. There is also a field to record any changes since the last visit, which is handy for searching. You can easily recall all the surgeries where this was Yes.

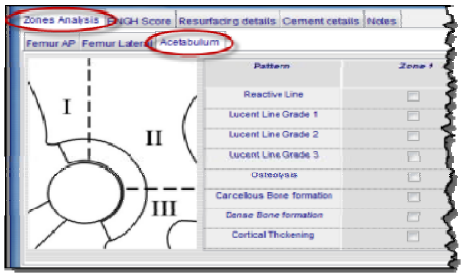
Hip Zones



There is an option to record details of progression of lysis *by zone* for AP lateral and acetabulum, as below.

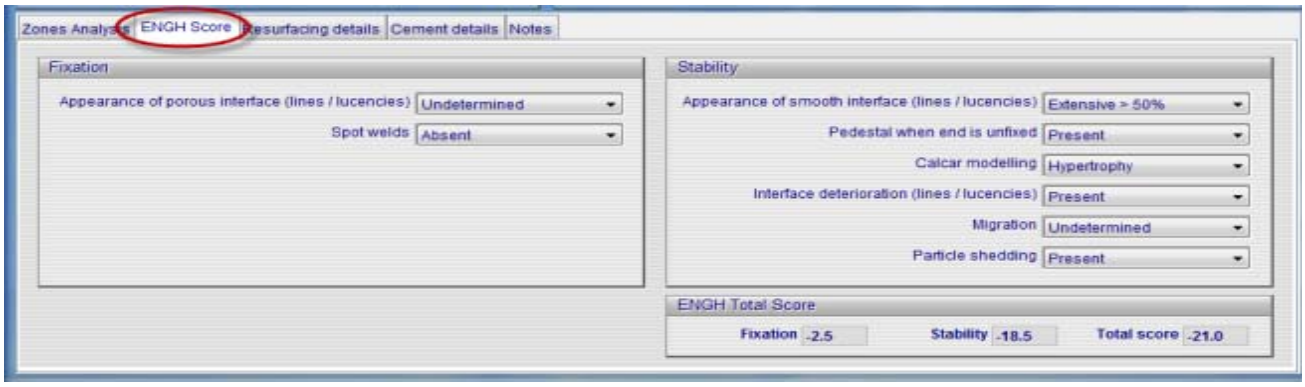






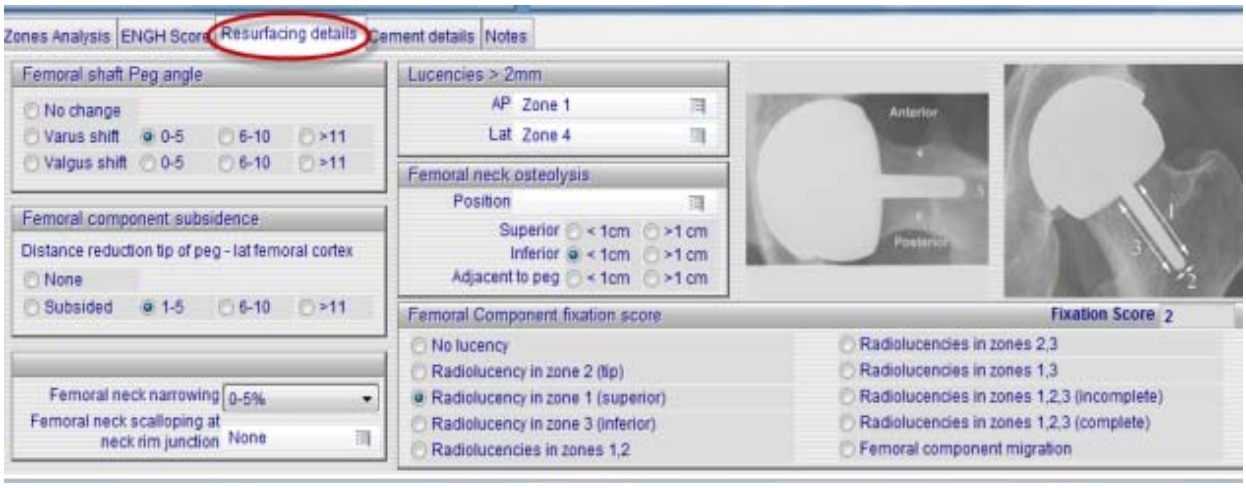
Engh Score

The second tab on the **Hip Radiology Screen** records parameters, and an **Engh score** is calculated for Uncemented Femoral components.



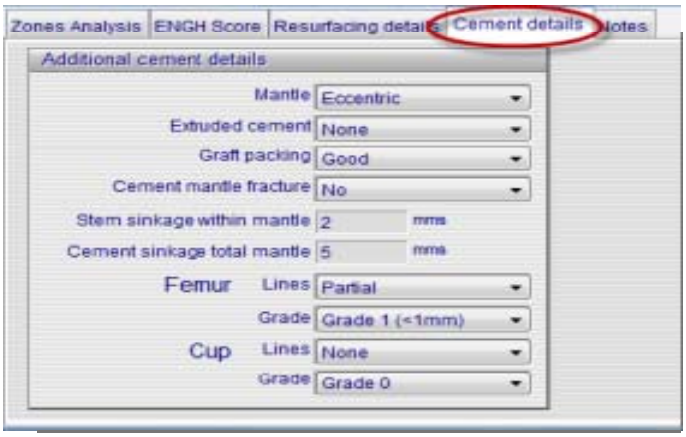
Resurfacing Replacements

The third tab records additional details specific to Resurfacing procedures. The screen calculates a femoral fixation score.



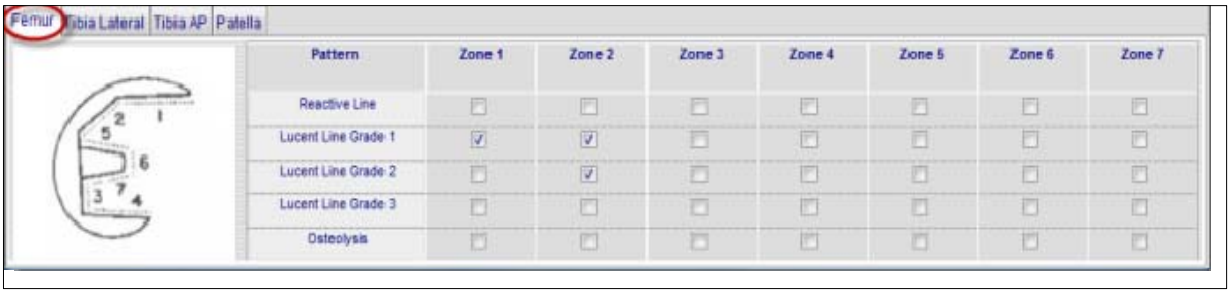
Cemented Implants

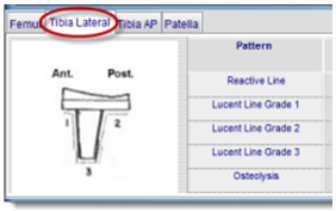
The fourth tab records additional details specific to Cemented procedures.

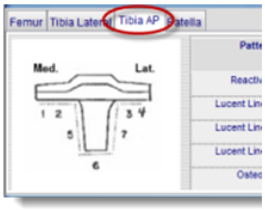


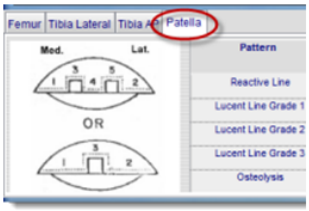
Knee Radiology Screen

There is an option to record details of progression of lysis by zone for femur, AP & lateral tibia, and patella, as below.









