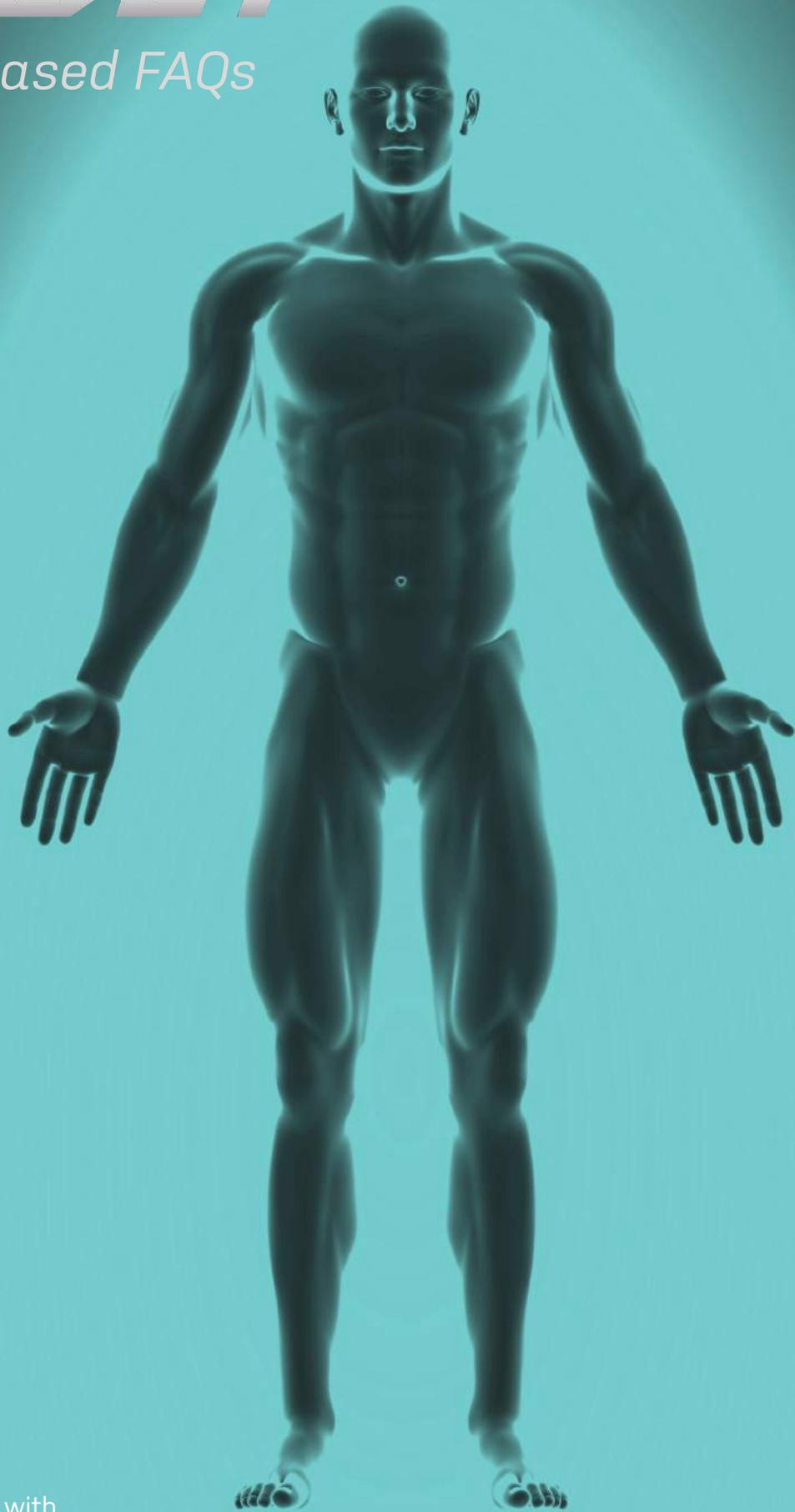


EVOLT

Evidence Based FAQs



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EVOLT



Evolt 360 Evidence Based FAQs
Version 2

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1. When is the best time to test for a scan?

