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Aging Well Part IX

Changing Your Basal Metabolism Rate

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In the November 20, 2003, *Examiner*, we discussed the basal metabolism rate and showed how it changes with age. Today's discussion goes into more detail about the basal metabolism rate (BMR) and about how to change it. Your metabolism changes with the seasons, with age, and even with the time of day. It speeds up when we eat, and slows down when we don't.

The BMR slows down about $\frac{1}{2}$ of 1% per year after the age of 25. This means that at 60 years of age, just to live, the typical person needs about 17% fewer calories than they did at age 25. Therefore, if you needed 2,000 calories per day at age 25, at age 60, you will need only 1650. If you keep eating 2,000 calories a day, you will accumulate 350 extra calories every day, which means in 10 days you will gain one pound. In one year, you will gain almost 40 pounds.

BMR Slows

There are multiple reasons for the slowing down of the BMR, but the principle one is that you lose about one half pound of muscle each year after the age of 25, if you do not exercise. That means that if you weight 200 pounds at age 25, if you are typical, and if at age 60 you still weight 200 pounds, you will actually have accumulated seventeen more pounds of fat. This means that your body fat percent will have gone up by almost 10%.

Basal Metabolism

The word "basal" means base (as in baseline.) Basal metabolism is the amount of energy used to support the body's ongoing metabolic processes while the body is in a state of complete physical, digestive, and emotional rest. It includes the energy used for:

- breathing
- maintaining body temperature

- repairing and replacement of cells and cell components
- delivery of nutrients to cells and wastes away from cells
- growth
- And heart beats.

Variations in basal metabolism

Metabolism can vary tremendously from person to person. Some of the variables include:

- size,
- height,
- weight,
- gender,
- body composition,
- activity,
- season,
- environment,
- growth,
- age,
- illness or injury, and
- Nutritional status.

Basal Metabolism Facts:

- The larger you are, the more Calories required to move your body through space.
- A six foot person requires more Calories for basal metabolism than a five foot person.
- A 300 pound body uses more basal energy than a 100 pound body.
- Men burn more Calories than women. (This is partly due to differences in body composition, and partly due to differences in certain hormones.)
- The more muscle mass you have the more Calories you burn. Muscle uses approximately 35 Calories per day, just for survival. Fat (a.k.a. adipose tissue) only uses 3 Calories per day.
- In cold winter weather we need more fuel for heat than in the summer. For example, the Aboriginal Eskimo is said to have burned about 7000 Calories per day just for heat production. Conversely, people who live near the equator need less fuel. (Have you ever noticed that your appetite goes down on hot summer days?)
- And children, pound for pound, need more energy than adults. (Growth uses a lot of basal energy.)
- Most of us require fewer Calories as we age. This is partly because the body becomes more efficient at doing the same tasks repeatedly, and partly because most of us become less active physically as we get older. With declining activity comes a loss of muscle tissue, which in turn means a decrease in our Caloric requirement.

- With illness or injury our metabolism increases as the body goes about the business of healing. Think, for example, about the fever that comes with a case of influenza. Or the inflammation that comes with an injured joint. From a scratch to major surgery, if you hold your hand above the part of your body that is healing you'll feel the increase of heat pouring from the injured area. Those healing tissues are using more basal energy.
- Lastly, there's the thyroid gland. The thyroid is a butterfly shaped gland located in the neck, and surrounding the windpipe. It produces a hormone called thyroxine which serves to regulate the rate at which metabolic reactions occur in the body. As the level of thyroxine increases so does the relative speed at which reactions occur, and so does our Caloric expenditure. As thyroxine decreases, so does the speed of metabolism. We then require fewer total Calories.

For the most part the thyroid is not responsible for very large differences in body weight. Why? If your thyroid is sluggish, so is your appetite. Conversely, if the thyroid gland is overactive, so is your appetite. There are two important factors that influence your thyroid gland - (and therefore your metabolism) - that you need to keep in mind.

- The first is stress. Chronic stress increases thyroid hormone production.
- The second is dieting. Calorie deprivation decreases production of thyroid hormone. This causes metabolism to slow down to compensate for the lack of fuel. Individuals with anorexia nervosa, for example, have a basal metabolic rate which is 50 percent below normal.