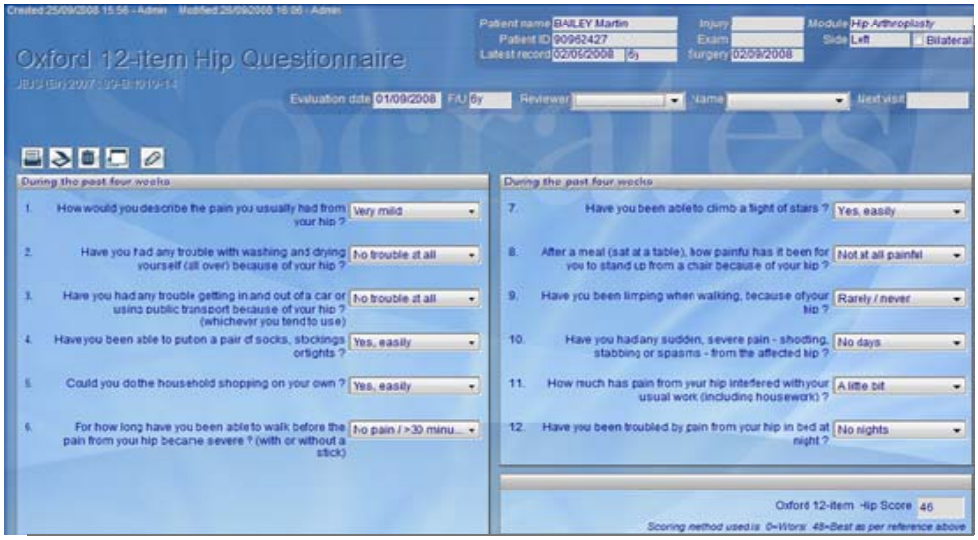
Scores and Evaluations

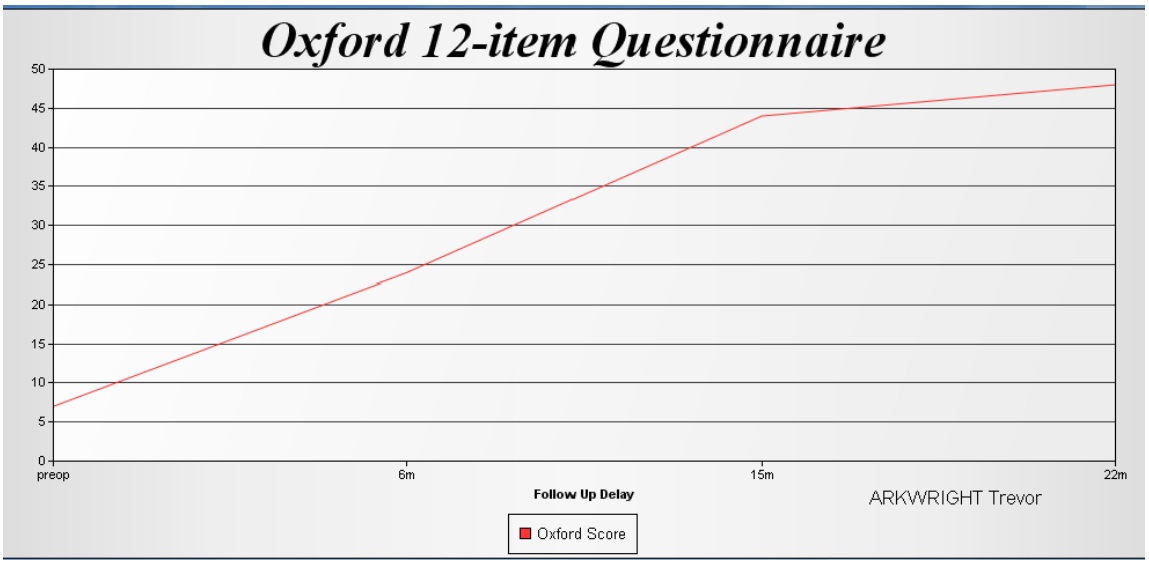
The scores and evaluations for these two modules are displayed along the bottom of the **History screens**. See the Data Entry chapter for how to enter scores. To display only the scores you actually use, go to the **Set-Up screen** and select the ones you want and only those you choose will be visible on the screen.

Hip

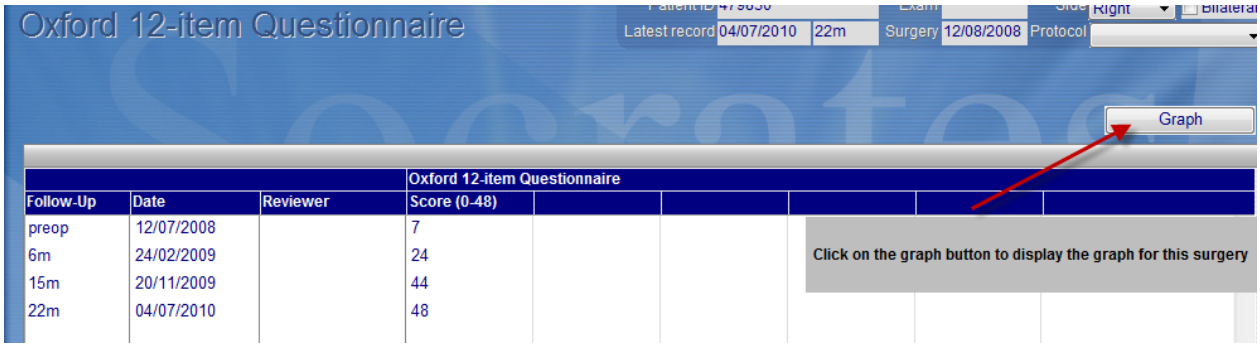
Knee

An example of a score screen - the Oxford Hip score. Note that if you are using this you should contact the ISIS corporation to obtain a licence. Contact this address for more details healthoutcomes@isis.ox.ac.uk



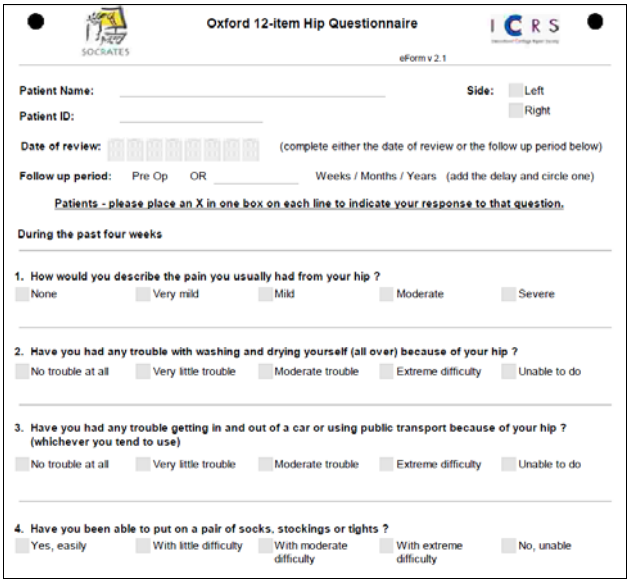


Scores results can be displayed by clicking on the **Results icon**, and then a graph viewed, printed or exported for the individual result.



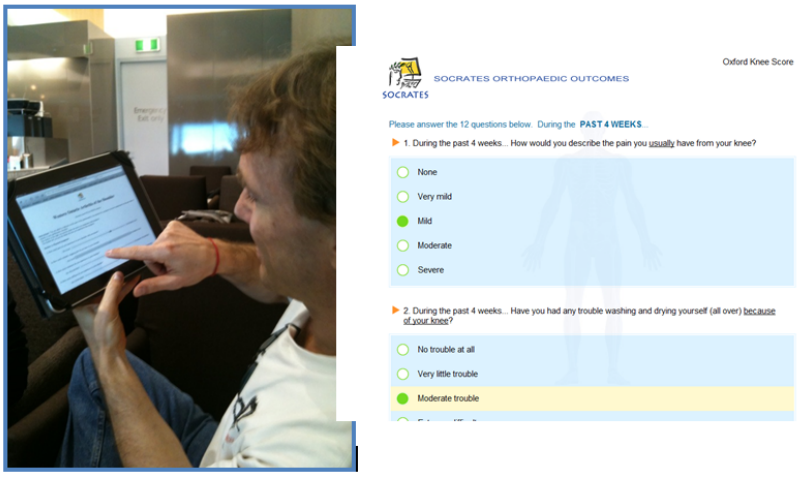
Satisfaction questionnaire is also included. It's a good idea to use this, as sometimes the patient may not have the greatest score, but may be very happy with the surgery. Events can occur the other way around of course, but either way it's good to know. This score also includes a question about how "normal" the patient's joint feels. The 3 VAS 0-100 questions can be used at a preop time point, the post op time point includes the additional 5 asking the patient how satisfied they were with the surgery.

