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Health Tips

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In this Issue

Page

Run for Your Health 1

Data Brief 7

News Bites 8

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Run for Your Health

Running, including jogging, is a popular recreational and sport activity around the world. One reason for its popularity may be that no exercise equipment is needed other than a good pair of running shoes. Moreover, a person can choose to run indoors or outdoors, and at any time of the day. Thus, millions of casual runners and joggers, treadmill users, professional and elite racers run for leisure, for health and for competition each day all over the world. In Hong Kong, running is also one of the most popular sport activities. A survey conducted by the Leisure and Cultural Services Department in 2012 showed that running / jogging was the second most frequently participated sport activities among young adults (36.9%) and the middle-aged (26.8%) (Figure 1).¹

Health Benefits of Running

Physical activities, regardless of type, offer a number of health benefits. It lowers blood pressure, increases insulin sensitivity, improves lipid profiles, enriches bone density, and enhances psychological well-being. Physical activities also lower the risk of developing a range of chronic diseases: obesity, cardiovascular diseases, type 2 diabetes, colon cancer, female breast cancer, and depression.²⁻⁴ These health benefits are more pronounced with increasing amounts of physical activities, which in turn depend on their frequency, duration, and intensity. In addition, studies have shown that doing vigorous-intensity physical activities resulted in a lower cardiovascular and all-cause mortality than moderate-intensity physical activities:

Figure 1: Frequently participated sport activities among persons aged 20 – 69: young adults, the middle-aged, and the elderly



Source: Leisure and Cultural Services Department, 2012.

for every 1 MET increase in exercise capacity, there is about 8% - 17% lower risk of dying from cardiovascular diseases and from any cause⁵ (intensity of physical activities is measured in terms of metabolic equivalent (MET) - a unit to indicate the rate at which the body uses oxygen or energy during physical activity).

Running is an aerobic vigorous-intensity physical activity that requires 6.0 or more METs (Table 1).⁶ Studies have shown that running improves blood lipid profiles and lowers the risk of developing cardiovascular diseases, suffering from disability and dying.⁷⁻¹² Compared to walkers and non-runners, runners had significantly lower serum levels of total cholesterol, lower 'bad' low-density-lipoprotein cholesterol and triglycerides, but a higher serum level of 'good' high-density-

lipoprotein cholesterol.⁷⁻⁹ Men who ran at a pace of 6 or more miles per hour (mph) for an hour or more a week would have 42% lower risk of developing cardiovascular diseases compared to those men who did not run.¹⁰ A longitudinal study that followed 284 running club members and 156 healthy controls in the United States (U.S.) for 21 years observed that older runners aged 50 and above who participated in long-term running (and other vigorous exercise) had less disability and lower mortality in later life than their counterparts who had never been a runner.¹¹ Another prospective study of over 8 400 healthy men aged 20 - 98 with a follow-up period of up to 35 years also found that joggers had 22% lower risk of dying (from any cause), and on average lived 2.6 years longer than non-joggers after adjusting for a number of socio-demographic, lifestyle and health factors.¹²

Table 1: Estimated energy expenditure of running at different speeds⁶

| | Number of METs* |
|--|-----------------|
| Jogging: | |
| Jogging, in general | 7.0 |
| Jogging, in place | 8.0 |
| Running at different speeds: | |
| 4 miles per hour (mph) (15 min/mile) | 6.0 |
| 5 mph (12 min/mile) | 8.3 |
| 6 mph (10 min/mile) | 9.8 |
| 7 mph (8.5 min/mile) | 11.0 |
| 8 mph (7.5 min/mile) | 11.8 |
| 9 mph (6.5 min/mile) | 12.8 |
| 10 mph (6 min/mile) | 14.5 |
| 12 mph (5 min/mile) | 19.0 |
| 14 mph (4.3 min/mile) | 23.0 |
| Other types of running: | |
| On a track, team practice | 10.0 |
| Marathon | 13.3 |
| Upstairs | 15.0 |
| Walking (for reference) | |
| 2.8 to 3.2 mph, level, firm surface, moderate pace | 3.5 |

Note: * One MET corresponds to an oxygen consumption of 3.5 mL/minute per kilogram of body weight or an energy expenditure of 1 kcal/hour per kilogram of body weight, and is roughly equivalent to the resting metabolic rate during quiet sitting. The harder the body works during any given activity, the more oxygen is consumed (and the more energy is expended), and the higher the MET level.

Source: Ainsworth et al, 2011.

