Exercise and Obesity: Evidence-based Best Practice - the Good and Bad News

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Having gained his double-major BSc (Physiology & Biochemistry) and BPhEd at Otago University, Duncan Macfarlane was a Commonwealth Scholar at University College, Oxford, where he obtained his DPhil in respiratory physiology. In 1986 he began work as a lecturer in Exercise Physiology in joint position at the School of Physical Education and Department of Physiology, University of Otago. In 1994 he accepted a post at The University of Hong Kong, which has evolved into his current lecturing position as an exercise physiologist within the Institute of Human Performance (IHP).

His main research focus has been on monitoring activity patterns and developing interventions aimed at increasing levels of habitual physical activity in both young and elderly people, with his early work showing that Hong Kong children are some of the most inactive in the world. His most recent work has been a part of the URC Public Health strategic initiative to look at how the built environment in Hong Kong affects levels of habitual activity and its obesogenic role.

He is Hong Kong's only Level III ISAK accredited anthropometrist, a Level III accredited Exercise Physiologist, and Head of the Stanley Ho Exercise and Sports Science Laboratory at the IHP.

Obesity prevalence has been increasing rapidly in nearly all nations, to the extent it is considered a global epidemic. In the USA the obesity prevalence rates (BMI>30) have doubled between 1986 and 2000, whilst severe (>40) and super obesity (>50) have increased 4-to-5 fold, along with alarming increases in childhood overweight/obesity. It has been estimated that 70-75% of the USA will be overweight/obese by 2010 and although Hong Kong has not yet reached such epidemic levels, it is certainly not immune from these trends. A large number of factors influence our levels of adiposity and their interactions should be considered when attempting to deal with this problem.

As adiposity is primarily a balance between energy intake and energy output, then dietary restriction and regular physical exercise have been intuitively accepted as vital in a successful weight management program. Although many short-term programs (<6 months) appear successful, the long term success of most weight management programs has been poor, with only 30% successfully maintaining a loss >10% of body weight for over 5 years. A recent NIH panel concluded that the combination of reduced calorie diet and increased physical exercise produces greater weight loss than diet alone or exercise alone; whilst the addition of behaviour therapy (such as Problem Solving Therapy), peer support, and regular contact with a therapist can produce additional benefits. The National Weight Control Registry note that a significant lifestyle incident or triggering event is often necessary to precede successful weight loss, which suggests potential benefits of a more proactive initiating role is needed by family physicians/clinicians.

Evidence shows that weight reduction programs based purely on increasing levels of physical activity are not very successful (loss of ~0.3 to 1.3kg over 16 weeks), as the typically mild-moderate activities do not last long enough to consume a significant amount of energy. Thus it has been estimated it could take 2 years for a sedentary obese person to treat their condition through exercise alone. However, exercise is an important adjunct to dietary restriction, and can play a more important role in the prevention of weight gain (walking only an extra 400-1600 metres per day). Continuous/aerobic exercise is better than intermittent/anaerobic, and although the highest fat oxidation rate is at 65%VO2max/75%HRmax (moderate/hard), a higher intensity

burns more calories and fat in exercise and recovery. Strength training is also a popular adjunct, appearing to have a scientific basis, but a recent review concluded that insufficient evidence exists to support a significant role in weight management. Some research suggests a switch of focus from weight loss to that of "metabolic fitness" in order to improve health risk, as this can improve independent of a reduction in weight via a standard exercise program.

Evidence also suggests that a greater rate of initial weight loss is positively associated with enhanced long-term (5 year) weight loss. In terms of exercise prescription, although the CDC currently suggest we accumulate 150 minutes/week of moderate activity for the maintenance of our health, the Institute of Medicine recommends 60 minutes/day for the control of body weight, and even more (75 minutes/day) has been shown to be better for long term weight loss. Whether such levels are realistically achievable in Hong Kong's unique environment is yet unknown and remains a challenge for health professionals.