The scores can be entered manually, and most can also be scanned in using a standard office scanner, the answers will directly populate the screens in Socrates. Below is an example of the scannable Oxford form.



Web based data entry

The majority of the patient scores can be entered via the web directly by patients via email, or on line in the clinic (English only).



SURGERY SCREENS

From the Hip or Knee Arthroplasty History Screens, click on the **Surgery icon** to access the fields that record all the relevant details about the surgery itself.

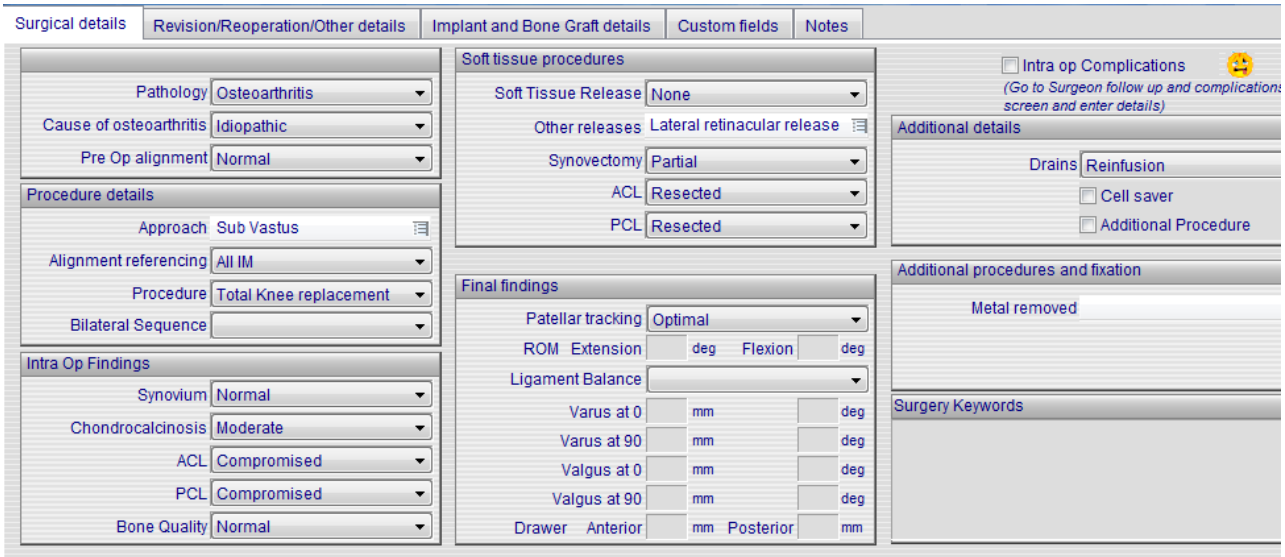
Common Details

Details of the anaesthetic, surgery time, tourniquet etc. are recorded at the top of the **Surgery screens**.

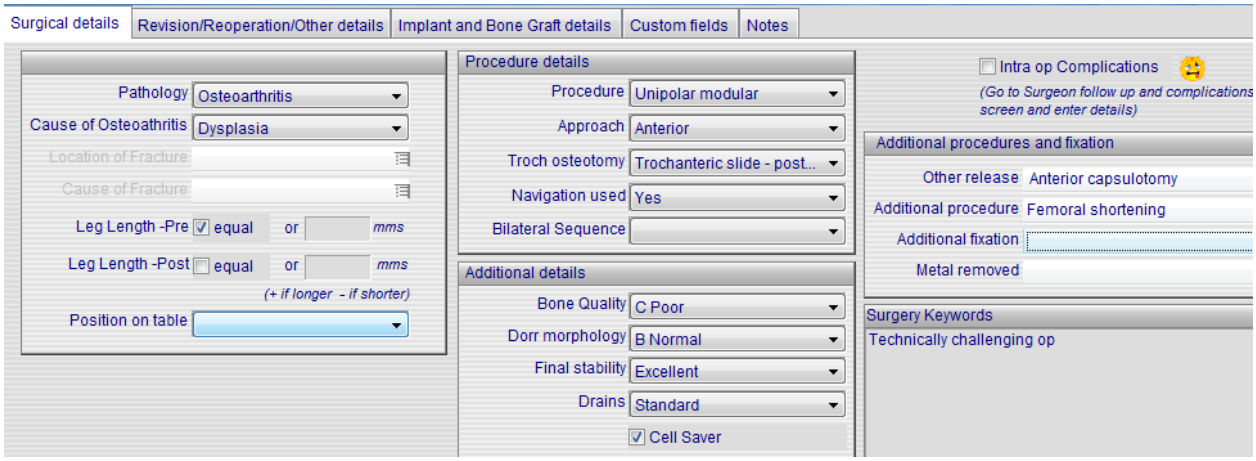
The surgical screens for both the Hip Arthroplasty and the Knee Arthroplasty modules are divided into **Surgery** details, **Revision** details, and **Implants**. Arthroplasty Surgical Details

- Pathology and alignment
- Approach
- Intra operative findings
- Bone quality
- Additional procedure
- Final status
- Keywords
- Intra operative complications

Knee

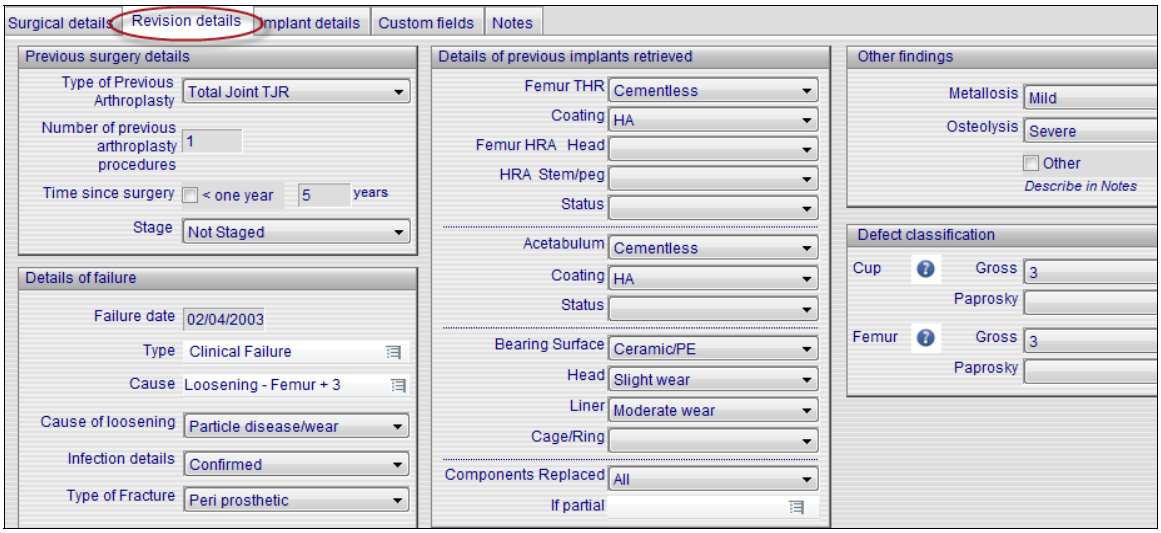


Hip



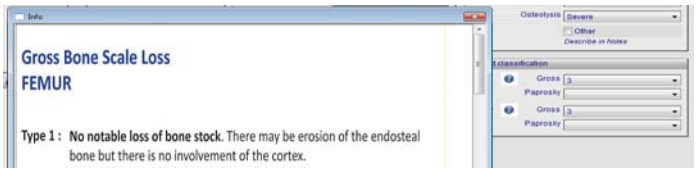
Arthroplasty Revision Details

These screens record details of the previous surgery, including the number of previous surgeries, time since last surgery, and failure date. Details of the *reason* for failure are recorded, which can be used for survivorship analysis.



