Processing Step/Walk Test Data in CamNtech software

As an intermediate step, individual calibration factors will be generated through CamNtech software. This will involve:

- Phase annotation (set end test time) – as previously described in section 6.2.2
- Checking step heights/entering walk distances – as previously described in section 6.2.1
- Masking
- Deriving Individual Calibration Factors
- (Ensure SHR has been set in database (Section 6.1.2))

6.2.3. Cleaning Step/Walk Test Data

IMPORTANT: Must be completed in software versions >4.00.50

6.2.3.1. Recovery regressions

Occasionally, there is rising data in the recovery period. The CamNtech software default ignores data where the heart rate rises for the regression, thus resulting in a regression which is unrepresentative of the entire recovery period. It is preferable for the regression to include all data (90 secs) of the recovery period. To change from the default, this can be done per file or more efficiently as batch. To change by batch:

1. Open database through access
2. Go to ReadInfo table
3. Highlight "**StepRecUseAll**" field (NOTE: If this column does not appear in the ReadInfo table, open through AH software, double click on recovery HR (as described in step 8 below), then close database and re-open in access, the column should now appear)
4. Hold Ctrl & F to bring up Find and Replace function
5. Click on Replace tab
6. Enter as below: Find What: **0**, Replace with: **-1**
7. Click on Replace All (This will input a -1 in the Variablility files although this has no effect)
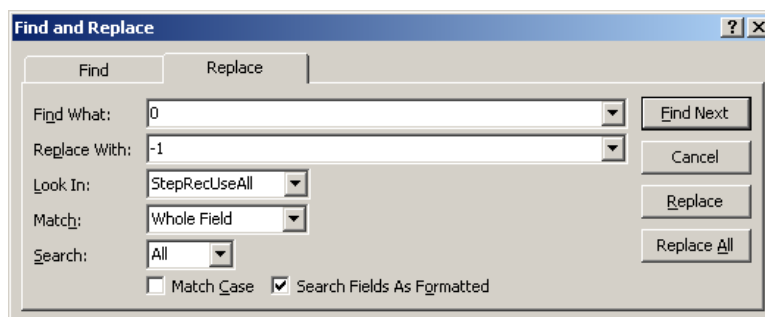

0 indicates default where rising data will be ignored
-1 indicates desired regression where all data will be included in calculation

8. Once the default has been changed (by completing the above stage), the recovery regression will appear as below:

Double click here to include all data.
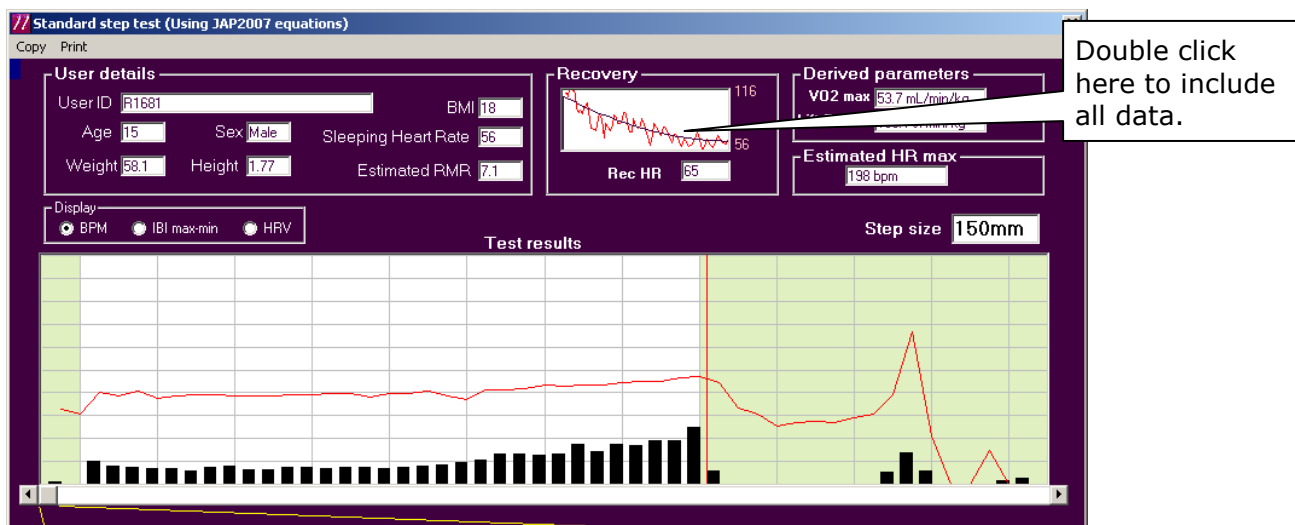
To switch back to see the regression where it ignores data if detects a rise in HR double click in the Recovery section to get the following message:
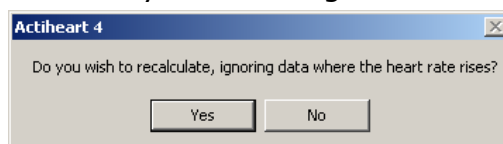
When click yes this will display the newly calculated regression (this will change the default in the software back to "0"). The RecHR is altered and the derived parameters will be altered.
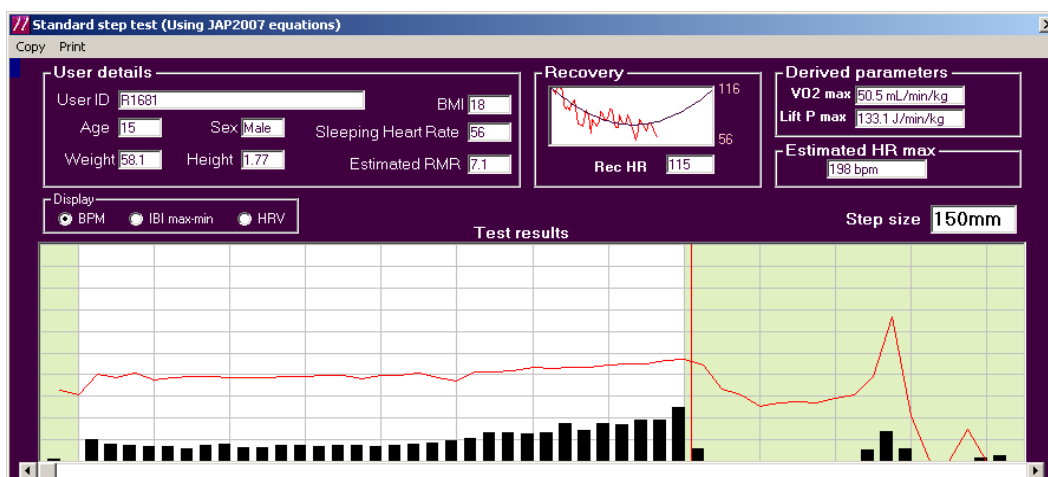
To switch back to using all recovery data is used, double click on the Recovery section and click yes to the following message.
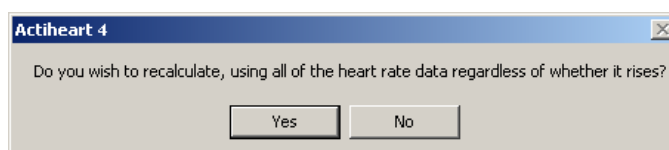
NOTE: (The database will save the last selection the user made to the open file automatically).

