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Exercise, Weight Loss and Fat
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Fat is more than just ugly; it is the most efficient manner in which your body stores energy. In fact, fat stores 9 calories of energy per gram. It is also the padding used by your body to fill spaces such as that between your skin and underlying muscle and bone. So you can't remove all your fat and look or function normally.

The basic unit of fat is the fat cell. When young our bodies make more fat cells as we grow. After your late teens to early twenties, you stop making new fat cells. They don't go away at this point without some help. So how do I lose and gain weight then? Simple, you fill these cells with more or less fat. Look at your fat cells as little gas tanks. They hold fat, a fuel used by your body. When you eat more than you use, the cells get filled to higher levels.

"I want to lose weight"

Weight loss can involve the loss of fat, but the loss of fat is a long process. When weight is lost over a short period of time like when you starve yourself, this weight is not fat. It is most commonly water and glycogen, another energy storage material stored in the liver. Glycogen is very quickly replaced; therefore weight quickly lost rarely stays off. The best way to lose weight (over the long term) is to exercise regularly and consistently reduce the amount of food you eat while maintaining a healthy diet.

Why Can't I lose Weight?

Typically, a normally active person will require about 15 calories per day per pound of weight to maintain their current weight. However, this figure is for those who are modestly active, which means that they sit and watch less than two hours of television a day. In reality, television not only turns the mind to mush, it also turns the muscles to the same!

A person who is inactive can require much less than 15 calories per pound of weight. For instance, a person who is sedentary – sits all day and has no physical activity either in activities of daily living or structured exercise – and who weighs 220 pounds will require approximately 1904 calories a day to maintain that weight. If that same person does light exercise one to three times a week, their calorie requirement will go up to 2182 calories. This means that they will require an additional 278 calories a day to maintain their current weight.

If a person increases their activity in this very minimal way and does not increase their caloric intake, i.e., continues to only eat 1904 calories a day, over 15 days, they will lose a pound of fat. This is because a pound of fat is a little "gas tank" which has between 3,500 and 4,000 calories of energy stored in it. To empty each fat tank you must accumulate a 3,500 to 4,000 calorie deficient either by eating less and/or working more.

If, our 220-pound person begins a moderate exercise program (walking, cycling, swimming, etc.) 3-5 days a week, their calorie requirement will go up to 2460 calories a day. This means that if that person does not increase their calorie intake, but keeps it at 1904 calories; they will accumulate a "calorie deficient" of 556 calories per day. That means they will empty a fuel cell – a fat cell – of its energy store every 6-7 days and thereby lose a pound of fat a week.

Why does a heavy person *not* need proportionately more calories than others?

If a 100 pound person needs 1500 calories a day, why does a 200 pound person not need 3,000? It is possible of the percent of body fat, which it is possible to measure. Remember, there is a healthy amount of fat in the body. Fat is not all bad. It provides energy stores to sustain the body in times of the absence of food and provides insulation to regulate body heat among other functions. Too much fat is bad however. Because of body composition and structure, women normally have a higher fat content than men. A body fat percent of 20 for a man and 24 for a woman is normal. In fact, too little fat can be as big a health problem as too much fat.

Take our 220-pound person mentioned above. If this person has 39 percent body fat, it means that 39 percent of their weight is made up of full fat cells. That means that 86 pounds of that person's weight is fat. Here is the problem. While increased fat weight slightly increases the work of carrying that extra weight around, a pound of fat only requires about 3 calories a day to be maintained. A pound of muscle on the other hand requires almost 35 calories a day of energy. Bone and connective tissue require very few calories.

If our 220-pound person has 40 pounds of muscle, their body will require 1400 calories a day to provide the energy needed by those muscles. The 86 pounds of fat, however, only requires 258 calories a day. This is one of the reasons a very heavy person, even one who weighs 300 pounds can truthfully say, "But, I don't eat very much and I don't lose weight." The reason is that they may be 60 percent fat which requires very little food to support its caloric need daily.

The only way for our 220-pound person to beat the numbers is to increase their activity and/or to change their body composition. Think about it. If the 220-pound person loses 20 pounds with diet and exercise, their caloric need each day will go down by about 60 calories (3 calories per pound of fat lost). If at the same time, through resistance training, i.e., light weight lifting, that person gains 7 pounds of muscle, their caloric need will go

up by 35 calories x 7 pounds of new muscle, or by 245 calories day. The balance would be 245 calories increase due to muscle and 60 calories decrease due to weight loss for a net change in calorie requirement of 185 calories.