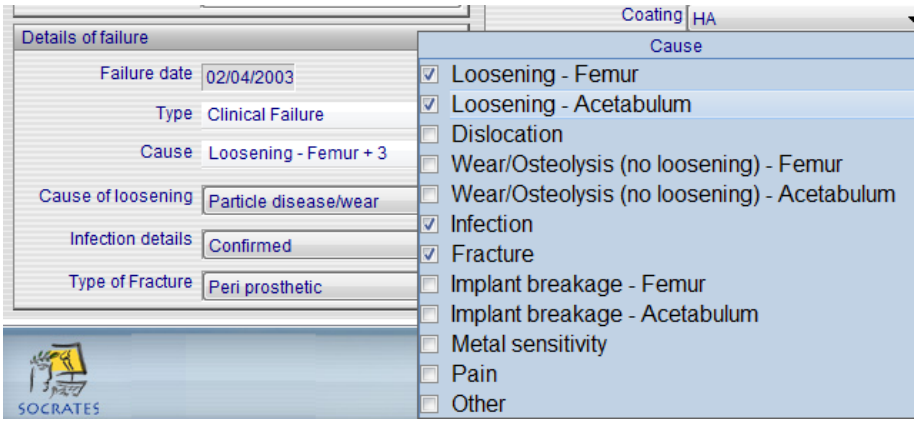
Bone Loss Classifications

Included are Gross and Paprosky for the hip. See section on scores and classifications for more details.



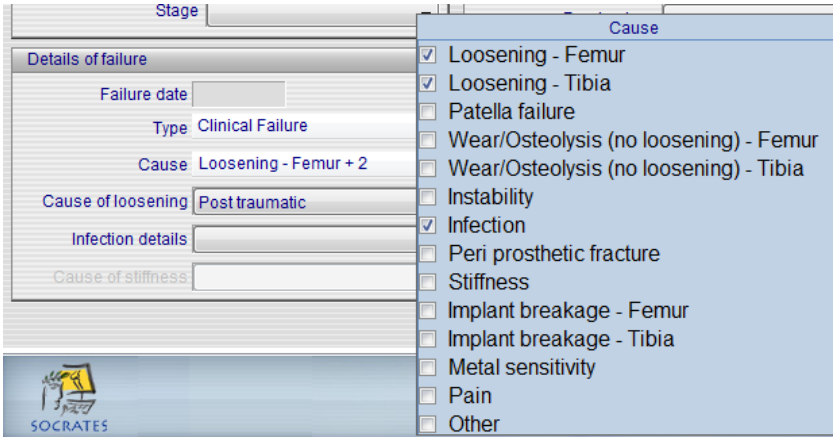
Causes of Failure

More than one cause of failure can be selected. Sub-menus appear for loosening, infection, and type of fracture.



Cause of Failure – Knee

Sub-menus appear for loosening, infection and stiffness.

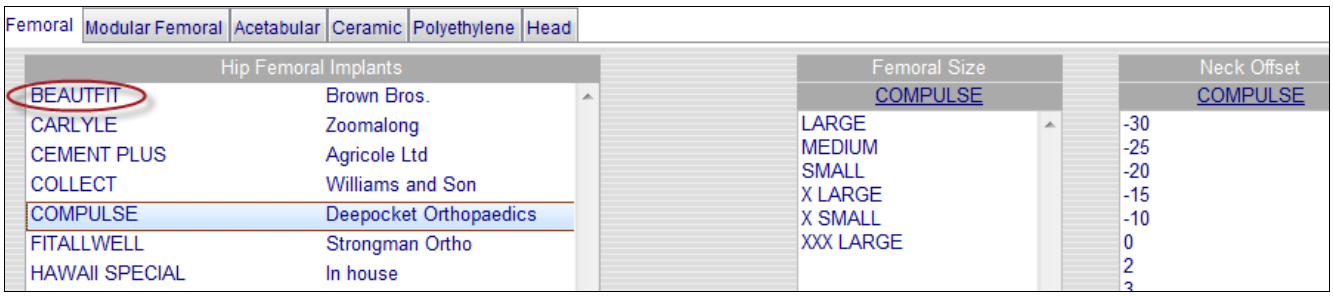


Implant Details

All implants used must be first entered in the **Set-Up screen**. The implant brand is entered, followed by the sizes associated with each implant. We also include the brand of the *head,* since heads are not always the same as the femoral component, and this could affect the outcome.

These details need to be set up by the surgeon, or someone who understands how all the implants are put together. It's a bit like orthopaedic Lego, and difficult to do if you don't have significant clinical knowledge. It's a little tedious, but if you put aside an hour or so when you are starting off, and try to input all the common implants you use at once, it will save you having to go back to this window unless you want to add a new implant.

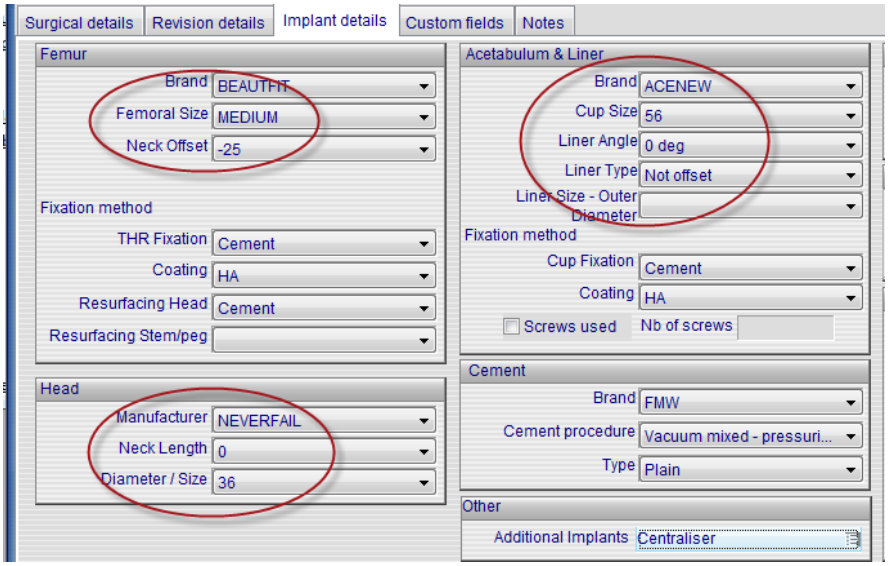
There is also the option to add Favourite sizes: you can save the list of commonly used sizes and use them again. For example, you might want to set up a Favourite list of head sizes, which are pretty much the same, regardless of brand. Enter them once, save as a Favourite, and you can later select this list for every new head that you add. See the Set-Up chapter for more details.



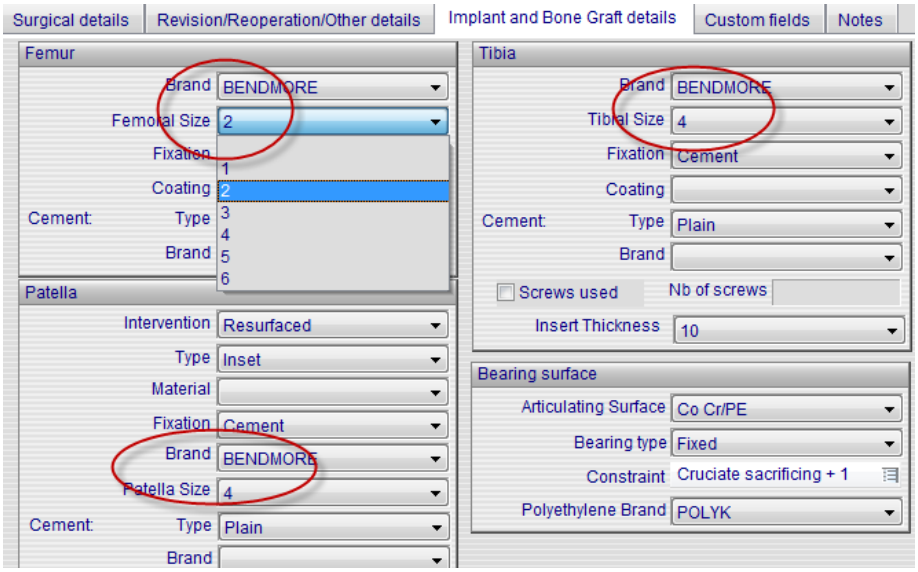
Once they are set up, all implants and associated sizes are displayed as drop-down boxes on the **Implant screens**.