Running can also be regarded as a weight-bearing exercise, a type of exercise that works the muscles and bones against gravity. Running strengthens muscles in the legs and the buttocks, boosts up bone mass and guards against osteoporosis. Being a vigorous-intensity physical activity, running is renowned for its calorie-burning effect too. For a person weighing 70 kilograms, running at a pace of 5 mph (8.3 METs) for half an hour can burn approximately 290 kilocalories – that is more than double the amount of energy burnt by walking at a moderate pace of 2.8 to 3.2 mph (3.5 METs) for the same duration (122 kilocalories). Besides, running can bring about many psychological benefits. It is an effective way to release pent-up stress, anger and aggression, and can help the runner sleep better at night. Most people report feeling good and mentally relaxed after running. This is due to the release of the ‘feel good’ hormone, called endorphins. Human laboratory studies showed that a 20-minute bout of running or jogging at a self-selected pace would be sufficient to substantially decrease mood disturbance.¹³

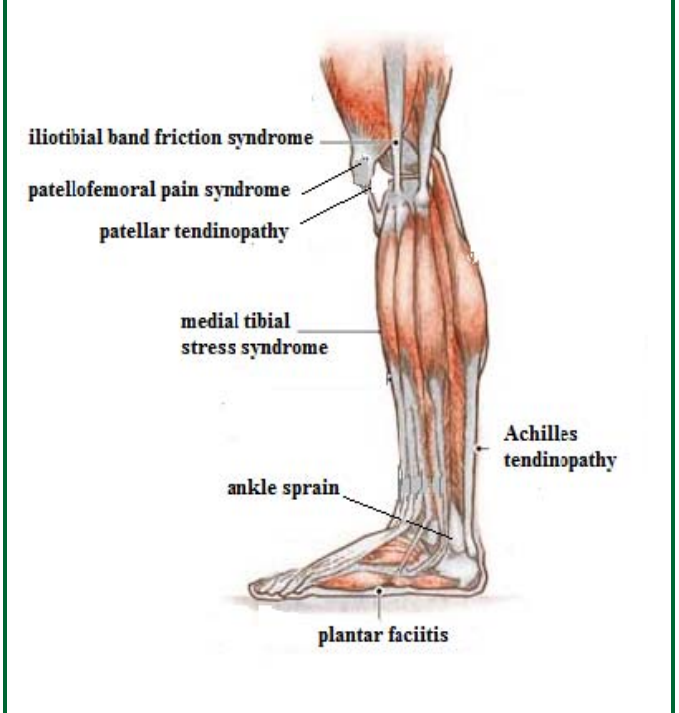
Running-related Injuries

Running is one of the most strenuous forms of physical activities, and as with all forms of vigorous-intensity physical activities, it can cause injuries despite its many health benefits. Epidemiological studies have estimated that up to 70% of recreational and competitive runners sustain overuse musculoskeletal injuries, especially to the lower extremities, during any 1-year period.¹⁴ Among long-distance runners, the incidence of lower extremity running injuries ranged from 19.4% to 79.3%.¹⁵

Common running-related musculoskeletal injuries include iliotibial band friction syndrome, patellofemoral pain syndrome (commonly known as runner’s knee), patellar tendinopathy, medial tibial stress syndrome (shin splints), Achilles tendino

pathy, sprained ankles and plantar fasciitis (presented with heel pain) (Figure 2).^{16,17} These are usually the results of overuse and training errors, such as running too much / too often, going too fast / too soon, having too little rest, or paying too little attention to symptoms of injury such as pain.^{14,18} Running injuries can also be attributed to worn-out and poor fitting footwear (such as sole excessively worn and lack of appropriate heel padding); poor running postures and techniques (such as over-striding, bouncing up and down too much, and landing heavily on foot); and running on hard, uneven surfaces for extended periods. Other factors such as unequal leg lengths and flat-feet may also make runners more prone to injuries. In hot weather, runners and joggers may also experience dehydration, electrolyte imbalance, heat stroke and other heat-related illness if water and electrolyte intake is inadequate to compensate for the losses.¹⁹

Figure 2: Common running-related musculo-skeletal injuries



With the growing popularity of marathon in Hong Kong and increasing media reports of runners collapsing and even dying on race courses, there is concern about the safety of marathon races. Vigorous exercise, including running, is a potential trigger for acute cardiovascular events in susceptible persons. For running, susceptible persons include those with pre-existing cardio-vascular diseases, which may or may not be known to the runner; and those novice and 'sudden' runners who have not received sufficient training and do not possess the basic fitness for competitive sports.^{20,21} However, despite making headlines, sudden cardiac deaths associated with marathon races are in fact exceedingly rare events.²⁰ A U.S. study assessed the incidence and outcomes of cardiac arrest among 10.9 million marathon and half-marathon runners between 2000 and 2010. It revealed that the incidence rate of cardiac arrest during marathon races was 1 in 184 000 runners and that of sudden death was 1 in 259 000 runners. Cardiovascular diseases, including hypertrophic cardiomyopathy and atherosclerotic coronary heart disease, was by far the most common causes for the cardiac arrest.²²

