



Data Collection Worksheet

Please Note: The Data Collection Worksheet (DCW) is a tool to aid integration of a PhenX protocol into a study. The PhenX DCW is not designed to be a data collection instrument. Investigators will need to decide the best way to collect data for the PhenX protocol in their study. Variables captured in the DCW, along with variable names and unique PhenX variable identifiers, are included in the PhenX Data Dictionary (DD) files.

1. This protocol describes the commonly used metabolic cart equipped with a canopy hood for measurement of BMR or RMR
2. Ensure that the equipment has been properly calibrated at the start of each day.
3. Ensure that the equipment is turned on and warmed up for at least 30 minutes prior to using it with a participant.
4. Ask the participant to lie down and rest quietly for about 30 minutes.
5. If the participant feels cold, offer him/her a blanket. If the participant feels hot, alter the environment to insure that he/she does not sweat.
6. Check that the monitor is in canopy mode. Change if needed (This may differ between instruments).
7. Check that the monitor is in the artifact suppression mode with a 10 min start delay. (This may differ between instruments).
8. Check that the hoses from the hood to the metabolic monitor are connected and the unit is turned on.
9. Perform a calibration of the metabolic monitor, as needed.
10. After the initial 30 minute rest period, measure the resting metabolic rate as per instrument instructions.
11. The printer should be reporting data on a minute by minute basis. If it is not printing, check the connections, printer power, or see the PRINTER SETUP.
12. Proceed with the measurement for 30-40 min.
 - The technician must remain with the participant - monitoring gas flow alarms and visually checking for labored breathing to insure that gas flow does not fail.

- The participant must remain at rest but not sleep. We recommend that you speak to the participant if you feel it is necessary to keep him/her from falling asleep. If that approach is not effective, then a second attempt could be made by a gentle "nudge." It is important that staff are careful not to startle participants in doing this; however as this could cause an increased heart rate, thereby affecting the test. Participant should always be warned verbally in advance of a physical contact.
 - Use of classical music and a relaxing poster over the bed are acceptable methods for keeping participants calm during the indirect calorimetry test. However, please do not use videos or any other strategies for relaxation
 - The participant must not talk, except when necessary to communicate a potential problem. If the participant does talk, lift their arms to scratch an itch, shift their weight to prevent stiffness etc., indicate the time and movement on the printout using a pen or pencil.
 - Confirm that the participant is still thermally comfortable.
 - If the participant has to get up because he/she needs to use the bathroom, then the measurement can be terminated, but the participant will need to start over. The measurement sequence (i.e., steps 3-13) needs to be repeated beginning with a 10 min rest in place of the 30 min called for in the basic protocol.
13. At 30 minutes, check the display data printout for a stable reading (steady state).
 14. End the measurement.
 15. Obtain the output data from the metabolic cart (time, VO₂, VCO₂, RQ, Energy Expenditure). Save the readings on a disk or other electronic format. If electronic output not available, staff will enter output onto Excel spreadsheet.
 16. Remove the hood from over the participant's head.
 17. Ask the participant to sit upright.
 18. Help the participants to their feet and be sure that they are steady. Remember that they have fasted and there is a small risk of hypoglycemia.
 19. Sanitize the canopy per local procedures.

Note: The primary safety concern is that airflow through the hood is maintained while the hood is in place over the participant's head. Loss of flow due to a rare failure of the fan in the metabolic cart or due to a loose hose will cause discomfort and in an extreme case may cause asphyxiation. Although an alarm will sound if the unit does not detect breathing, the metabolic cart technician should remain

with the participant throughout the measurement. Care should also be exercised when the participant stands-up after the measurement should dizziness develop secondary to the fast.

Post-Indirect Calorimetry Quality Check

After completion of the indirect calorimetry test, complete a quality check on the following:

1. The printout/electronic record is legible. If not, correct problem and reprint.
2. The average RQ is between 0.75 and 0.9. Values outside of this range may indicate that the participant fasted longer than 15 h (<0.75), ate within the last 6 h (>0.93), or hyperventilated during the measurement (>0.93). Other possible explanations are very high fat diets (<0.75), a weight loss diet (<0.75) or very high carbohydrate diets (>0.93). If the participant admits to a recent meal, reschedule the test.

Check that the coefficient of variation is less than 10%. Possible explanations are excessive participant movement, irregular breathing pattern, failure to suppress the first 10 min of the measurement, or instrument maintenance problems. If the first 10 min of the measurement were not deleted, manually calculate the average and SD without the first 10 min. If the revised coefficient of variation is less than 10%, record these values. If not, repeat the measurement of resting metabolic rate.

Protocol source: <https://www.phenxtoolkit.org/protocols/view/230301>