

SOPHIEs made easy: Part 7



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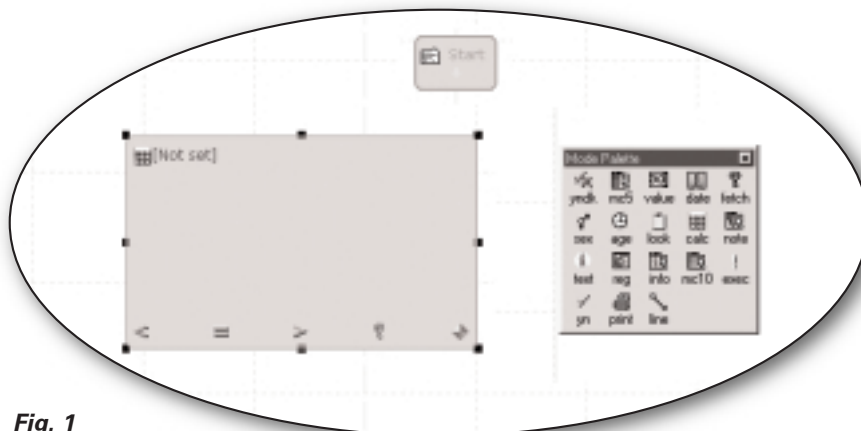


Fig. 1

Conference has come and gone, and judging by the feedback from the SOPHIE sessions run by Richard Gunn it would seem that we might have a new band of converts on board. So if this is your first tentative dip into the muddy waters of this series you can do no better than get hold of a few back numbers of *Torus* and start right back at Part 1. You might be able to skim the first few sections but reading from the beginning will make the whole thing a lot clearer.

For those readers who are now old hands at the wonders of SOPHIE it's time to tackle \$CALC, the question which aims to make mincemeat of the tricky formulae that the computer can perform so much better than can a busy clinician!

\$CALC

This is a cross between a database question and one which requires user input. It doesn't itself ask for user input, but utilises data which has either to be taken from the database, or entered earlier in the SOPHIE.

Open the Graphical SOPHIE editor, click on the 'Calc' icon on the palette, then drag the object open in the usual way (Fig. 1).

At the top left there's an icon that looks a bit like a handheld calculator with the words [Not Set] next to it, so double-click on that and Fig. 2 is what we get.

The view shows two tabs, called *Show User* and *Calculation*. It will come as no surprise to hear that *Show User* is what the user sees on screen when the question is running. The default words are 'Not Set' so change this to read something informative, such as 'Calculating BMI', which is what we are going to do for this example.

Now click on the 'Calculation' tab and you will see four fields appear that don't seem quite so intuitive (Fig. 3).

At this point it might be a good idea to review your knowledge of 'assigned variables' which we've covered at various points in this series, especially Part 6. This is where we take a value, for instance the patient's weight in kilos, and 'assign' it to a letter of the alphabet. By general consensus we use the following letters for these variables:

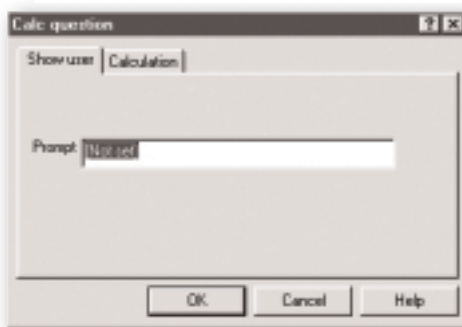


Fig. 2

- A Age
- D Diastolic BP
- H Height
- S Systolic BP
- W Weight

The field labelled *Assign to Variable* is expecting us to assign another letter of the alphabet to the end result of our calculation—in this case the BMI. There's no hard and fast rule about which letter to choose in this case. Let's use the letter B: so pull down the menu in this field using the right hand side drop-down arrow, and click on the letter B.

The field labelled *Expression* is the crucial formula to determine the BMI. If you get this bit wrong then the whole question will be rendered invalid! Expressions can use all the usual mathematical signs including - for subtraction, + for addition, * for multiplication, / for division, () for brackets, and ^ for exponentiation.

For our BMI example I'm assuming that you've either weighed your patient and used \$VAL to enter the value earlier in this SOPHIE, or else you've used \$FETCH to look back and find a recent weight from the patient's record. In either case you will have assigned the variable W to that value; you will need to have done something similar to assign the variable H to your patient's height.

In the *Expression* you can either enter the formula as $B=W/(H*H)$ or $B=W/(H^2)$ (which amounts to the same thing)—the body weight in kilos divided by the square of the height in metres.