If our sedentary, 220-pound person, who needed 1904 calories to maintain their body weight, increases their activity moderately 3-5 times a week, loses 20 pounds of fat and gains 7 pounds of muscle, their new daily calorie requirement will be 2645. That is a net change of 704 calories a day. Which person will have less difficulty achieving and maintaining their weight, the one who needs 1904 calories a day or the one who needs 2645? The answer is obvious.

What is the BMR?

The discussion above about how many calories a person needs is really about basal metabolism rate (BMR) which can be approximated by a formula which analyzes your height, weight and activity level. Your SETMA healthcare provider will calculate your BMR at every visit and will tell you what it is. The weight management assessment which you will be given at every visit will tell you how to change your BMR, just as we explained above. If you do not see a SETMA provider and you want to know what your BMR is, call our office and we will be glad to calculate it for you and give you that information at no cost. If you would like to know what your body fat percent is, we will be happy to give you that information without any cost, but it will require you to come by our office. Just call for a convenient time to get that done.

Complications in the BMR

Your BMR will go down, i.e., you will require fewer calories to maintain your current weight as you get older. That is why so many people get fatter as they get older. They keep eating as much, or more than they did when they were younger and active, so they gain weight. This is because as we age, for many reasons, we lose muscle. Women, pound for pound, have a lower BMR than men, also. This is because, as we said earlier, women naturally, normally and healthily have more body fat than men.

What Exercise is best for losing fat?

A combination aerobic exercise with light weight training is best. Aerobic exercise results when your heart rate is increased by waking, swimming, biking or other activity so that it is sustained between 60-80 percent of your maximum expected heart rate. You can calculate this number by subtracting your age from 220 and multiplying by .6 and then .6. For instance a 74 year old person's calculate maximum heart rate is 220 – 74, or 146. Your maximum heart rate can be measured with a cardiopulmonary exercise test (CPET) which can be performed at SETMA if you are committed to excellence in your health. A 74-year olds heart rate range for aerobic exercise is 88-118.

CAUTION: No one over the age of 50 ought to start a vigorous exercise program without having an evaluation by their physician first.

In addition to aerobic exercise, resistance training, i.e., weight lifting, helps lose fat by building muscle and raising the BMR. This does not mean that you have to "bulk up" or lift large weights. Starting low, even with 3 pounds, with 3 sets of 14 repetitions is a great place to begin. You may never go over 5-6 pounds but you will tone your muscles and build muscle even at that rate.

The following principles will help you burn more fat with your exercise program.

- Regularly incorporate aerobic workouts that are low intensity for a longer duration. The majority of the research shows that women derive a greater proportion of their energy expenditure from fats during low to moderate intensity exercise, relative to men. Thus, this will improve fat metabolism, particularly for females.
- Incorporate some aerobic workouts that are of higher intensity for a shorter period of time. This may best be realized with high intensity continuous training, i.e., walking or running faster for short periods. As exercise intensity increases, the percent of energy derived from fat decreases. However, the absolute amount of energy derived from fat is actually increased, for males and females. But, as exercise intensity increases, so does total energy expenditure (caloric expenditure), which means that even though a smaller percentage of the energy expenditure is coming from fat, more calories of fat are burned, because there is a greater absolute energy expenditure.
- Incorporate various modes of training, often referred to as cross-training. The theory of multi-mode training implies that by training on different modes of exercise, the body is averted from getting overly fatigued and from overuse of the same muscles in the same movement patterns. This helps to thwart the occurrence of musculoskeletal system stress, aiding in the prevention of muscle soreness and injuries. Therefore, theoretically, a person will be able to safely do more work, more frequently, which equates to higher total energy expenditure and fat utilization.
- Vary the above workout designs regularly! Endeavor to find a satisfactory method where aerobic workouts vary either within each week, weekly, bi-weekly, or any combination of all. Similar to the above, varying the workouts provides a new stimulus to the body's cardiorespiratory system in an effort to avoid the consequences of overuse exercise fatigue.

Remember, it is your life and it is your health.