Whilst not always possible, the recommended time to scan would be under the following conditions –

- First thing in the morning after emptying the bladder
- In a fasted state (ie no food prior to scanning)
- Well hydrated (Indicated by clear urine)
- No consumption of caffeine or caffeine containing supplements
- No training or activity that raises body temperature

2. Why did my scan results differ from a DEXA scan?

BIA uses a multi frequency method to measure the resistance of the current flowing through tissue. DEXA is a dual energy x-ray that measures density of tissue and is the gold standard of Bone Density measurements in medicine.

DEXA provides a measure of body composition using dual energy x-ray whereas BIA incorporates an alternating multi frequency electrical current as a mode of analysis, therefore, variation between a BIA and DEXA is anticipated. Additional factors that will contribute to this variation may include –

- Different time of the day
- Different food contents & hydration as well as medications or supplementation that read differently through the resistance of BIA
- DEXA treats breast implants as a foreign tissue and are included in the bone measurement whereas BIA treats breast implants as fat tissue and included in the fat measurement
- Different DEXA machines can also show quite varied results depending on the brand of DEXA.

The take home message for any body composition measurement is to use the exact same device at the same time of day and with the same food contents, hydration status, the same supplements and medications as well as in an untrained state. Consistency is key for repeatability of results.

3. Why are my results different to my Skinfold test?

Skinfold measurements are a measurement of subcutaneous fat only and will never reflect the Total Body Fat measurement on the BIA scan, which also includes visceral fat as well as subcutaneous fat.

Skinfold measurements are subject to a very high degree of inaccuracy and rely on a skilled individual to take the measurements who is qualified in anthropometry. Unless you can anticipate the exact same skinfold pinch every time, the consistency in readings is often unreliable.

Of course, skinfold measurements are beneficial for physique competitors who use skilled coaches to measure a subcutaneous metric, but, this is only fat tissue under the skin.

4. I used a different BIA device previously and my follow up results are different on the Evolt 360.

It is not recommended to compare scan results between different brands of BIA devices.

Some brands of BIA may incorporate default algorithms with pre-set age, height or gender which will provide an incorrect measure of body composition as referenced in published research, including the work of *Aragon et al (2017)* and *Meleleo et al (2017)*, the accuracy of BIA is reliant based on 5 variables, namely factors which are (i) Gender, (ii) Age, (iii) Height, (iv) Weight & (v) Impedance Value. As forms of BIA analysis are consistent with other types of body composition measurement devices such as DEXA and Bod Pod, whereby the accuracy of the algorithm relies on population statistics. Irrespective of the method of body composition, variation between brands of equipment is likely to occur, for example, undertaking a scan on two different brands of DEXA will be expected to produce variation in results..

We recommend that you use the Evolt 360 Scan as a baseline measurement and keep using the Evolt 360 scan to measure progression in a standardized state.

5. How often is it recommended to scan?

To ensure consistency of progressive measurements that are consistent with your training and nutrition goals, we recommend scanning every 4-6 weeks. You should expect to see a result in 4 weeks if you are following the right training and nutrition protocols.

6. How do I understand my scan?

There is a detailed, number referenced explanation of your scan results on the rear of your printed Scan Result Sheet or at the bottom of your Scan Result on the Evolt Active App. Alternatively, we also have a video explanation can be viewed on our website www.evolt360.com.

7. I did a follow up scan and I lost muscle and gained fat?

There are various reasons this scenario can occur depending on nutritional Intake, training regimes and lifestyle.

Firstly, you should check whether your nutrition has been sufficient to meet your calorie deficit requirements.

It is not uncommon for people to severely reduce calories and substantially increase cardiovascular training in an effort to see significant and quick weight loss. Severe calorie reductions may result in a decrease in skeletal muscle mass and increase in body fat if the training demands are too high, which will be reflected In the scan result..

This scenario of high training volume can be common in people who commence HIIT style training with severe calorie restriction.

We recommend checking your macronutrient requirements using MyMacros on the Evolt Active App and testing with at least 2 weeks full adherence.

It is also important to check that you undertake follow up scans under the exact same circumstances as you did previously ensuring the same food consumption, same hydration, same time of the date, same un-trained status, same medications and/or supplements and also the same week in the menstrual cycle (if you are female)

8. I didn't get the results I was hoping for?

As previously mentioned, it is important that your first and follow up scan is completed under the exact same circumstances being the same time of day, same food consumption, same hydration, same time of the date, same un-trained status, same medications and/or supplements and also the same week in the menstrual cycle (if you are female)

Depending on the time frame between scans and the results you were looking to achieve, ensure that you have followed/checked the following steps –

- Full adherence to training activity.
- Full adherence to nutrition strategy inclusive of meeting calorie deficits or surplus and ensuring the right macronutrient break down for your goal.
- Ensure supplementation and/or medications remain the same during the time frame.