Getting Started for Safe Running

Running is generally safe for most people, and its long-term health benefits far outweigh the potential risks.^{20,23} Besides, the risk of injury associated with running can significantly be reduced by adopting prudent behaviours, gradually working up to the desired level of activity and avoiding excessive amounts of activity. When running outdoors, runners also need to be aware of environmental conditions such as the weather, levels of air pollution, and road hazards. To reap the benefits of running, always take the necessary safety precautions each time you set out on a run. Here are some general safety tips and health suggestions that can help reduce the risk of injuries and other adverse health effects associated with running^{19,24,25}:

- ◇ **Consult a doctor for a medical check-up** before starting a running or any vigorous-intensity physical activity programmes. Those who are overweight, obese, or have chronic medical conditions (such as heart disease, high blood pressure, asthma, diabetes mellitus or arthritis), or have not been exercising for a long time, are urged to do so in particular. Running is a high-intensity physical activity with lots of impact on the joints. Doctors may advise overweight or obese people to try walking, cycling, swimming or water aerobics as a start and only start running after losing weight.
- ◇ **Use proper running gear.** Choose a pair of running shoes that is best suited for your feet and running style. Running socks can also help reduce the risk of blisters on feet. Dress in appropriate clothing based on the weather conditions and the time of day. If running at night, make sure you are visible by wearing bright or reflective clothes.
- ◇ **Learn and use proper running techniques.** It can help reduce your risk of injury, make your runs feel less tiring and more enjoyable. For example, lean forward a bit while running; keep your head straight and have your eyes focused to a point on the ground that is about 40-50 metres ahead of you; do not hunch your shoulders and keep them parallel to the ground; keep your arms bent at a 90-degree angle and your hands relaxed; avoid lifting your knees too high; land on the middle of your foot; do not strike the ground heavily and minimize the up and down "bouncing" with each stride; and breathe deeply and rhythmically. You may consider getting advice from a running coach, sport physician or physiotherapist.
- ◇ **Warming up and cooling down properly to reduce the risk of injury.** Before running, always warm up gently for about 10 minutes with some light aerobic exercises (such as

stair stepping on regular stairs, rope jumping and brisk walking) to slightly increase the heart rate / core temperature and make the muscles more flexible followed by dynamic stretching (such as swinging both arms in a complete overhead rotation; swinging legs backward and forward; and doing foot circles and high knee skips) to enhance the elasticity and flexibility of muscles and joints. Also make sure to allow for about 10 minutes “cooling down” period with light jog, walking and static stretching (such as hamstring stretch; hip and thigh stretch; and iliotibial band stretch) afterwards to slowly return the body to normal or resting state and prevent post-running muscle soreness.

◇ **Begin slowly and gradually increase the distance, speed and duration of running.**

Runners are most vulnerable to injuries during the initial 4 to 6 months of running, upon returning to running after an injury, and when the running distance or speed is increased. So **avoid overdoing** by observing the “10% rule”, i.e. no more than 10% increase in the total distance of running per week and back off by 10% every third or fourth week of training to give body adequate time to adjust. Runners should also monitor for any adverse effects following such increase, and downward adjustments should be made if not well tolerated.²⁶

◇ **Ensure adequate rest**, and always listen to the body to learn how much increase in stress the body can handle.

◇ **Do not run with an empty stomach, or immediately after a full meal.**

◇ **Do not drink alcohol before, during and after running** because it may increase the risk of injury, causing dehydration and poor exercise performance. Also, **avoid drinking beverages containing caffeine** if you have experienced any negative side effects of caffeine

before. **Replenish extra fluids** before, during, and after running, especially in hot weather to compensate for the losses.

◇ **Avoid running outdoors during extremely hot and cold temperatures, or when the air pollution levels are high.** In summer, choose to run during the early morning or evening. Take preventive measures to guard against insect bites and minimize the risk of vector-borne infectious diseases, such as by using insect repellent.