Arthroplasty Implants Screen

HIP

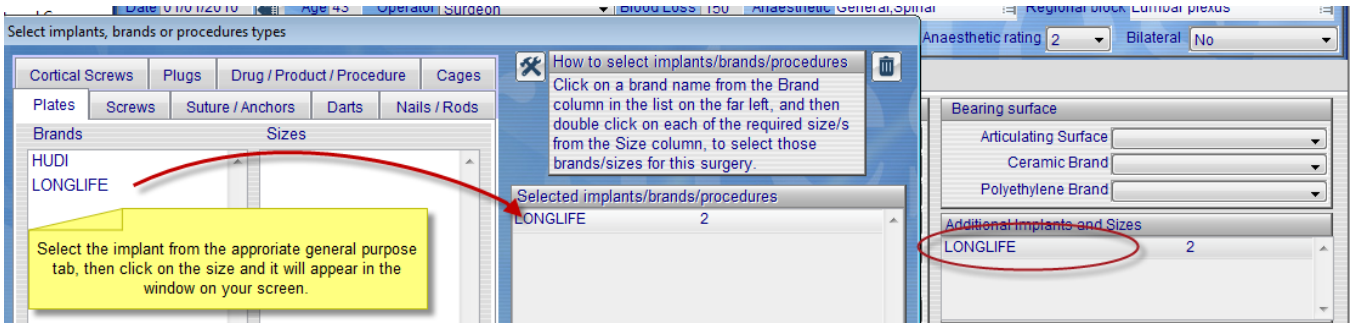


KNEE

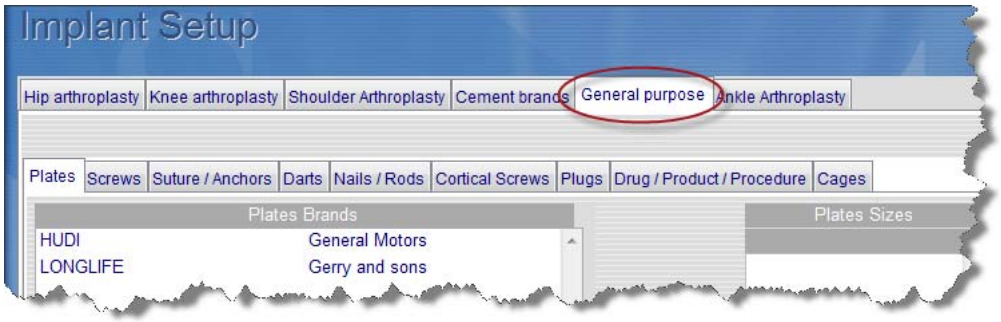


Other Implants

In some cases other implants such as plates, screws, cement plugs etc are used. These can be entered by clicking on the additional implants window.

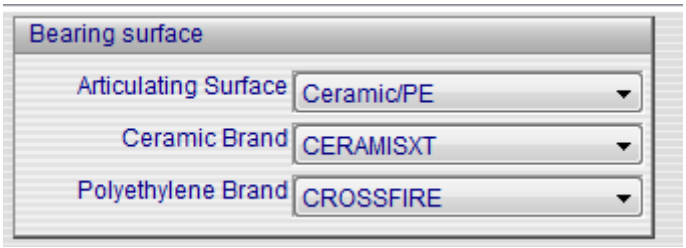


The implants are added to the master list in the Set Up screen 'Implants' and they are found on the general tab.



Bearing Surfaces

This screen also records the type and brand of bearing surface and polyethylene.

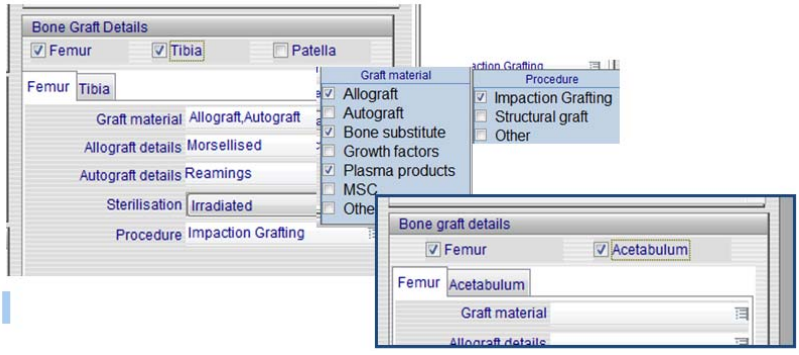


Bone Graft Details

Details of bone grafts are also included on this screen. Details of the type of graft, region grafted, sterilisation, etc. are recorded.

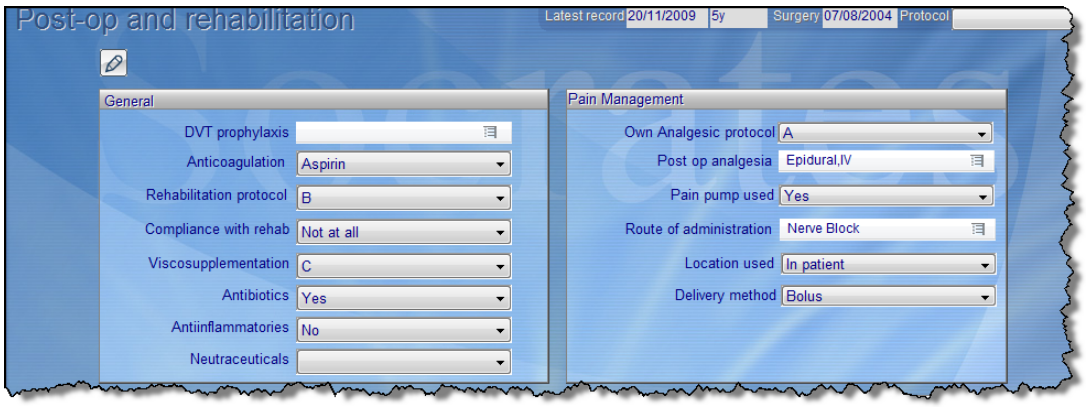
Hip Bone Graft Details

Details can be recorded for both the femur and acetabulum in the hip, the femur, tibia and patella on the knee. The patella is just selected as being grafted; no details are recorded.



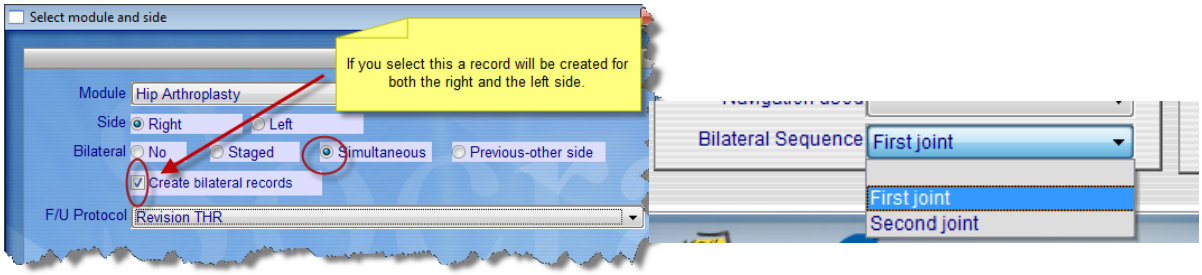
Post-Op and Rehab Screen

This screen is common to all the modules. It is accessed by clicking on the **Rehab icon** at the top right of the **History screen.** See the chapter on Adding a Surgery for details on how to add data to the **Post-Op and Rehab screen.**

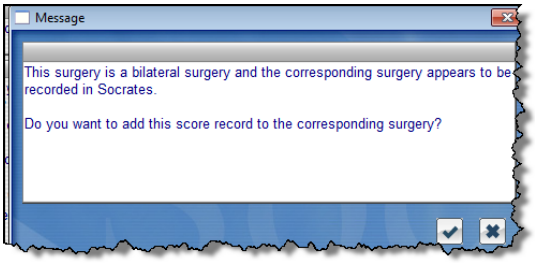


Bilateral Arthroplasty Surgeries

An increasing number of joint replacements are being done on both sides, either staged or simultaneously, or at a later date, and it is important to be able to search for these. Socrates allows you to record this either at the time you created the record/s, or at a later stage (if the other side was done later). Two records will be created if you select either Staged or Simultaneous, one for each side. You can also record on the surgery screen the sequence of the bilateral joint, was this the first or the second joint done?