Changing Your Basal Metabolism Rate

The most effective strategy for increasing basal metabolism is to decrease body fat and increase lean body mass. Remember, fat requires only 3 Kcalories per day while muscle requires 35. As a result the more body fat you have, even though you may be very large, the fewer calories you need to maintain your current weight, as opposed to someone who is the same weight but with lower body fat and with higher muscle weight.

Exercise will reduce body fat and increase lean muscle mass. By increasing lean muscle mass, metabolism will increase and aid in the weight-loss process. Aerobic exercise, like walking, swimming or cycling, has the added bonus of speeding up your metabolism for 4 to 8 hours after you stop exercising. Additional calories will be burned off long after you stop exercising.

Weight lifting, resistance or strength training, does not speed up your metabolism, but it does burn fat and increase your lean muscle mass which increases your resting metabolic rate. A combination of aerobic exercise and resistance training is best for optimal fat burning and metabolism boosting. Exercise in the morning and you will reap the benefits of a faster metabolism throughout the day, or exercise in short 10 or 15-minute bursts every couple of hours to keep your metabolism pumping. Exercise any time you can fit it into your day and you will burn that fat away. By exercising just a little more than usual you can speed up your metabolism and use up stored fat in the process.

For instance, if you walk up three flights of stairs, even after your breathing returns to normal, your body's BMR is increased for a short while, as the body restores the energy used by the muscles; do that 3-5 times a day in the ordinary course of your job and you will dramatically change your body's energy use.

Eat breakfast!

This is a novel concept: in order to lose weight, you must eat! Eating stimulates your body's BMR and breakfast is essential. Your body has been deprived of food throughout the night; therefore your metabolism has slowed. If the cells do not receive sufficient nutrients they will begin to function less efficiently on smaller amounts, and they will actually store more fat to use during these times of nutritional deprivation. Eat six small meals a day to keep your body's fuel supply consistent and keep your metabolism revved up.

Avoid eating late at night because your metabolism naturally slows down in the afternoon and evening, so eat a hearty breakfast. Consistency is important because your body metabolism adapts to your current weight. If you have been dieting or skipping meals your body's metabolism slows down to compensate for the lack of nutrients. When lean people overeat their metabolism speeds up and when obese people diet their metabolism slows down. The key is a balance of exercise and diet.

Eat fewer high-fat foods and less total calories. Choosing healthy foods, such as lean protein and vegetables, can actually increase your metabolism as well. Increase dietary fiber and limit sugary foods, alcohol, caffeine and don't smoke. The best foods to increase your metabolism and help you lose weight are fish, dark green leafy vegetables, tomatoes, blueberries and other fruits, whole grains, and at least 8 glasses of water a day.

When your cells need energy they will break down carbohydrates first, then fat and finally protein. Your body converts carbohydrates into a form of sugar called glucose which is easily used as fuel by your body. Any excess carbohydrates you eat will be turned into fat for storage. Of course, any fat you eat will be stored as fat as well. Your body converts the fat you eat into body fat very efficiently. If you exercise and eat wisely, however, you will burn those fat stores and increase your metabolism.

Ingestion of food increases BMR 10-20% for a few hours after eating. Most of the heat production is due to processing of the ingested nutrients in the liver.

BMR and weight management

The following steps will help you maintain your body weight as you grow older:

1. Make sure your thyroid is functioning normally. This can be done by a simple blood test. If it is normal, you do not need extra thyroid, which is often given to people to help them lose weight. This is not wise and can be dangerous. If

the thyroid function is diminished, which is common as we age, then thyroid medication is important.

2. Begin exercising both for aerobic conditioning and for building up your muscle strength. Both are important. Aerobic conditioning will increase your heart's health by increasing its ability to use oxygen. Strength training will increase your muscle mass which will increase your BMR and help you control your weight.
3. Change your diet. Don't stop eating, eat differently. Eat smaller meals, more often. Avoid foods or beverages which have high calories but no nutritional benefit. Alcohol has no vitamins, minerals or healthy nutrients. It is toxic to your body and can accelerate disease processes. Avoid it. In fact, almost all beverages other than water have some potential health hazards. Even fruit juices, because of their high glycemic index are not healthy.

The changes in your body are slow and slight, but the changes accumulate over time. Combat those changes with knowledge, understanding and modification of your habits. Frailty and fatness are not inevitable with aging. You can decide to make a difference in your life, after all, it is your life and it is your health.