Essentially though, if results are not as expected, changes need to be made to either your training or nutrition protocols. The beauty of being able to scan on the Evolt 360 is the ease at which you can assess feedback on whether your nutrition and training is right for the goal you are trying to achieve.

9. I'm competing in Bodybuilding, will the Evolt 360 track my prep?

Yes, the Evolt 360 will track changes for a Physique contest whether it be for a bikini athlete or body builder.

Physique sports such as body building are judged purely in a physical appearance so genetics and muscularity become an important aspect. In terms of body fat, physique athletes are not judged on a body fat percentage measure so determining body fat for the stage is impossible to ascertain given that some people can look visibly leaner whilst carrying a higher body fat percentage.

From an individual perspective, the physique athlete should use the Evolt 360 to track their progression throughout the contest prep then use those metrics to gauge their progression in future contest preps.

If there is a significant change during the contest prep such as the addition of supplementation or anything that significantly affects hydration, be aware that there may be some inconsistencies in readings. To ensure consistency and reliability in progressive readings, consistency around conditions must be maintained.



10. I look lean but my body fat is high?

Visible leanness does not always reflect an individual's total body fat content. In other words, some individuals can look leaner than they actually are. This may be influenced by a number of reasons, including individual body fat distribution characteristics; however, one reason could be due to the fact that the high body fat is made up of significantly high visceral fat mass which is the fat that surrounds internal organs.

Visceral fat cannot be determined visually, therefore it is not uncommon for some people can look leaner than they perceive themselves to be when they look in the mirror.

As previously mentioned, it is important to assess consistency in readings and under the following conditions –

- First thing in the morning after emptying the bladder
- In a fasted state (ie no food)
- Well hydrated
- No consumption of caffeine or caffeine containing supplements.
- No training or activity that raises body temperature

Despite body fat reading higher than expected by the individual, the validity and reliability of the Evolt 360 will provide consistency in progressive readings.

11. Why does my weight and body fat fluctuate throughout the day?

Body composition metrics will fluctuate throughout the day in response to changes in blood volume, hydration, timing and type of food and fluid intake, hormonal changes, digestion rate and gut contents, activities of daily living, exercise, the environment and body temperature. Changes in body weight and body composition throughout the day is subject to variation and It is for this reason that having your scans in a standardized format is highly recommended for consistency of results. Scanning in the morning will be expected to produce a result that is likely to vary from scanning in the afternoon or night due to day to day variation in individual lifestyle considerations as listed above.

12. I am shredded and an endurance athlete, why is my visceral fat high?

Visceral fat levels do not correlate directly with the amount of subcutaneous fat in the body or activity levels such as high endurance capacity. Visceral fat may be influenced by genetics, hormonal levels, lifestyle and nutritional intake. Visceral fat also contains a high concentration of glucocorticoid receptor (GR) which provides a site for stress hormones such as cortisol to bind with and contribute to an increased accumulation of adipose tissue around the internal organs of the body. Total body fat results may also be influenced by fat contained within organs such as the liver, heart and pancreas, known as Ectopic fat, that is also independent of lean body mass and general fitness levels.

total body fat levels may be attributed to a number of different variables, such as, including lifestyle, nutritional status and individual fat deposit variability, hormonal influences, such as high cortisol levels associated with high training volume, poor sleep and work stress, all of which may influence a higher visceral fat due to an increase in cortisol or insulin resistance. Due to the location of visceral fat in the human body, an individual cannot estimate or predict their visceral fat levels, unless they have scanned using BIA technology or performed a DEXA scan.

13. Is the BIA scanner safe to use?

Bioelectrical Impedance Analysis has been used in medicine for many years and is completely safe to use as it does not use any form of radiation.

14. Who should not use the Evolt Scanner?

We do not recommend the use of BIA technology for individuals who may be pregnant or have an implant device such as a cardiac pacemaker or implantable cardioverter defibrillator

15. What is the difference between Mineral Content + Bone Density?

Bone Mineral Content refers to the calculation of the weight of the bone mineral which can be established via BIA readings. Bone Mineral Density refers to the density of the bone which can establish diagnosis of conditions such as Osteoporosis, treatments relating to osteoporosis or risk of fracture injuries. Bone Mineral Density tests are performed by a qualified radiographer using a DEXA scan.

