



World Physical Therapy Day, clinical area sheet 2

## Cardiovascular disease

Cardiovascular disease is the term used to describe diseases affecting the heart and circulatory system, and includes heart disease, stroke and raised blood pressure (hypertension).

Exercise, particularly aerobic conditioning and strength training, is one of the key interventions that can prevent death and disability from cardiovascular disease. Physical therapists are experts in prescribing these as part of a structured, safe and effective programme.

For those already affected by cardiovascular disease, the expert advice provided by physical therapists can help bring a return to usual roles. Physical therapists help people achieve a return to work, education, community participation and fulfilled lives.

### Cardiovascular general

Cardiovascular disease is now the leading cause of deaths worldwide. Globally, 17.5 million people died from cardiovascular disease in 2005, 30% of all deaths. 7.6 million were due to coronary heart disease and 5.7 million due to stroke. It is estimated that by 2015 almost 20 million people will die from cardiovascular diseases (mainly heart disease and stroke).

Source: World Health Organization [http://www.who.int/cardiovascular\\_diseases/en/](http://www.who.int/cardiovascular_diseases/en/)

The death and disability rates caused by heart disease and stroke for every country are available at:

[www.who.int/entity/cardiovascular\\_diseases/en/cvd\\_atlas\\_29\\_world\\_data\\_table.pdf](http://www.who.int/entity/cardiovascular_diseases/en/cvd_atlas_29_world_data_table.pdf)

It has been estimated that if everyone walked briskly at 4.8-6.4 kph (3-4 mph) on most days of the week, about 30% of deaths from cardiovascular disease would be prevented each year.

Sources: Pate R et al. *Physical activity and public health*. JAMA. 1995;273(5):402-407.

<http://www.ncbi.nlm.nih.gov/pubmed/7823386>

Wei M, Kampert et al. *Relationship between low cardiorespiratory fitness and mortality in normal-weight, overweight, and obese men*. JAMA. 1999;282(16):1547-1553.

<http://www.ncbi.nlm.nih.gov/pubmed/10546694>

Manson JE et al. *A prospective study of walking as compared with vigorous exercise in the prevention of coronary heart disease in women*. NEJM. 1999;341(9):650-658.

<http://content.nejm.org/cgi/content/abstract/347/10/716>

Tully M et al. *Brisk walking, fitness, and cardiovascular risk: a randomized controlled trial in primary care*. Prevent Med. 2005;41:622-628. <http://www.ncbi.nlm.nih.gov/pubmed/15917061>

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The World Confederation for Physical Therapy (WCPT) represents the physical therapy profession worldwide. WCPT is registered in the UK as a charity.

Research involving people at risk of cardiovascular disease has indicated that exercise supervised by physical therapists, along with counselling from a dietician, brings significant improvements in blood pressure, weight, quality of life and other health indicators after one year.

Source: Eriksson KM, Westborg CJ, Eliasson MC. *A randomized trial of lifestyle intervention in primary healthcare for the modification of cardiovascular risk factors. Scand J Public Health.* 2006;34(5):453-61. <http://www.ncbi.nlm.nih.gov/pubmed/16990155>

## **Raised blood pressure**

Raised blood pressure, which is a risk factor for heart attack and stroke, can be controlled by exercise. One study has indicated that endurance exercise brings an average reduction of 10mm Hg for both systolic and diastolic blood pressure readings.

Source: American College of Sports Medicine's *Guidelines for Exercise Testing and Prescription*. 6th Ed. Baltimore MD: Lippincott Williams & Wilkins 2000.  
<http://www.exrx.net/Store/Other/ACSMGuidelinesExTestingRx.html>

The type of strength training prescribed by physical therapists can effectively reduce blood pressure in older men and women.

Source: Martel GF et al. *Strength training normalizes resting blood pressure in 65- to 73-year-old men and women with high normal blood pressure. J Am Geriatr Soc.* 1999 Oct;47(10):1215-21. <http://www.ncbi.nlm.nih.gov/pubmed/10522955>

Major analyses of available research have indicated that exercise can reduce resting blood pressure by 3 mm Hg for resting systolic blood pressure.

Sources: Cornelissen VA, Fagard RH. *Effects of endurance training on blood pressure, blood pressure-regulating mechanisms, and cardiovascular risk factors. Hypertension* 2005 Oct; 46(4):667-75. <http://www.ncbi.nlm.nih.gov/pubmed/16157788>  
Kelley GA, Kelley KS. *Progressive resistance exercise and resting blood pressure: a meta-analysis of randomized controlled trials. Hypertension.* 2000 Mar; 35(3):838-43.  
<http://www.ncbi.nlm.nih.gov/pubmed/10720604>

This type of blood pressure reduction has been associated with a 5-9% reduction in heart morbidity, and a 8% to 14% reduction in the risk of stroke.

Source: Whelton et al. *Primary prevention of hypertension: clinical and public health advisory from The National High Blood Pressure Education Program. JAMA.* 2002 Oct 16;288(15):1882-8. <http://www.ncbi.nlm.nih.gov/pubmed/12377087>

## **Stroke**

Exercise reduces the risk of stroke. Walking at 4.8 kph (3 mph) for 5 hrs/wk brings a 46% lower risk of stroke, compared with non-exercisers.

Sources: Hu F et al. *Physical activity and risk of stroke in women. JAMA.* 2000; 283(22):2961-2967. <http://www.ncbi.nlm.nih.gov/pubmed/10865274>  
Lee I et al. *Exercise and risk of stroke in male physicians. Stroke.* 1999;30(1):1-6.  
<http://www.ncbi.nlm.nih.gov/pubmed/9880379>

Structured exercise also brings improvement in all measures of impairment and disability in people who have had a stroke.

Source: Teixeira-Salmela et al. *Muscle strengthening and physical conditioning to reduce impairment and disability in chronic stroke survivors*. *Arch Phys Med Rehabil*. 1999 Oct; 80(10):1211-8. <http://www.ncbi.nlm.nih.gov/pubmed/10527076>

In one study, patients who had had a stroke performed strengthening and functional tasks three times a week for four weeks, and gained significant improvements in strength, walking speed, standing/sitting and endurance.

Source: Dean CM et al. *Task-related circuit training improves performance of locomotor tasks in chronic stroke: a randomized, controlled pilot trial*. *Arch Phys Med Rehabil*. 2000 Apr;81(4):409-17. <http://www.ncbi.nlm.nih.gov/pubmed/10768528>

## Heart disease

Systematic reviews of evidence have shown that therapeutic exercise provided by physical therapists is beneficial to people with coronary heart disease, heart failure and chronic obstructive pulmonary disease.

Source: Taylor, NF et al. *Therapeutic exercise in physiotherapy practice is beneficial: a summary of systematic reviews 2002–2005*. *Australian Journal of Physiotherapy*. 2007, Vol 53(1): 7-15. <http://www.ncbi.nlm.nih.gov/pubmed/17326734>

Reviews of evidence have shown that exercise-based cardiac rehabilitation for patients with coronary heart disease significantly improves health outcomes and mortality rates.

Sources: Clark et al. *Meta-analysis: secondary prevention programs for patients with coronary artery disease*. *Ann Intern Med*. 2005; 143:659-672.

<http://www.annals.org/cgi/content/abstract/143/9/659>

Taylor RS et al. *Exercise-based rehabilitation for patients with coronary heart disease: systematic review and meta-analysis of randomized controlled trials*. *Am J Med*. 2004; 116:682– 692. <http://www.ncbi.nlm.nih.gov/pubmed/15121495>

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