

**SPORTS CARDIOLOGY
PART I**

Exercise & the Heart ...

a time to reflect on the huge benefits and small risks.

As a heart specialist with a research interest in athletes' heart, 2007 highlighted the paradox of the relationship between sport and health. Every well conducted research project comes up with the same clear message – moderate exercise saves lives! Yet, the death of an athlete creates major headlines and distorts the fact that the sudden death of a young athlete is a very rare event.

The recent death of Ryan Shay in the US Olympic Trials Marathon demonstrates how nothing can be more unexpected or tragic. As a former US half and full marathon champion, Ryan had proven that he had the cardiovascular make-up of a champion. His death remains unexplained. Also in the US, the deaths of Chad Schieber, Matthew Hardy and Dorothy Barnett-Griffin all occurred during, or soon after, marathon or Ironman triathlon racing. In South Africa, two well performed athletes – Michael Gordon and Willem Malapi – died after struggling across the finish line in the Comrades Marathon. These events, once confined to regional newspapers, are now shared across web-based media sources – reaching a far greater audience. With increased frequency we hear of these tragedies but this does not necessarily reflect an increasing incidence. It is important to remember that sudden death occurs very rarely – approximately 1 in 200,000⁽¹⁾ young athletes per year. This equates to 1 in 1,500,000 bouts of exercise!⁽²⁾

To understand the social context of the strug-

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gle and to grapple with the pros and cons of endurance exercise one should first appreciate history. Pheidippides got the marathon off to an inauspicious start when, in ancient Greece he ran some 250km in two days to enlist the Spartan's support against the invading Persians. Athens was saved. After then running 35km from Marathon to declare victory, Pheidippides suddenly collapsed and died. This cautionary tale pervaded appreciation of endurance sport for centuries. Early 20th century marathon competitors were considered reckless renegades. Even in the 1950's Roger Bannister was studied intensely whilst preparing to break the 4 minute mile. It was thought that such a feat was beyond human physiology and pushing the heart to such limits was a significant risk. Competition in many schools was limited to 880 yards for fear of longer distances having severe consequences. It was not until the early 1970's, due in large part to the Olympic victory of Frank Shorter, that distance running gained mainstream acceptance and its popularity grew dramatically. The jogging craze that ensued also provoked a frenzy of medical research assessing whether regular exercise should be encouraged as part of a healthy lifestyle.

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Does regular exercise prevent heart attacks and death?

Yes. Numerous large studies have assessed physical activity and health outcomes and demonstrated that the risk of heart attack is reduced. For example, the Harvard Alumni Health Study⁽³⁾ assessed over 12,000 middle aged men and found that the rate of heart disease was reduced with increasing amounts of leisure time activity. In a larger study of nearly 44,500 men, jogging at least 1 hour per week reduced the chance of developing heart disease by a massive 42%⁽⁴⁾. The results for women are virtually identical⁽⁵⁾. Not only does exercise prevent heart disease, it decreases your chance of dying from any cause⁽⁶⁾.

**What is heart disease?
How can you prevent it?**

Heart disease refers to symptoms of chest pain or a sudden heart attack caused by the build-up of cholesterol plaques in the heart arteries. Traditional risk factors include smoking, high cholesterol, high blood pressure, diabetes and a family history of heart disease at a young age. Exercise does not make you immune from the dangers of these. Runners with high blood pressure or high cholesterol should be treated in the same manner as those less active. However, exercise has two major benefits – it reduces the risk of heart disease independently of other risk factors »

» and it is a very good treatment for the risk factors themselves. Exercise increases "good cholesterol" and, hence, has a beneficial effect even if total cholesterol is not greatly affected. Blood pressure can be significantly reduced in those with high blood pressure simply by jogging for 30 minutes 2-3 times per week. Exercise also aids in the treatment and, possible prevention of diabetes. It can also greatly increase chances of smoking cessation. In short, if exercise were able to be marketed as a pill it would be the biggest "invention" in the history of medicine. Its ability to prevent and modify disease surpasses anything else that we hear about on "breakthrough" news flashes.