16. How do medications affect my result?

Whilst it is important to always scan under the exact same conditions for consistency and repeatability, there are a number of medications that can alter a scan result where the medications significantly change hydration status, blood volume and body temperature changes. The most notable being –

- Medications that influence ICW / ECW (intracellular water • & extracellular water) and Nitrogen retention - influence interpretation of protein / mineral measures, soft lean mass etc. Creatine, anabolic, beta 3 agonists, peptides etc. will influence the result.
- Hydration status - as in euhydrated in this case and influence of things like caffeine intake, pre-workouts, diuretics, thermogenics. (dehydrated normally • overestimates body fat).
- Other medications that may influence blood volume including things like Metal Plates, Pins & Gut contents.
- Water Compartmentalization including Sodium • and Potassium (intracellular electrolyte) retention particularly from the use of diuretic medications.
- Iron status - anaemia vs hemochromatosis - high ferritin = increase red blood cell mass = increase blood viscosity = influence BIA interpretation of total body water and lean body mass - as in register higher soft tissue and total body water therefore may result in reduced measure of total body fat etc. (anaemia may do opposite).
- Drugs that increase blood flow via vasoconstriction - changes blood volume and ECW / TBW ratio which influences the interpretation of fat mass, these may include stimulants (Ritalin, Dexedrine, Adderall and Pseudoephedrine (Sudafed)

17. Will the scanner read me correctly if I use steroids?

BIA provides an analysis of the human body at the time the scan is performed, reflecting the body composition of the individual at that time. As with any form of body composition analysis, including all forms of BIA, Bod Pod and DEXA, medications, including steroid based medications, will influence the results due to the role of those substances in the body, particularly with respect to intracellular and extracellular water and nitrogen retention within lean muscle tissue. As previously mentioned, steroid medications and other medications that alter hydration status such as creatine, beta 3 agonists, peptides etc. will influence the result where it relates to Lean Body Mass, in particular, Total Body Water.

It is important to always scan under the same conditions each time with the same variables to ensure consistency and repeatability of results.

18. I just ate a meal, will this change my scan results?

Consuming food will show a minor change in your scan result. It is always best practice to scan on an empty stomach, however, you can still scan after eating a meal, so long as you re-scan under the exact same conditions each time you scan.

19. Is it safe to have a low body fat %?

Your Body Fat % is individual to you and it depends on your genetics whether you can maintain low body fat in a healthy sustained manner. You should discuss your body fat percentage with your healthcare professional, however World Health Organization Standards list the following body fat percentage tables as a comparable measure (see table below)



ACSM Body Composition (% Body Fat) For Men and Women

Male	AGE				
Fitness Category	20-29	30-39	40-49	50-59	60+
Essential Fat	2 - 5	2 - 5	2 - 5	2 - 5	2 - 5
Excellent	7.1 - 9.3	11.3 - 13.8	13.6 - 16.2	15.3 - 17.8	15.3 - 18.3
Good	9.4 - 14	13.9 - 17.4	16.3 - 19.5	17.9 - 21.2	18.4 - 21.9
Average	14.1 - 17.5	17.5 - 20.4	19.6 - 22.4	21.3 - 24	22 - 25
Below Average	17.4 - 22.5	20.5 - 24.1	22.5 - 26	24.1 - 27.4	25 - 28.4
Poor	>22.4	>24.2	>26.1	>27.5	>28.5

Female	AGE				
Fitness Category	20-29	30-39	40-49	50-59	60+
Essential Fat	10 - 13	10 - 13	10 - 13	10 - 13	10 - 13
Excellent	14.5 - 17	15.5 - 17.9	18.5 - 21.2	21.6 - 24.9	21.1 - 25
Good	17.1 - 20.5	18 - 21.5	21.3 - 24.8	25 - 28.4	25.1 - 29.2
Average	20.6 - 23.6	21.6 - 24.8	24.9 - 28	28.5 - 31.5	29.3 - 32.4
Below Average	23.7 - 27.6	24.9 - 29.2	28.1 - 32	31.6 - 35.5	32.5 - 36.5
Poor	>27.7	>29.3	>32.1	>35.6	>36.6

Taken from ACSM'S Health-Related Physical Fitness Assessment Manual, 2ndEd. 2008. pg 59.