6.2.3.2. Masking Step/Walk files:

All Steps tests should be annotated regardless of length.

If a participant has two or more Step test with one being of a considerably higher quality, the poor quality step test can be deleted so that only the good quality data is taken forward

1. Example of a Good Quality Step Test
A good step test should show a clear increase in HR and Movement over the test period, and a decrease in HR and no (or very little) movement in recovery phase.

In some cases there may not be a clear trace throughout the test and it may be necessary to 'mask' some data in order to remove it from the analysis. This can be due to bad HR/movement pick-up.

Masking can be done by double clicking at the top of the screen, in line with the data that you wish to remove, this should mean a red X appears in the Epoch that is to be masked.

2. Masking Small Sections of Data

In the example below, the majority of the trace is fine. From looking at the main part of the trace it is possible to visualise where expected heart rate should go, (the red line is what the HR actually did and the dashed line is what would be expected).

* Dashed line does not appear in software and is for illustrative purposes only

Where the HR has not followed expected patterns the trace in the bottom part of the screen is also poor quality. These sections have been masked (X) and so would not be included in calculations of regressions. In this instance, the first part of Recovery is also not included.

3. Masking All Data from a Step Test

If a participant has both unusable step tests, at least one test must be left in the database but all the data masked. This can be done by double clicking on the 1st Epoch (to mask) then hold the shift key and double click on the last epoch to mask, Red Xs should then appear throughout that section. This will make the regression equations in the bottom right hand corner appear as in the picture below (0.00, 0.00 and 0.00). This tells the analysis program not to use any of the test.

Regression Equations read 0.00, 0.0 and 0.00, indicative of completely masked test (unuseable)

4. **Masking Poor Recovery Data**

Recovery stats (Rec HR) is calculated by fitting a quadratic regression to 90 sec of data after the red stop line, and then solving this regression equation for 60 sec (thus in principle representing the point which is 1 min after the end of test). In some cases it may be that the recovery is of poor quality as well and so cannot be used. In this case by masking the whole recovery, the Rec HR will be calculated using the equation 2*SHR - 18

5. Masking Parts of the Recovery

In some cases parts of the recovery can be used, this can be seen if we place in an expected response. If you compare the dashed (expected) and Red (Actual) HR lines there is a small section in the middle of recovery which can be used, therefore this is left in for analysis. If we look at where the expected HR is at the end of recovery, this is approximately the same as the Rec HR (60 sec after stop).

6. Good and Poor Quality Data within the Same Epoch

If there is an epoch where some of the data is poor but the rest is useable that epoch is kept in as the program averages an epoch of IBIs and then removes any IBIs which fall outside a 20% range. In the example below, the first part of the epoch is good quality data however, towards the end of the epoch, there is interference. This epoch is left in as can still be used due to the previously mentioned principle.