Other benefits of exercise

Living in the age of the obesity epidemic, it is easy to be critical of the numerous advertisements on TV for crash diets. I believe that attempts at weight loss without the emphasis on exercise

are futile. Research suggests that weight loss is achievable with exercise alone⁽⁷⁾ and best achieved with a combination of exercise and diet⁽⁸⁾. Exercise provides some protection against breast⁽⁹⁾ and prostate⁽¹⁰⁾ cancer. It has also been shown to reduce stress, anxiety and depression⁽¹¹⁾. In monetary terms, it has been estimated that physically active people cost the health system around \$400 less per year (you may wish to ask your health insurance company for a more substantial rebate!).

This is probably all starting to sound like a big advertisement for exercise. I make no apology for this. The benefits of moderate exercise are profound and proven. It is important to remember these things when we are confronted with the tragedy of a young athlete dying. Statistically, it is much better to exercise. The millions of inactive people who die each day from heart disease do not make headlines and so our perspective is heavily biased by media coverage.

Limitations in exercise research

By far the biggest limitation of all of the research described above is that what is described as moderate or vigorous exercise in the medical literature is what many of the readers of this magazine will consider a warm-up – if that. Most studies that have evaluated the ideal amount and intensity of exercise have shown "more is better". But the most exercise assessed is the equivalent of a gentle jog for 45 minutes per day. This falls a long way short of the training regimes of competitive runners let alone cyclists and triathletes. We do not know if these benefits are sustained. Do competitive athletes have the lowest risk of all? Or are there new risks associated with such intense training? These are extremely important questions for which we do not have complete answers.

In subsequent editions, I will explain the most common causes of why young athletes might suddenly die – remembering that they are all rare. I will discuss what warning signs to be aware of and how to ensure that you are not affected. I will also discuss the changes in the heart that result from exercise training and whether this may have some associated risks. »

REFERENCES:

1. Corrado D et al. Does sports activity enhance the risk of sudden death in adolescents and young adults? J Am Coll Cardiol. Dec 3 2003;42(11):1959-1963.
2. Albert CM et al. Triggering of sudden death from cardiac causes by vigorous exertion. N Engl J Med. Nov 9 2000;343(19):1355-1361.
3. Sesso HD et al. Physical activity and coronary heart disease in men: The Harvard Alumni Health Study. Circulation. Aug 29 2000;102(9):975-980.
4. Tanasescu M et al. Exercise type and intensity in relation to coronary heart disease in men. Jama. Oct 23-30 2002;288(16):1994-2000.
5. Manson JE et al. A prospective study of walking as compared with vigorous exercise in the prevention of coronary heart disease in women. N Engl J Med. Aug 26 1999;341(9):650-658.
6. Paffenbarger RS et al. The association of changes in physical-activity level and other lifestyle characteristics with mortality among men. N Engl J Med. Feb 25 1993;328(8):538-545.
7. Irwin ML et al. Effect of exercise on total and intra-abdominal body fat in postmenopausal women: a randomized controlled trial. Jama. Jan 15 2003;289(3):323-330.
8. Kraemer WJ et al. Influence of exercise training on physiological and performance changes with weight loss in men. Med Sci Sports Exerc. Sep 1999;31(9):1320-1329.
9. McTiernan A et al. Recreational physical activity and the risk of breast cancer in postmenopausal women: the Women's Health Initiative Cohort Study. Jama. Sep 10 2003;290(10):1331-1336.
10. Michaud DS et al. Physical activity, obesity, height, and the risk of pancreatic cancer. Jama. Aug 22-29 2001;286(8):921-929.
11. Blumenthal JA et al. Effects of exercise training on older patients with major depression. Arch Intern Med. Oct 25 1999;159(19):2349-2356.

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