



**Dr Jarrod Meerkin PhD., M.Sc.(Hons), B.App.Sc (Exercise Science), MAAESS AEP.
Director/Exercise Physiologist, Body Composition Australia**

Body Composition Australia says 'fat loss' and not 'weight loss' is the important issue. When you stand on the scales the weight of muscle, bone, skin, teeth, hair and fat are all being measured? Do you really want to lose anything other than the fat? The other issue is muscle tissue gain. People have been disappointed in the past when the scales haven't registered any change, even though your clothes feel looser on you. You can't tell the scales that you have been exercising at the gym and building muscle. The only way to measure actual fat loss and/or muscle gain is by measuring "body composition" or the percentage of body fat vs. lean mass (muscle).

How do we do this?

Body Composition Australia uses the worlds most advanced scanning technology from Hologic, USA. Dual energy x-ray absorptiometry (DEXA), assesses total body bone mineral density and highly accurate measures of the body's soft tissue composition (muscle mass and fat mass). By measuring your body's muscle mass, fat mass, and bone mineral density, Body Composition Australia can determine your total body fat percentage, and changes in regional body composition. We also undertake specific measures to determine your risk of Type 2 Diabetes and heart disease. Having a DEXA scan is as easy as lying on a "table" for about 6 minutes. You stay in your clothes, it's totally painless and there's no need to worry about claustrophobia. The amount of radiation used in a typical DEXA scan is very low (1-4 microSieverts), compared to radiation exposure of approximately 10 microSieverts on an airline flight from Sydney to Melbourne or 40 to 50 microSieverts during a typical chest x-ray.



The benefits.

We then use these results to provide specific quantitative information on your resting metabolic rate and energy expenditure, helping you and your trainer achieve your health and weight loss goals and improved total body health. The motivational effect of tracking your body composition cannot be stated strongly enough. Using DEXA to determine the proportion of lean body mass (muscle) versus total body fat is a valuable clinical tool in the management of long-term health and fitness. By assessing changes in body composition over time, your trainer is more able to customise their training to achieve specific physiological goals. For those seeking lifestyle changes and weight loss, DEXA body composition measurements provide accurate exercise effectiveness assessments and soft tissue analysis. With a greater understanding of how your body is responding to the changes made, clients are more inspired to persist with and maintain their newly adopted lifestyle.

**Contact Body Composition Australia on 02 9331 7822 or
email jarrodmeerkin@holdsworthhouse.com.au**

and visit our website for more information at www.bodycomposition.com.au

Dual Energy X-Ray Absorptiometry



The term 'DEXA' stands for Dual-Energy X-ray absorptiometry. X-rays are the form of radiation used, and two different energy levels of X-rays are needed to provide enough data to separate bone and non-bone areas of each scan.

DEXA instruments use narrow, tightly collimated X-ray beams. The X-rays are generated below the supine patient, travel upward through the patient, and are detected above by banks of electronic detectors.

A computerised image is generated, which the operator uses to identify regions of interest and analyse the scan.

Image generated by DEXA

DEXA analysis is based on the principle that bone areas will reduce the signal (attenuate) of the higher-energy X-ray, while soft tissue areas will allow the signal to pass through. Using this information, the image generated by the scan will first be analysed to calculate the bone threshold and identify bone and non-bone points.

The attenuation of X-rays by pure fat and non-bone lean tissue is known, and the analysis proceeds on a point by point basis. Each point is evaluated and subdivided into fractions of lean and fat. The end result is a determination of total body levels of lean, fat, and bone mass.

DEXA Process



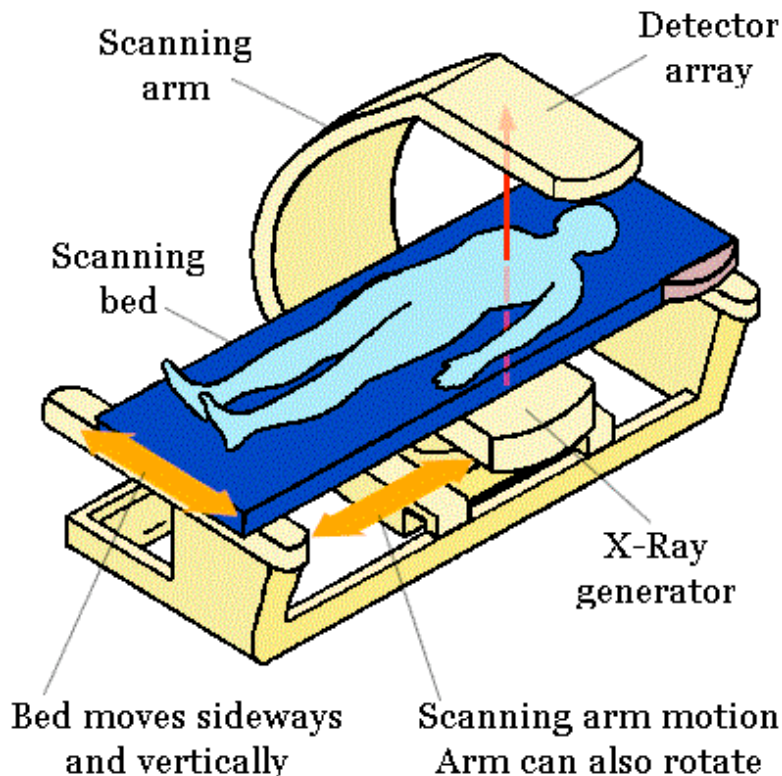
DEXA scan in progress

Image generated can be seen in the foreground.

Because a DEXA instrument will detect any extraneous materials, patients undergoing a DEXA scan usually change into hospital gowns or thin scrub suits. All jewellery and other metals are removed. Patients lie quietly on a scanning bed with their arms at their sides. The scanning arm begins at the top of the bed (above the patient's head) and moves slowly toward the foot end. Most adult DEXA scans take about 15 minutes, but the shorter you are, the quicker the scan.

The amount of radiation used in a typical DEXA scan is very low. The effective dose for a whole body scan is less than one tenth of a standard chest X-ray. Because of the directional X-ray beams used, the DEXA operator may stay in the room during a scan, and no additional shielding is necessary.

DEXA Schematic



This is a sketch of one type of DEXA instrument. Other models may move differently, but the scan process is basically the same. Usually, both the bed and scan arm move during the test, while the patient lies completely still.