20. Are any illnesses linked to high body fat or high visceral fat?

High levels of total body fat can have substantial impact obesity related diseases such as –

- type 2 diabetes
- high blood pressure
- heart disease and strokes
- certain types of cancer
- sleep apnea
- osteoarthritis
- fatty liver disease
- kidney disease
- pregnancy problems, such as high blood sugar during pregnancy, high blood pressure, and increased risk for caesarean delivery (C-section)

High visceral fat is associated with an increased risk and incidence of obesity related diseases include type 2 diabetes, insulin resistance and inflammatory conditions due to an increase in pro-inflammatory mediators within the body leading to adverse health outcomes and higher mortality. Visceral fat Visceral fat is generally recommended to account for approximately 10-20% total fat in men and 5-8% in women.



21. How does your technology differ from other BIA products on the market?

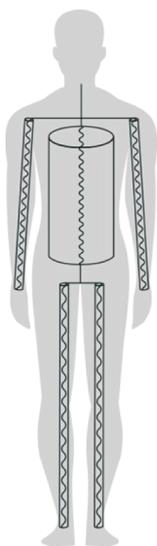
Bio-electrical Impedance Analysis (BIA) Incorporates a low intensity electrical current that passes through the body to determine muscle mass, fat mass (including visceral and subcutaneous), water and mineral. The technology used by Evolt is consistent with all forms of BIA and is identical to other BIA products on the market.

22. Is there such thing as a direct measure in BIA?

BIA is a form of indirect body composition measurement (Aragon, et al 2017). All forms of BIA incorporate scan methodology that involves the passing of a safe electrical current through the body at an alternating frequency to differentiate body fat, muscle and other soft tissue and as such, forms an indirect form of analysis. DEXA, air displacement plethysmography (BodPod), Skinfolts and BIA all comprise indirect forms of body composition analysis. The only forms of direct body composition analysis are total body water volume measured using an isotope dilution, total body counting using radioactive potassium 40, neutron activation, and post mortem cadaver analysis (Duren et al 2008).

23. How does the scanner work?

Bio-electrical Impedance Analysis or Bio impedance Analysis (BIA) works by passing a safe, low intensity electrical current through the body via the tactile points on the machine (feet and hands). The response of biological tissues to an alternating electrical signal applied produces a bioelectrical impedance which is a function of tissue composition as well as the frequency of the applied electrical signal. Impedance varies with tissue structure, tissue composition, tissue health, and signal frequency. The resistance to flow of the alternating current determines the difference between muscle mass, fat mass (including visceral and subcutaneous), water and mineral.



BIA USES A 5
COMPARTMENT
MEASURING METHOD

24. How accurate is the scanner?

BIA has been used comprehensively in scientific research to determine body composition and has been established as an accurate and reliable form of measurement.

25. Do I need to fast before a scan?

The contents of the stomach and gastrointestinal tract can influence the result of the BIA scan so it is recommended that for the most accurate and reliable results, the scan be undertaken with an empty stomach. It is not a compulsory requirement of the BIA scan to fast for an extended duration prior to the scan, rather, we recommend you participate in any follow up scans with as close to the conditions as your original scan as possible.

26. I did a scan back to back and the results changed slightly?

A small amount of variation, even with back to back scans, is common with all forms of indirect body composition analysis, including BIA, DEXA, Bod Pod and skinfolds etc. In the event that a small amount of change in result exists, we recommend as a starting point that you ensure the contact points (feet and hands) of the BIA are positioned correctly, as this is a common source of scan variation.

27. I scanned at different times of the day and my results changed?

Variation in scan results at different times of the day will almost certainly occur due to changes in hydration status, stomach and GI tract contents, blood volume shifts and variation in hormone levels which is a normal aspect of bodily function. To avoid variation in scan results, we recommend scanning at the same time and day of the week for follow up scans.

28. How do my breast or buttock implants affect my scan?

BIA will interpret silicone and saline implants as fat whereas a DEXA scan will interpret breast or buttock implants as bone, which is why direct comparison between different types of scans is inconsistent and can be misleading.

29. Pins, pacemaker, metal plates List all other devices that could be in the body and why they cant scanner or how the scanner will scan them

Metal implants will demonstrate high conductance and low impedance of the alternating electrical current that is used with BIA scanning in a similar manner to tissue that has a high water content such as skeletal muscle. Accordingly, metal implants will impact the scan result and will likely indicate that a person has a higher level of lean body mass that will be representative a lower overall body fat percentage.

