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Technology propels police

Fitness questions from campus cops

■ BY MATT BRZYCKI

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In March of 2006, I had the opportunity to speak to the Princeton University Department of Public Safety (the campus police) about fitness. A number of great questions were asked during and after the presentation. What follows are 10 of those questions along with my responses. (In crafting this into the format of an article, I've taken the liberty of including a bit more information than I was able to give at the time.)

Q: Are some people naturally more flexible than others?

A: There are many factors that influence your flexibility – some over which you have little or no control. As people age, for example, they tend to lose flexibility. To a degree, your flexibility is also related to your gender. Some men are more flexible than some women but, in general, women are more flexible than men. In addition, it's important to understand that flexibility is affected by several genetic (or inherited) characteristics such as your percentage of body fat (especially that which is around your mid-section). Your flexibility also has genetic limitations that are structural which include your bones, tendons, ligaments and skin along with the extensibility of your muscles. Finally, previous injury to a muscle or connective tissue may also influence your flexibility.

Q: What's the best activity for aerobic training?

A: The best aerobic activity is the one that you enjoy the most. Your Aerobic System doesn't know if you pedaled on a stationary cycle one day and ran on a motorized treadmill the next. The only thing that really matters is whether or not you applied a meaningful workload to your heart and aerobic pathway.

Keep in mind, though, that each activity has advantages and disadvantages. For instance, swimming is a good activity since it's non-weightbearing; the water supports your bodyweight which virtually eliminates the compressive forces on your bones and joints. But swimming isn't a good activity if you have poor swimming skills. In this case, your heart rate may exceed your recommended training zone in an effort just to keep yourself afloat. And if you're not skilled at swimming, you'll also tire very quickly.

Additionally, some aerobic activities aren't advisable if you're prone to certain injuries or likely to complicate an existing orthopedic condition. For example, running is a good activity but it has a high risk of orthopedic stress and overuse injuries. So, it's not a good idea to run a lot if it bothers your knees or lower back.

In short, the best advice is to select suitable activities that are enjoyable, compatible with your skill levels and orthopedically safe.

Q: Is rope jumping a good aerobic activity?

A: Rope jumping is a good activity as long as you're skilled enough to rope jump. Remember, too, that rope jumping is a high-impact activity that has a greater risk of orthopedic stress and overuse injuries than a low-impact activity. When rope

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jumping, you're essentially a human shock absorber. Thus, rope jumping isn't recommended if you're a larger-than-average person – larger due to either fat tissue or muscle tissue – because of the excessive stress that's placed on your ankles, knees and lower back.

Q: Does rope jumping improve your coordination?

A: Rope jumping will improve your coordination in rope jumping. But rope jumping will not improve your coordination in basketball, softball, ballroom dancing or any other activity except for rope jumping.

Q: Is running in place good for my hips?

A: Running in place will certainly exercise your hips and legs. While this won't do much for improving strength, it's a good aerobic activity – as long as you don't mind running in place and understand that, like rope jumping, it's a high-impact activity.

Q: Should I use different types of aerobic equipment?

A: If you haven't exercised before or haven't done so in a while, you can do the same activity for several months and it will still be fairly novel. But as you become more experienced, you'll likely need more variety in your program to remain enthusiastic about your training. And you can get more variety by using different types of equipment.

Q: Can you do 30 minutes of aerobic training and 30 minutes of strength training in the same workout?

A: There was a study in which 30 subjects were randomly assigned to one of three groups: a group that did strength training, a group that did aerobic training and a group that did strength training and aerobic training. The latter group performed the same protocols as the former two groups but their strength training and aerobic training were done in the same workout. All groups trained three times per week for 10 weeks. At the end of the training period, the subjects who did strength training and aerobic training in the same workout had significant increases in their muscular strength and aerobic fitness. Furthermore, their increases in muscular strength were comparable to the subjects who only did strength training and their increases in aerobic fitness were comparable to the subjects who only did aerobic training.

Q: Is it okay to do aerobic training before strength training?

A: If you perform strength training and aerobic training on the same day, you obviously have two options: You can do strength training before aerobic training or you can do aerobic training before strength training. What's the best sequence?

If your main goal is to increase your muscular strength, then you should do strength training before aerobic training; if your main goal is to increase your aerobic fitness, then you should do aerobic training before strength training.

But what if your main goal is simply to improve your overall fitness? Well, research indicates that better results are obtained when aerobic training is performed before strength training. In one study, subjects did strength training, rested for five minutes and then did aerobic training (pedaling for 20 minutes on a stationary cycle). During a subsequent workout, the same subjects did the same activities but in reverse sequence: They did aerobic training, rested for five minutes and then did strength training. When they did strength training after aerobic training, their strength performance was 1% worse than when they did strength training before aerobic training; when they did aerobic training after strength training, their aerobic performance was 8% worse than when they did aerobic training before strength training. If both activities are to be done in the same workout, then, aerobic training has less of an impact on strength training than strength training has on aerobic training.

Q: Don't free weights work the stabilizers more than machines?

A: With free weights, you have to balance the resistance; with machines, the resistance is already balanced. Having to balance free weights requires a greater involvement of stabilizing muscles. However, it doesn't appear as if this results in a significantly greater response. Numerous studies have shown that there are no significant differences in the development of strength when comparing groups who used free weights and groups who used machines. And even though an exercise done with free weights engages stabilizing muscles while the same exercise done with a machine doesn't, you can always train the stabilizing muscles separately in other exercises.

Q: How can I get rid of the spare tire around my mid-section?

A: The abdominal area probably gets more attention than any other bodypart. Many people perform countless repetitions of sit-ups, knee-ups and other abdominal exercises – sometimes more than once per day – with the belief that this will give them a highly prized set of "washboard abs."

The fact of the matter is that abdominal exercises have little effect on the subcutaneous fat that resides over the abdominal muscles (and below the skin). The reason why you cannot selectively lose fat from an isolated area is that when you exercise, fat (and carbohydrate) stores are drawn from throughout your body as a source of fuel – not just from one specific area. So, you can do sit-ups until you pass out but these efforts will not automatically trim your mid-section.

One study evaluated the effects of a 27-day sit-up program on the fat-cell diameter and body composition of 13 subjects. Over this four-week period, each subject performed a total of 5,004 sit-ups (with the legs bent at a 90-degree angle and no foot support). Fat biopsies from the abdominal, subscapular and gluteal sites revealed that the sit-up program reduced the fat-cell diameter at all three sites to a similar degree. In other words, exercising the abdominal muscles didn't preferentially affect the fat in the abdominal area more than the gluteal or subscapular areas.

You should treat your abdominals just like any other muscle. The abdominals can be targeted effectively in a time-efficient manner by training them to the point of muscular fatigue within about 10 - 12 repetitions (or about 60 - 70 seconds).

Matt Brzycki is the coordinator of Recreational Fitness and Wellness at Princeton University. A former Marine Drill Instructor, he has authored, co-authored or edited 15 books on strength and fitness, including SWAT Fitness (available at www.operationaltactics.org).