

EXERCISE PROGRAM

As reviewed in the Goal Setting Section of these articles, exercise is a very important component of a diabetes control program. Exercise is the energy expenditure end of the metabolic equation balancing food and calorie intake with energy use. Humans like many longer-lived creatures have a tendency to gain weight throughout life. Weight gain in the first decades of life is due to disproportionate calorie (food) intake compared to energy utilization. But in the later decades of life it's not the food intake that changes so much, but the energy utilization that drops. The accompanying weight gain that occurs contributes to the development of hypertension, diabetes and atherosclerosis. These diseases of aging have been shown to be highly sensitive to changes in weight. The same is true with regard to their response to exercise.

Exercise can be defined as those activities we do everyday that burn calories above and beyond just our basal metabolic rate (e.g. resting in bed). Exercise can be broadly divided into "non-exercise thermogenesis", or NEAT, and traditional exercise (everything else). For a discussion of NEAT, please refer to the FAQ section of the website. Traditional exercise means everything we do to burn calories, weather conditioning our cardiovascular system or conditioning our muscles. And, as previously discussed in the Goal Setting Section, different exercises burn calories at very different rates.

How do you go about starting a new exercise program? First of all, it makes good sense to plan a program that fits with your lifestyle. If as a young adult you never participated in athletic sports, after school sports, or team sports activities, I would not recommend setting that as a goal now unless something has really changed in your life that would support that kind of a new direction. On the other hand, if in high school you participated in team sports, or played sports on a regular basis after high school, I think you're more likely to succeed with a bit more aggressive exercise program plan. If you've got bad knees, it doesn't make sense to pursue a jogging program. If you have asthma, a cardiovascular conditioning program might be difficult, unless you like to swim. If you have foot problems, you may be better off cycling than walking. So not only do you need to take into account your personal interests in sports, but it also makes sense to consider what your past history of physical activity has been as well as your physical state of health.

Before starting an exercise program, make sure you don't have any hidden health issues. If you've had diabetes for several years, if you have hypertension or high cholesterol, it makes good sense to ask your doctor about whether you should have any screening tests done before you start an exercise program. You DON'T want to uncover hidden heart disease by starting a vigorous exercise program only to precipitate a heart attack! Make sure you don't have any lurking foot problems (see the article on Diabetic Foot Care) if you are about to start a walking or jogging program. If you're diabetic and you plan to do some type of vigorous sport such as racquetball or basketball, think about getting a routine eye exam done if it's been a year or more since the last one. Sudden blindness caused by bleeding blood vessels in the back of the eye that develop in people with poorly controlled diabetes can be permanent and irreversible. This type of problem is usually preventable with proper treatment before the bleeding begins.

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When beginning and following an exercise program, it's important to maintain a sense of priorities for what you're doing. If you have diabetes, exercise, just like good eating habits, will directly affect your health in major ways. An exercise program doesn't have to be the first thing to do on your list of daily activities, but it certainly shouldn't be the last item either. You shouldn't have to make time for an exercise program. It's so important to your life and health that it should be part of what you do every day and what remaining time you have should be allocated to everything else that you want to accomplish. By this I am NOT saying that an exercise program should consume a disproportionate amount of your time. In fact, if you are doing exercise daily, there is no reason to expect that you should devote any more than 30 to 45 minutes to it. Spending an hour exercising would be extraordinary. In fact, if you are not already doing a regular exercise program, I would specifically recommend that you NOT plan to devote any more time to it than 45 minutes a day. Also, if you are developing this as a new program, your best chance at success is to make it easy to get to, get prepared to do, execute, and get changed/go on with your day as possible. A fatal mistake of many programs is that they create too much of a burden to execute on a daily routine basis, and that execution becomes an overwhelming barrier to success or sustained participation.

I believe another key to a successful new exercise program is to make it a daily event. All too often when an exercise program is three or four times a week, it gets postponed because it's given a lower level of priority – "I can always do it tomorrow." And if tomorrow turns out to be a really busy or difficult day, I'll just do the exercise program 3 days in a row. *That* procrastination is the first step in killing the new exercise program, because if it's not important enough to do daily, or do when you originally planned to do it, it may be that it's just not important enough to do at all. Ultimately you'll discover that rather than have your conscience nagging you about when you're going to next get to your exercise program, it's easier to just drop the expectation all together and not have your conscience nag you at all!

As mentioned previously, it's important not to make a new exercise program into a burdensome activity. You don't want to create an expectation in your mind's eye that you have this "exercise burden" that you're going to carry around with you the rest of your life. Rather, you want to do just the opposite. The exercise program should be YOUR TIME, your special time to get away from all the other frustrations of life and work and home, etc, and just take care of yourself. **It's your respite. It's your gift to yourself.** There are lots of ways you can do this. I personally have a setup to use a computer and to listen to CD's when I exercise on the treadmill. They could be books on CD. They could be language CDs. They could be educational CDs. I have the option to watch on-line movies. The point is that at times I DON'T WANT to stop my exercise when it's time to go. I want to finish the part that I'm listening to. During the stress of a busy day, I can look forward to my time with the next exercise session when I can get on with the next part of what I enjoy doing (listening to)! If you want to see pictures of my setup, go to the section on "Goal Setting". That is just one example. Finding a tennis partner or a racquetball partner that you really like to spend time with is another example. It's basically the same idea as putting the bicycle ergometer or the stair-stepper in front

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of the TV set when you're going to watch your favorite program. Anyone can do this. Even people in their 80s can enjoy daily exercise.