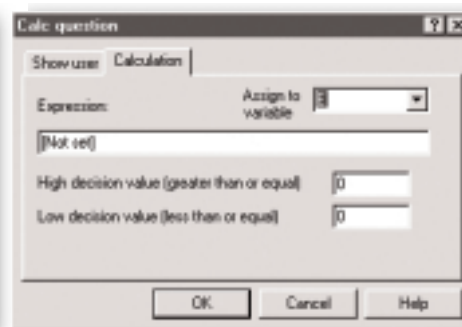


Fig. 3

Note the use of the brackets to determine the order in which the expression functions—as in all arithmetical calculations, the part in brackets takes precedence over the rest of the formula, which would otherwise work from left to right, with a different result. (If you don't believe me you can work it out for yourself!)

The *High Decision Value* and *Low Decision Value* fields are treated in exactly the same way as we used when discussing the \$VAL question. These are values which this SOPHIE question will use to determine which output pathway from this question is used to move on through the rest of the SOPHIE. In our example for BMI it might be useful to use the figures 25 as the High value and 19 as the Low value, for obvious reasons. On the other hand you might simply want to use this question to pick up those patients with potential medical problems. In this case you might still want to have 19 as the Low value, but increase the High value to 30, to pick up those patients with clinical obesity.

And that's the \$CALC question! The output pathways are similar to many other SOPHIE questions which we covered right at the beginning of the series.

It's time to move on to practical examples of uses for this question. Basically you can use \$CALC whenever you need to do sums in a SOPHIE.

- As I mentioned earlier in this series we don't yet have Path Links in our area so for the last nine years our reception staff have been using a

SOPHIE I wrote to enter Lab Results into the patient record. Indeed this SOPHIE proved so popular that there are at least 100 practices out there who are also using the same protocol! Both haematology and biochemistry results can use \$CALC to enable significant short-cuts in data entry.

For instance, once you've entered the red cell count, haemoglobin, and mean cell volume (and assigned those values to variables) all the other red cell parameters can be worked out using \$CALC. The haematocrit is simply a function of red cell count and mean cell volume, for instance, so the value can be worked out, assigned to the relevant code and saved to the record in the usual way. A similar method works for mean cell haemoglobin and MCHC.

- There is also an arithmetical relationship between the various parameters recorded as part of a lipid screen. The laboratory may have already worked out the values and printed them on the paper result but it will save your staff time if your SOPHIE does the same calculation automatically and codes the result.
- For the clinicians in consultation some obvious examples include calculation of alcohol units per week. Many new-patient-screening SOPHIEs include pints of beer, glasses of wine and measures of spirit as questions, but these numerics have to be translated into units of alcohol per week, as determined by the 136 chapter in the 4-byte coding set. By using the expression $A=(X*2+Y+Z)/7$

where X is pints of beer, Y is glasses of wine and Z is measures of spirit, you can determine the value of A, which is units of alcohol per day.

- Asthma management frequently makes use of peak flow scores and the percentage of predicted values, or percentage of personal best scores. This is where life gets interesting—using the \$FETCH question to get a predicted or personal best (PB) score from within a recent time interval and then comparing today's value should be straightforward enough, but when do you use predicted comparison and when do you use personal best? There's no straight answer to this question, which has to be subjective and based on clinical knowledge of the patient. Plainly, if the patient is especially fit and instantly scores a personal best which far exceeds their predicted value then the SOPHIE should be constructed to take account of their PB. On the other hand if your patient has COPD and will never achieve a score which comes anywhere near their predicted value then you may still wish to generate a PB code and use that for future comparisons.

Risk scores make use of \$CALC questions but often use roundabout methods to achieve their aims, because the data used to determine these scores is often qualitative rather than quantitative and numerics are therefore harder to generate.

Let's use a different example to illustrate the point: suppose your risk score needs to assess whether or not your patient smokes, and the risk calculation will use the value 0 for a

non-smoker and 1 for a smoker. The calculation itself might be straightforward, but what is the best means of generating these 'numerics'?

The answer in this instance is to use a \$YN question to ask the patient whether they smoke or not. I know we haven't yet covered this type of question so you will have to take my word for the fact that it simply requires the clinician to ask the patient a question 'Do you smoke' to which the answer can only be either 'Yes' or 'No'.

The output paths for the 'Yes' and 'No' answers lead to two different \$CALC questions. Each is very simple and contains the expression $X=0$ for the non-smoker or $X=1$ for the smoker, assuming that X is the variable which will be included in the eventual formula to determine overall risk.

In this way we've been able to 'translate' a 'Yes' or a 'No' answer into a numerical form which can be handled by the \$CALC question.

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If you're having problems with SOPHIE writing one of the best means of getting a quick response is to post an e-mail onto the user group discussion lists. Because the Graphical SOPHIE Editor is applicable to System 5, System 6000 and Premiere Synergy, it probably makes sense to post your query onto the general discussion list. Contact details for these lists and for all other user group facilities can be found on page 3 of this edition of Torus as well as the TUG website.

Next time we'll be looking at moving on to \$YN in more detail, as well as other questions that require user input.