◇ **Avoid running on sandy, asphalt or other hard surfaces.** Choose a safe route with flat and reasonably soft surfaces. If possible, use running tracks and sport grounds that have been developed specifically for jogging and running. To locate a running / jogging track close to your home or workplace, please visit the website of Leisure and Cultural Services Department at <http://www.lcsd.gov.hk/lsb/en/districts.php?ftid=26>.

◇ **Always stay alert while running.** Run in well-lit areas to avoid accidents such as stepping into a pothole. Avoid wearing headphones when running on the street as that will compromise your awareness of approaching cars or other warnings.

◇ **Run with a buddy.** Joining a running group or club can get the support of the wider running community, quality advice on running, and benefit from safety in numbers.

◇ **Do not run when you are unwell, overtly tired or in any way injured.** Stop running if there is dizziness, chest pain, nausea or vomiting, severe muscle or joint pain. See your doctor promptly for diagnosis and treatment.

It is also noteworthy that long-distance running requires patience and perseverance and the decision to run a marathon is not something to be taken lightly. In fact, serious marathon runners traverse an incredible number of disciplined miles for this event, and practise on different types of terrain in order to develop their endurance, strength and speed. Thus, recreational and novice runners should not expect to start running today and be able to complete a 10-kilometre race in 3 months. It is important for beginners to have realistic targets, and to start with a slow course and follow a graded training plan to build up fitness and endurance. It would be wise to check with your family doctor and have a check-up to make sure you are in sound muscular and cardiovascular shape before beginning a long-distance running programme.

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Data Brief

Adequate levels of physical activity can improve cardiorespiratory and muscular fitness, enhance bone health, and reduce the risk of non-communicable diseases such as cardiovascular diseases, diabetes, colon and breast cancer, and depression. The World Health Organization (WHO) recommends that throughout the week healthy adults aged 18-64 should do at least 150 minutes of moderate-intensity aerobic physical activity (such as brisk walking), or at least 75 minutes of vigorous-intensity aerobic physical activity (such as jogging and running), or an equivalent combination of both. In addition, muscle-strengthening activities involving major muscle groups should be done on 2 or more days a week.

A local survey that telephone-interviewed over 2 000 community-dwelling people aged 18-64 in Hong Kong in 2012 found that only less than two-fifths (39.5%) of respondents had met the WHO's aerobic physical activity recommendation in the seven days before enumeration. The Department of Health will continue to work with stakeholders from various government departments and different sectors to promote physical activity participation and improve the environment of communities, so that people can more easily fit physical activity into their lives.

Proportion of community-dwelling people aged 18-64 meeting the WHO's aerobic physical activity recommendation in the seven days before enumeration by sex and age group

| | Proportion |
|------------------|------------|
| Sex | |
| Male | 46.8% |
| Female | 33.4% |
| Age group | |
| 18-24 | 57.9% |
| 25-34 | 35.1% |
| 35-44 | 37.2% |
| 45-54 | 36.1% |
| 55-64 | 39.8% |
| Total | 39.5% |

Source: Behavioural Risk Factor Survey, April 2012.



News Bites

A study reported that practicing Tai Chi, like walking and jogging, is associated with reduced mortality.

The study assessed the associations of regular exercise and specifically participation in Tai Chi, walking, and jogging with mortality among 61 477 Chinese men in the Shanghai Men's Health Study (2002-2009). Information on exercise habit was obtained at baseline using a validated physical activity questionnaire. Deaths were ascertained through biennial home visits and linkage with a vital statistics registry. During a mean follow-up of 5.48 years, 2 421 deaths were identified. After adjustment for confounding factors, men who exercised regularly had a 20% reduced risk of total mortality compared with men who did not exercise. Practicing Tai Chi, walking and jogging was associated with a 20%, 23% and 27% reduced risk of mortality respectively.

There are different types of exercise, and each type brings different health benefits. While some types of exercise improve flexibility and balance (such as Tai Chi and yoga), others use the large muscles to build heart strength (such as jogging and rope-jumping) or increase endurance (such as brisk walking and climbing stairs). Ideally, people should incorporate different types of exercises that they enjoy into their daily life for optimal health benefits.

[Source: Wang N, Zhang X, Xiang YB, et al. Associations of Tai Chi, walking, and jogging with mortality in Chinese men. *Am J Epidemiol* 2013; Jun 27]

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Non-Communicable Diseases (NCD) WATCH is dedicated to promote public's awareness of and disseminate health information about non-communicable diseases and related issues, and the importance of their prevention and control. It is also an indication of our commitments in responsive risk communication and to address the growing non-communicable disease threats to the health of our community.

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