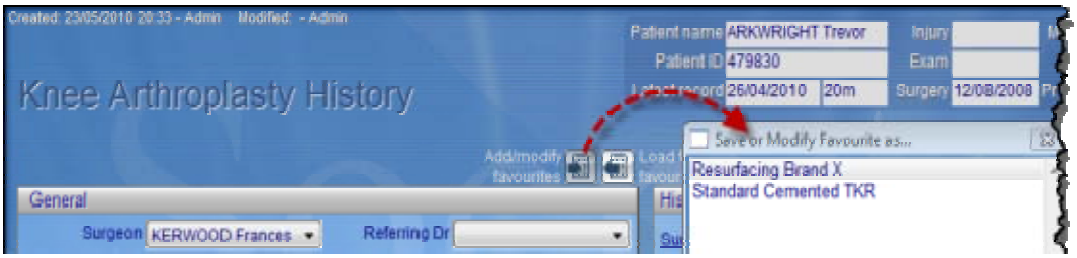


You can also assign some of the scores that aren't joint-specific, (VA12 and 36, EQ5D Patient Satisfaction), to the other side if you've indicated that the surgery is bilateral. The program detects this, and you will see the following message. Select Yes, and the score will be entered into the record for the other side.



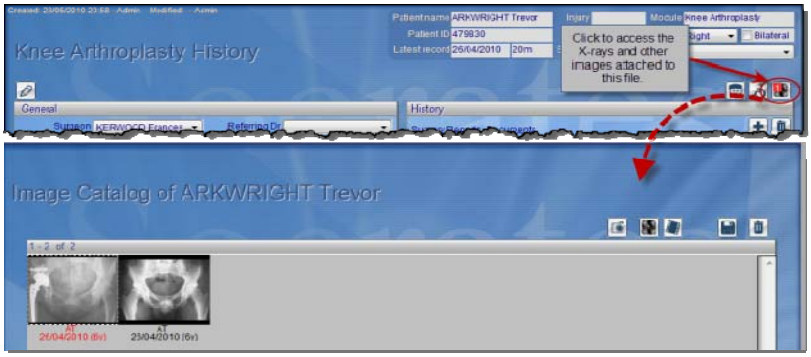
FAVOURITES

This is an important feature, it will save a lot of time especially if you are entering the data yourself in the OR. It is possible to set up favourites using default fields for routine procedures, for example Cemented Hip, Standard Resurfacing, Dr Bloggs, THR, Uni-Knee, etc. See the chapter on Data Entry (Favourites) for more details. This makes data entry much quicker, since fields such as Approach and Brand of Component (which might be used routinely for these procedures) will *automatically populate* when you click on the Favourite. Data entry for a procedure in real time will take less than a minute. (We hope you've managed to have the program installed on the network so you can access it from the OR!)



IMAGES (XRAYS, VIDEOS, CT SCANS, MRIs, ETC.)

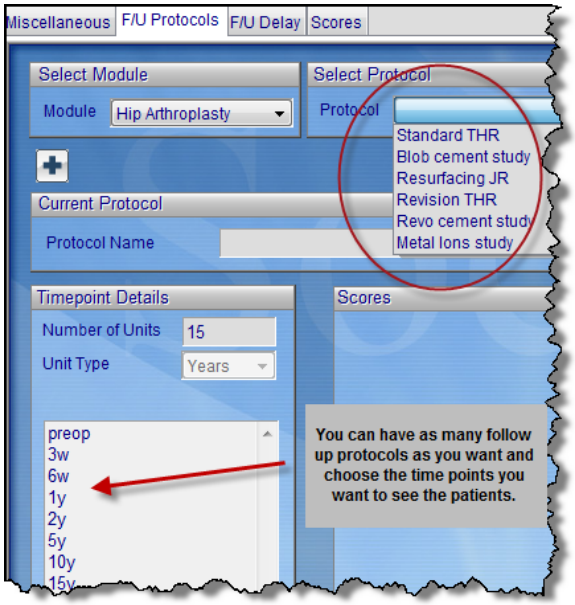
Images can be stored, searched for, printed, and exported from the **Hip** and **Knee Arthroplasty Surgery screens**, by clicking on the **X-ray icon** on the right of the screens. See the chapter on **Images** for more details, including how to give the images **Keywords** for easy searching and selection at a later date.

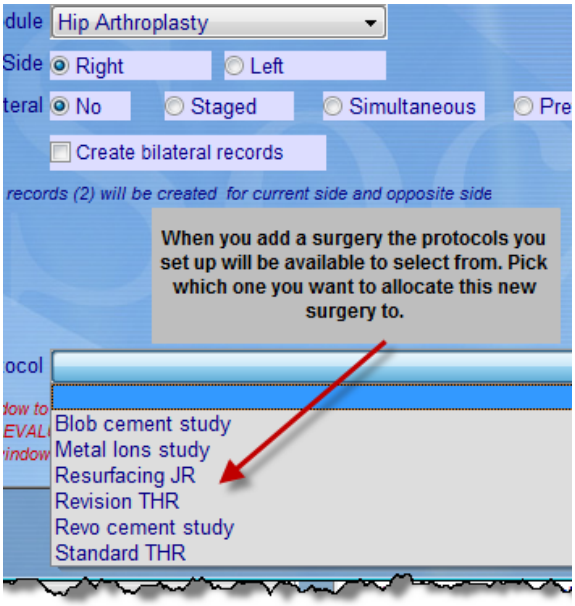


FOLLOW-UP PROTOCOLS

Don't lose your patients (unless you want to!). You can choose a **Follow-Up Protocol** so the program knows when the patients are due back for their next follow-up, and can remind you. The different options in the drop-down menus are created by you in the **Set-Up screen** (**tools icon**). It's a good idea to make sure that each surgery you do belongs to one of the protocols you set up. This practice makes it easy to generate statistics and to search for patients and surgery outcomes, as well as to follow them up at the required time points. For example, if you set up a protocol for Standard THR's, Revision THR, etc., it is quick and easy to pull out data on the pre-op and post-op scores for all surgeries in these groups.

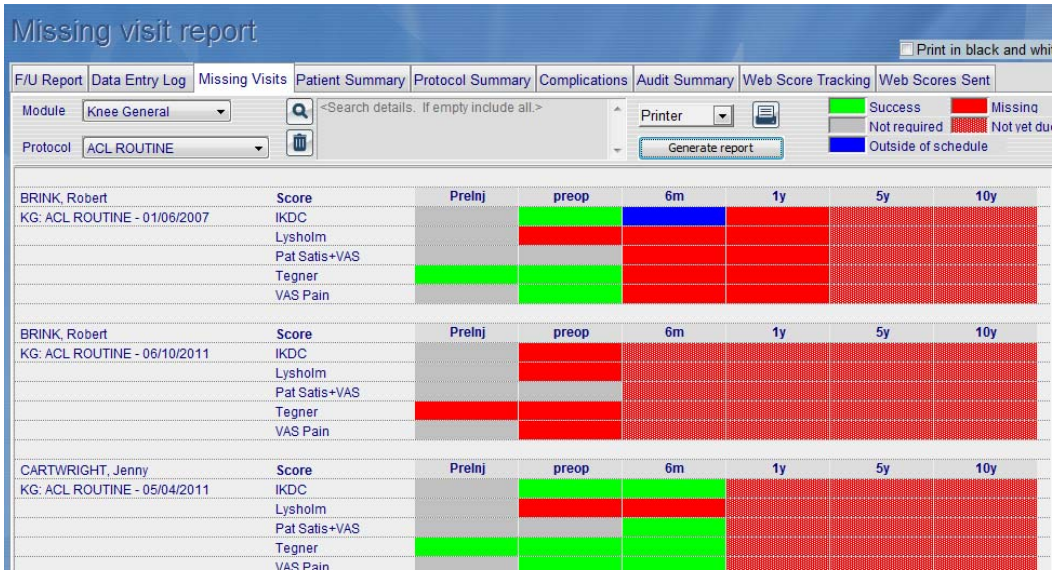
These are also essential for the web scores as this is how the program knows what scores to send out at what time points.





