

Body Composition Laboratory

Children's Nutrition Research Centre

Statistics

Average percentage of clientele

- * 37% Research subjects
e.g. Eat Smart or Inflammatory Bowel Disease study
- * 63% Clinical patients
e.g. children with eating disorders or liver disease

Average percentage of tests conducted:

- * 45% TBK
- * 30% REE
- * 14% BodPod®
- * 11% BIA

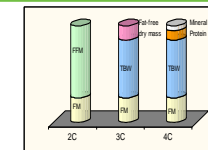


Body Compartments

- The body can be divided into two major compartments: fat and fat-free mass.
- These body compartments can be affected by various clinical conditions, nutrition or physical activity.
- The tests in the Body Composition Lab assess the body compartments and how they are affected by clinical conditions.



Body Composition Assessment



- FM: fat mass
- FFM: fat-free mass
- TBW: total body water
- 2C: two compartment model
- 3C: three compartment model
- 4C: four compartment model

Total Body Potassium (TBK)

What is a TBK Test?

- A TBK test measures the amount of potassium in the body.
- TBK is found by measuring the naturally occurring radioactive part of potassium in the body (K^{40}).
- Potassium is found in the body cell mass, that is the body's active cells.
- A TBK test DOES NOT involve a radiation dose.

Why Measure TBK?

- To determine body cell mass.
- To research conditions where body cell mass is affected.
- To monitor growth, nutritional status and rehabilitation in clinical settings.



TBK Test Protocol

Pre test requirements:

- Jewellery should be removed.
- Staff need to be informed of any nuclear medicine tests undergone in the past week.
- The patient is required to lie still on a bed which passes under

the detectors.

- The detectors count the naturally occurring radioactive emissions from the potassium in the body.
- Total test time is 40 minutes; 2 x 20 minute scans.

Resting Energy Expenditure (REE)

What is REE?

- REE is the amount of energy used while in a rested state.
- It is calculated through the measurement of gas exchange, that is the body's oxygen consumption and carbon dioxide production.



Why Measure REE?

- To assess energy requirements at rest.
- To determine optimal nutrition in clinical conditions.
- To monitor nutritional rehabilitation.
- To research conditions where energy utilisation is affected.

REE Test Protocol

Pre test requirements:

- no food for 3-6 hrs prior.
- no exercise for 24 hrs prior.
- The patient is required to lay in a rested state with a clear canopy over their head.
- Room air is drawn through the canopy at a fixed rate, while the air flowing out of the canopy is collected and analysed for oxygen and carbon dioxide levels.
- Total test time is 35 minutes.

Bioelectrical Impedance (BIA)



What is BIA?

- BIA measures the resistance of the body tissues to the flow of a small electrical current. This current can not be felt.
- The resistance to the current depends upon the amount of water in the body.
- From BIA measurements we are able to determine total body water as well as intra and extracellular water.

Why Use BIA?

- To measure total body water.
- To calculate fat free mass from total body water volumes.
- To research clinical conditions where fluid volumes or fat free mass is disturbed.
- BIA is inexpensive and easy to administer and transport.

BIA Test Protocol

Pre test requirements:

- No food for 5 hrs prior.
- No exercise for 12 hrs prior.
- The patient is required to lie still with electrodes placed on their hands and feet.
- Leads are connected to the electrodes and a small current is passed through the body.
- Total test time is 10 minutes.

BodPod®

What is the BodPod®?

- The BodPod® uses air displacement to measure the volume of the body.
- From the measurement, fat and fat free mass can be determined.

Why Use the BodPod®?

- To monitor nutritional status in clinical conditions.
- To research conditions where the body compartments are affected.
- It is a quick and easy method.

BodPod® Test Protocol

Pre test requirements:

- No food or exercise for 3 hrs prior.
- All jewellery needs to be removed.
- Dressed in swim togs and cap.
- The patient is required to sit still in the BodPod® for 2 x 1 minute periods.
- This is followed by a lung volume measurement in the BodPod®, where the patient is required to breath into a tube for 1 minute.
- Total test time is 10 minutes.