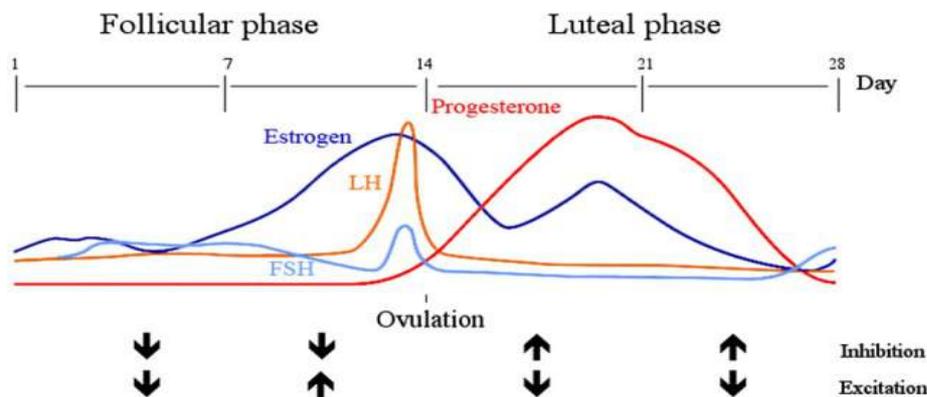
30. Why should pregnant people not scan on the Evolt 360?

While BIA scanning can safely be undertaken during pregnancy, we recommend women do not scan during pregnancy simply because a woman will experience a large amount of change in body composition over the course of the 40 week pregnancy, simply by nature of the baby's development over that period. Maternal weight gain in pregnancy is widely considered necessary for an adequate foetal development and development rates of the baby will vary considerably over each trimester of the pregnancy and the increase of maternal weight will depend on changes of various anatomical foeto-maternal structures (foetus, uterus, amniotic fluid, amniotic membranes, placenta), maternal body fat and breast tissue as well as total body water (TBW). TBW increases during pregnancy by about 5–8 litres and the composition of lean tissue changes as pregnancy progresses, thereby compromising the ability to obtain an accurate estimate of pregravid weight status and/or body composition immediately before or early in pregnancy and affecting the validity of body composition change estimates. Accordingly we recommend women refrain from BIA scans during pregnancy.

31. How does the Evolt 360 measure visceral fat?

Visceral adipose tissue (VAT), deposited in the intra-abdominal cavity and surrounding the internal organs, is associated with a variety of metabolic risk factors, is a predictor of premature mortality and is causally implicated in the development of disease through a variety of different mechanisms. BIA assumes the human body as a series of 5 cylinders comprising each of the upper and lower limbs and the torso. By independently measuring each cylinder, the BIA has the ability to determine the regional distribution, including visceral fat levels in the body.

32. Will menstruation change my results?



It is important to maintain consistency around scanning throughout the Menstrual Cycle as there are significant fluid changes around hormonal shifts. As you can see in the diagram, during the luteal phase, progesterone rises which has a natural diuretic effect. Whereas, in the follicular phase, estrogen rises which can increase fluid retention significantly. The recommendation is to always scan in the same phase of the menstrual cycle ie. in the follicular or luteal Phase, within the same few days.

33. Links to BIA validation studies

- Aragon et al. (2017). International society of sports nutrition position stand: diets and body composition. Journal of the International Society of Sports Nutrition. 14:16 DOI 10.1186/s12970-017-0174-y
- Bera (2014). Bioelectrical Impedance Methods for Noninvasive Health Monitoring: A Review. Journal of Medical Engineering. Article ID 381251, <http://dx.doi.org/10.1155/2014/381251>
- Ling et al (2011). Accuracy of direct segmental multi-frequency bioimpedance analysis in the assessment of total body and segmental body composition in middle-aged adult population. Clinical Nutrition 30; 610-615
- Meleleo et al (2017). Evaluation of body composition with bioimpedence. A comparison between athletic and non-athletic children, European Journal of Sport Science, 17:7, 710-719, DOI: 10.1080/17461391.2017.1291750
- Duren et al (2008). Body Composition Methods: Comparisons and Interpretation. J Diabetes Sci Technol. 2(6): 1139-1146. doi: 10.1177/193229680800200623