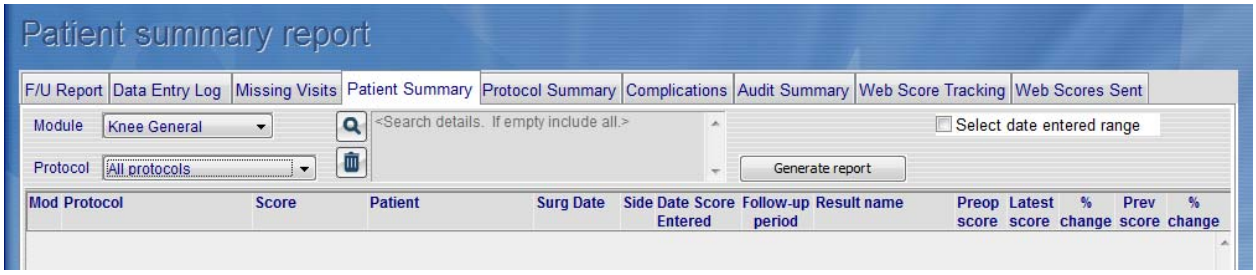
REPORTS

There are several reports built into the program which make it easy to track your patients' progress, when they are due back, who has missed their time points, which have deteriorated since their last visit, and how the group are doing overall. Most of these require a protocol so the data can be grouped so it's really a good idea to spend some time setting these up.



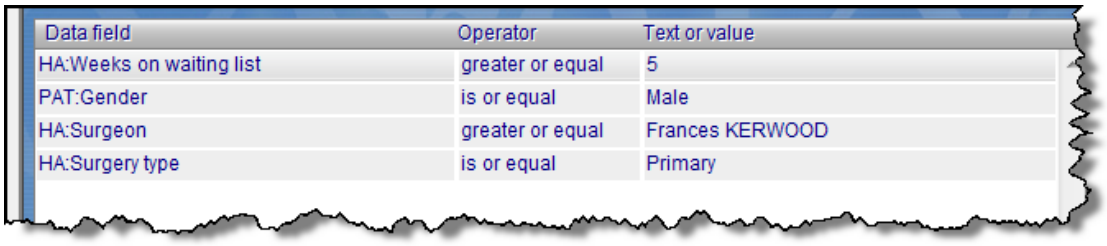
There is also a complications summary and an audit report which displays the number of procedures done by surgeon, broken down into primaries revision, reoperations etc.

There are also reports here to help to track the web based scores and alert you to any that may be deteriorating.



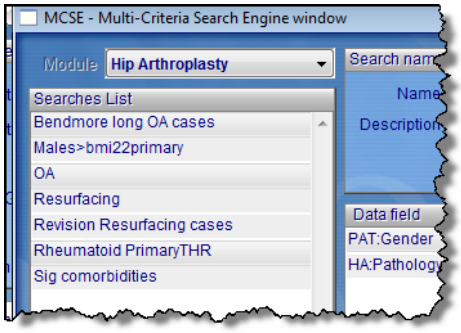
SEARCH

A specialised search function in Socrates' **Surgery screens** allows you to search for any field or combination of fields in the program. The example below shows a search that also uses one of the custom fields, weeks on the waiting list. See the chapter on Searching for how to set up your own searches. The can be saved and also grouped so a group of searches that might be run regularly can be saved and run as a group which saves time.



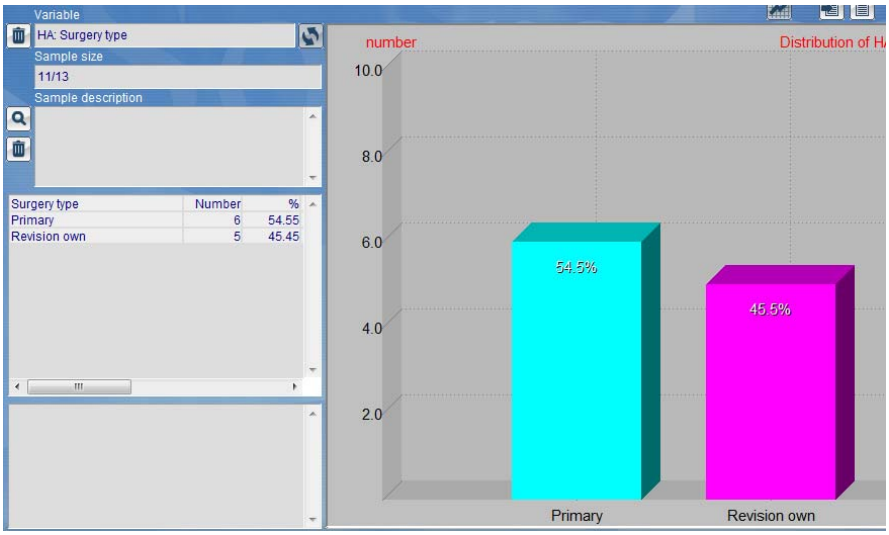
Data field	Operator	Text or value
HA:Weeks on waiting list	greater or equal	5
PAT:Gender	is or equal	Male
HA:Surgeon	greater or equal	Frances KERWOOD
HA:Surgery type	is or equal	Primary

Here are some saved searches.