I believe it's also important to devise a way to monitor your exercise program. This will help to motivate you to achieve the goals of the program, maintain the program, and track how your body is responding to the program. If you're doing cardiovascular fitness, the obvious metric is to take your pulse, both resting before exercise and during the exercise activity. Resting heart rates around 60 or 70 are common, with people in good condition often in the 50's or even 40s. Olympic athletes can get down to the low 40's. How do you determine how rapid a heart rate (beats per minute) you should achieve during your CV workout? Research indicates that people should raise their heart rate level to 60 to 80 percent of their maximum heart rate for at least 20 minutes, to achieve a cardiovascular conditioning effect. Training above an 80 percent level gets into the area of diminishing returns and is normally worthwhile only for competitive athletes. A person who is out of shape and just starting a CV conditioning program should work around the 50 or 60 percent level and slowly move up over a number of months. An already fit person would aim at 80 percent.

Your maximum heart rate is the fastest your heart is capable of beating. How do you determine this? One simple method is to use the following formula:

Estimated max heart rate = 208 - (0.7 * age)

For example: if somebody is 40 years old, then according to this formula, the estimated max heart rate is 180 beats per minute (BPM). The CV work out intensity span for this person is between 60 and 80 percent of 180, which is 108 to 144 BPM.

The formula was developed through cardiology research over a wide population range. It tends to be too low for physically fit people, giving a workout zone that is too low and easy.

You can determine your heart rate by taking your pulse, or by using a digital heart rate monitor or a Fitbit. Determining your pulse rate manually is best done with a digital watch or better yet, a digital stopwatch. Timing by watching the sweep hand on an analog watch may be inaccurate. If you're determining your pulse rate at rest, then the longer the time period you measure the more accurate you will be. Thirty seconds is a good time span. You can't measure your pulse while exerting yourself and expect to make an accurate count. To manually check your heart rate during CV exercise you need to take a quick pause in your activity. A break lasting more than 15 seconds will result in your pulse rate slowing too much. The measurement has to be done fast to reflect your true activity level. Here's how to do it: As your workout approaches the 15-minute point, observe a clock closely. When it gets to 5 seconds before the 15-minute mark, stop your activity and press your thumb to your carotid artery. Find your pulse and count 1, 1, 1 and so forth with each beat until you see the time go to the 15-minute point.

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Then start counting pulse beats until you see the clock go to 15 minutes 10 seconds. Multiply that result by 6 to get beats per minute. That's all there is to it. You probably need to do several times to get good at it. Obviously, when you're measuring over 10 seconds and you miscount by 1, then your 60-second projection is off by 6. So do your best to be accurate. With some practice you will become proficient.

Heart rate monitors are electronic devices that give a continuous reading of your heart rate. A basic heart rate monitor costs around \$50 or less. Your training level target rate per minute is your maximum heart rate times a number between 0.6 and 0.8 depending on your current state of physical fitness. Make it 0.6, or maybe a little lower, if you're just starting out and are not used to exertion.

Whatever form(s) of CV exercise you choose, you'll learn to habituate yourself to working at the level that provides the training pulse rate you need. At a minimum, it should be enough to get you lightly panting and sweating. The best way to develop your activity level habit is to check your pulse rate at the 10, 20 and 27-minute points of a 30 minute CV session. At those points you stop, use a digital watch to count what your 10 second pulse rate is, and then immediately resume activity. If you use a heart rate monitor, you can skip these interruptions.

- At the first 10 minute check your rate should be at or only a little below your desired training level.
- At the 20 and 27-minute check, it should be right around the target level.
- The last pulse check is at 27 minutes because you should use the last 3 minutes to train down by slacking off the pace.
- If your pulse rate is too low, increase the intensity next session. If it's too high, ease off a bit.

After a while, you'll get the hang of it and will only need to do the 27-minute pulse check to monitor your workout.

If you are not doing cardiovascular training per se, another option for monitoring your activity would be to use a pedometer. A pedometer needs to be programmed to fit your stride distance, which is usually easy to do. Then you can wear the pedometer on your belt either during your exercise or all day long to measure your total number of steps taken, total distance traveled, and calories consumed with the exercise.

Using a pedometer, a goal of 10,000 steps per day has been promoted by a number of pedometer companies and walking clubs. It probably makes more sense to calibrate your new pedometer, and then just record the number of steps you take for the next 5 days and divide that by 5 to determine what your average number of steps per day is. If you then add to that another 2000 to 3000 steps, you are adding the equivalent of an extra 30 minute walk to your day. That would be a very reasonable new exercise goal. A general classification of pedometer measured activity follows:

- Less than 5000 steps/day Sedentary lifestyle
- 5000 - 7499 steps/day Low active lifestyle
- 7500 - 9999 steps/day Somewhat active lifestyle

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10,000 steps/day Active lifestyle

12,500 or greater steps/day Highly active lifestyle

The actual construction of an exercise program is up to you. Exactly what you do and how you do it depends upon your age, state of health, general physical condition, and current level of physical activity. It's prudent to start off gradually and increase your activity level every few weeks to eventually reach your exercise goal. Whatever you do, create this in a way so as to make it an enjoyable part of your every day activities.

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