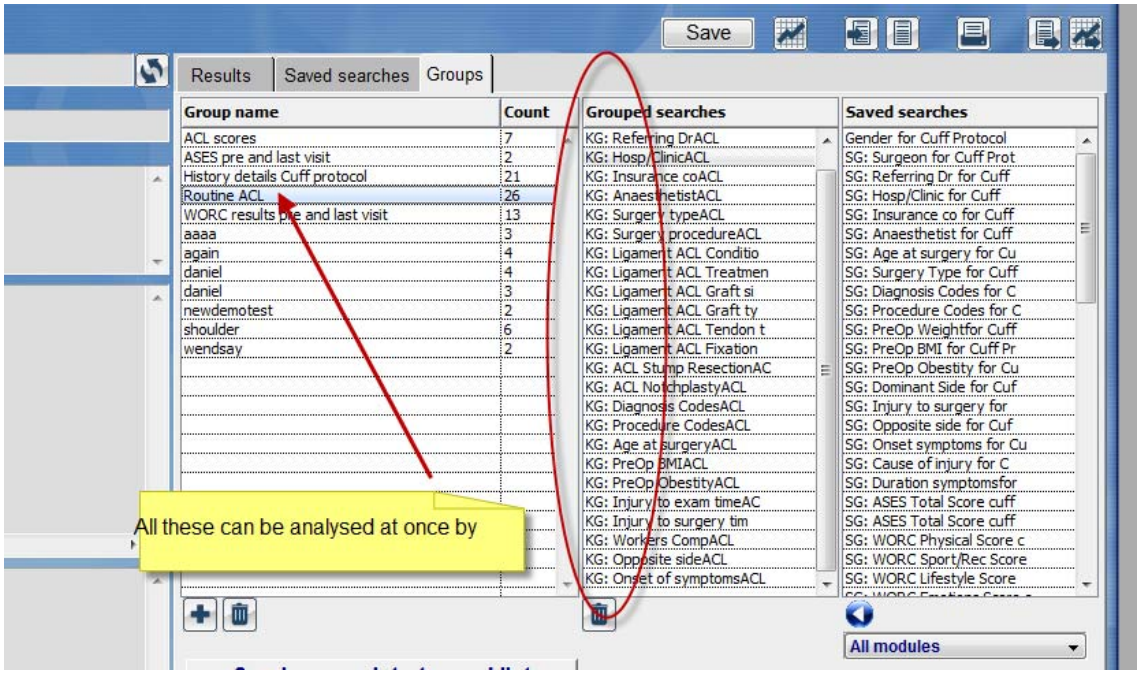


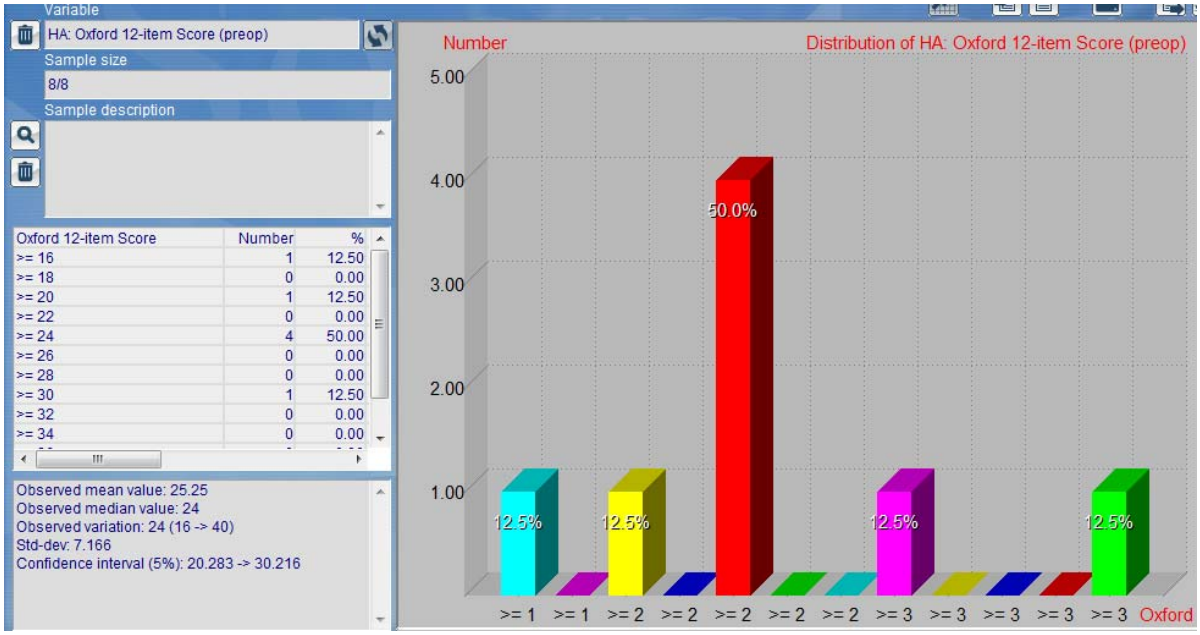
STATISTICS

Socrates provides you with basic descriptive statistics for you to calculate your own basic statistics without the help of a statistician. However, if you do find you want to do more sophisticated statistical analysis, all of the fields in Socrates can be exported to Excel for transfer to a dedicated stats package. See the chapter on Statistics for more information.



You can also save your regular statistical searches into a group so they can all be run at once. This saves a lot of time if you are doing regular reviews on your basic data.

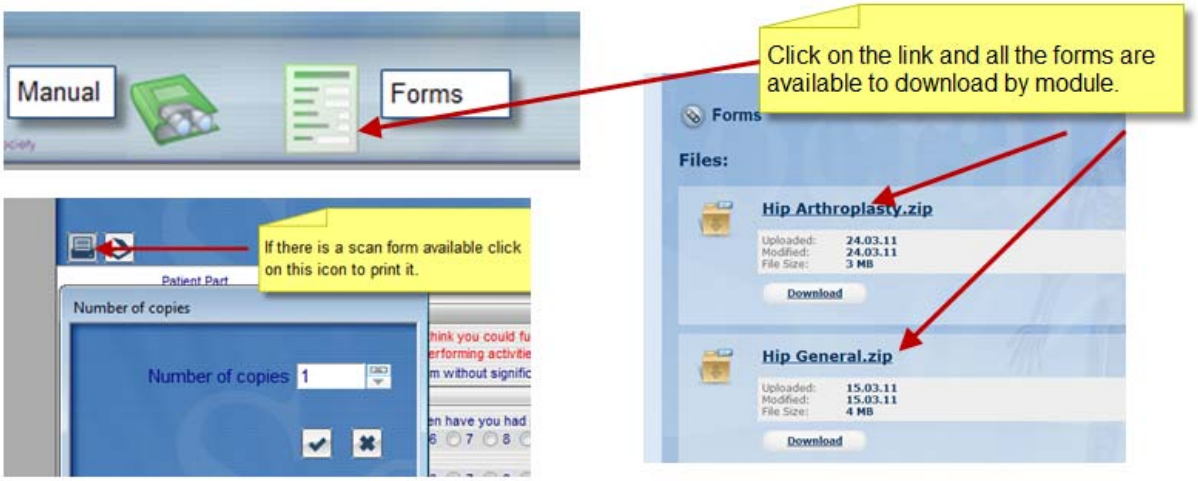




By the time you have read this you wil have an understanding of the main features of the arthroplasty modules. If you are the person setting up your database you will now need to go to the Set Up chapter and start getting your database ready for your own use.

FORMS

All the screens in Socrates have forms to match. There are also scannable forms inside the all the forms folders in their individual modules folders but these can be printed out from each screen where you see a print icon. There are also scannable forms for the surgical details. On the home page there is also a link to the Socrates web site which will access the up to date forms.



List of Forms

LEGEND
Y: these forms are available in the format of the column heading.
ALG missing: Y indicates that an algorithm is built in to the score so that if some questions are missing, a score is still possible. See chapter on scores for individual scores information.
Scan forms: forms available as a scannable PDF to capture data via a Scanner
Type: QS = patient questionnaire; SU = surgeon form; SC = Score
Patient/Surg: P indicates the patient completes the form; S is a surgeon completed form; C is combined

HIP ARTHROPLASTY	HA	WORD FORM	WEB SCORE	SCAN FORM	ALG MISSG	Type	Patient /Surg
GROC Global Rating of Change		Y		Y		QS	P
Patient Satisfaction, Normal, and Pain VAS Preop	S8	Y	Y	Y		QS	P
Patient Satisfaction, Normal, and Pain VAS Postop	S8	Y	Y	Y		QS	P
SOMOS - US Military Patient History	NEW	Y	Y	Y		QS	P
Euroqol EQ5D		Y	Y	Y		SC	P
Harris Hip Score	S13	Y	Y	Y		SC	C
HOOS - Hip Dysfunction and Osteoarthritis Outcome Score	S3	Y	Y	Y	Y	SC	P
Oxford Hip Score	S4	Y	Y	Y	Y	SC	P
Reduced WOMAC	S11	Y	Y			SC	P
UCLA Activity		Y	Y			SC	P
VAS Pain Score		Y	Y	Y		SC	P
Veteran Rand-12 General Health Survey	NEW	Y	Y	Y		SC	P
Veteran Rand-36 General Health Survey	NEW	Y	Y	Y		SC	P

HIP ARTHROPLASTY	HA	WORD FORM	WEB SCORE	SCAN FORM	ALG MISSG	Type	Patient /Surg
WOMAC Hip Index	S10	Y	Y	Y		SC	P
Complications		Y		Y		SU	S
Hip PostOp Examination	HA1	Y				SU	S
Preop Examination	HA1	Y				SU	S
Radiology Cemented	HA4	Y				SU	S
Radiology Resurfacing	HA6	Y				SU	S
Radiology Uncemented	HA5	Y				SU	S
Rehab and PostOp	S9	Y				SU	S
Surgery Revision Details	HA3	Y		Y		SU	S
Surgical Details Primary	HA2	Y		Y		SU	S
Patient Demographics and Surgery Details	NEW	Y				SU	S

KNEE ARTHROPLASTY	KA	WORD FORM	WEB SCORE	SCAN FORM	ALG MISSG	Type	Patient/ Surg
GROC Global Rating of Change		Y		Y		QS	P
Patient Satisfaction, Normal, and Pain VAS Preop	S8	Y	Y	Y		QS	P
Patient Satisfaction, Normal, and Pain VAS Postop	S8	Y	Y	Y		QS	P
SOMOS - US Military Patient History	NEW	Y	Y	Y		QS	P
Euroqol EQ5D		Y	Y	Y		SC	P
Knee Society Score (KSS)	s14	Y	Y	Y		SC	P
KOOS - Knee Injury and Osteoarthritis Outcome Score	S15	Y	Y	Y	Y	SC	P
Kujala		Y	Y	Y		SC	P
Oxford Knee Score	S16	Y	Y	Y	Y	SC	P
UCLA Activity		Y	Y			SC	P
VAS Pain			Y	Y		SC	P
Veteran Rand-12 General Health Survey	NEW	Y	Y	Y		SC	P
Veteran Rand-36 General Health Survey	NEW	Y	Y	Y		SC	P
WOMAC Knee	S10	Y	Y	Y		SC	P
Complications		Y		Y		SU	S
PostOp Examination	KA1	Y				SU	S
Preop Examination	KA1	Y				SU	S
Radiology Follow Up	KA4	Y				SU	S
Reduced WOMAC	S11	Y	Y			SU	P
Rehab and PostOp	S9	Y				SU	S
Surgeon follow up and comps	KA5	Y				SU	S
Surgery Details Primary	KA2	Y		Y		SU	S
Surgery Revision Details	KA3	Y		Y		SU	S
Patient Demographics and Surgery Details	NEW	Y				SU	S

INDEX