

Chapter 10

Recommendations

Recommendations for research

Critically evaluate existing and new methods for assessment of body composition, physical activity and diet.

- *Physical activity:* Develop standardized, validated methods to assess physical activity that will capture different dimensions of activity, such as duration, frequency and intensity, to allow comparisons between epidemiological and population studies.
- *Body composition:* Develop standardized, validated methods to measure body composition and evaluate the need for ethnic-specific and age-specific BMI and waist cut-points.
- *Diet:* develop methods to assess aspects of dietary habits that influence weight gain. This includes development of biomarkers and questionnaires that capture aspects such as macronutrient composition, energy density, glycaemic index, dietary patterns, palatability and portion sizes.

Maintain and enhance systems for monitoring trends in body composition and physical activity in various populations

- Develop national surveillance programmes that allow global monitoring of indicators of body composition and physical activity in men and women.
- Develop methods to study environmental factors (physical, economic and socio-cultural) that determine behaviour in populations undergoing various stages of economic development.
- Develop strategies for using data from population monitoring to evaluate potential changes in physical activity and dietary patterns resulting from interventions and policy initiatives.

Conduct observational epidemiological studies using improved and standardized measures of physical activity and indicators of body composition and fat distribution in diverse populations (by age, sex and ethnicity) of sufficient sample size to assess cancer risk

- Study the relationship between different indicators of body composition and fat distribution and cancer risk.
- Study the relationship between physical activity patterns and cancer risk.
- Study the interactions between physical activity and dietary habits and body composition in relation to cancer risk.
- Study the interactions between genetic variation and physical activity patterns in relation to weight gain and body composition.
- Study the effect of voluntary weight reduction on cancer risk in overweight and obese individuals in different subgroups of sex and age.
- Establish the association between putative cancer biomarkers with cancer risk. The link between a biomarker and cancer should be firmly established before testing intervention effects on the biomarkers.

Conduct long-term clinical intervention studies in subgroups of age, sex and ethnicity to alter behavioural patterns (dietary and physical activity) which may influence weight gain. Specific circumstances of high risk for weight gain (such as smoking cessation and pregnancy) should be addressed in interventions.

- Conduct long-term (more than one year) intervention studies on dietary modification (e.g., changing macronutrient composition, energy density, glycaemic index, dietary patterns, palatability and portion sizes) in relation to weight gain.
- Conduct long-term (more than one year) intervention studies on changing physical activity patterns (modulations of intensity, frequency and duration of various sorts of physical activity) in relation to weight gain.
- Conduct long-term (more than one year) intervention studies on the interaction between dietary modification and physical activity in relation to weight gain.
- Conduct long-term (at least 1–2 years) intervention studies of dietary modification and physical activity to prevent excessive weight gain and to treat obesity, in relation to cancer risk.
- Conduct intervention studies to determine whether hormonal, biochemical and molecular mechanisms identified in animals are similarly affected by energy intake, physical activity and their interaction in humans.

Conduct community intervention studies to prevent weight gain and promote physical activity

- Establish the effectiveness and efficiency of various community strategies to prevent weight gain and promote physical activity.
- Develop effective strategies for the prevention of overweight and obesity at three levels: community (directed at everyone in the population); selective (directed at subgroups of the populations with above-average risk of developing obesity); targeted (directed at high-risk individuals with existing weight problems but who are not yet obese).
- Determine the characteristics of substantial and sustainable interventions to promote physical activity. For example, a comprehensive intervention to promote bicycle use for transportation might be tested with multiple components such as bicycle paths, relief of taxes on bicycle purchases, secure bicycle storage and other measures.
- Determine whether physical activity and weight control strategies can be replicated under different situations and in different populations.

Carry out studies in humans to establish the mechanisms by which weight gain and physical activity are related to cancer development (at least for all sites reviewed in this volume)

- Conduct studies of the effects of physical activity on menarche, menstrual cycle characteristics and endogenous sex hormones in girls and young women.
- Evaluate the acute versus chronic effects of physical activity on mechanistic pathways related to cancer, especially for moderate-intensity activity, the level most likely to be adopted by individuals.
- Carry out mechanistic studies to identify physiological processes that can be used as biomarkers of energy status in relation to cancer prevention.
- Identify surrogate end-point markers for cancer risk that are modulated by either the level of energy intake and/or the level of physical activity, such as polyps or breast density.
- Study the long-term effects of physical activity and weight control on sex hormones and insulin-like growth factor 1 (IGF-1).
- Study the role of prostaglandins in the mediation of the association between physical activity and weight gain and as intermediate indicators of cancer development.

Conduct experimental and mechanistic studies relevant to the circumstances of human activity to clarify the mechanisms by which weight gain and lack of physical activity lead to cancer development in animal models.

- Develop animal models, including genetically modified animals, that replicate patho-physiological processes related to cancer in humans such as pre- and postmenopausal breast cancer.
- Use existing and new animal models to explore the hormonal, biochemical, and molecular mechanisms of cancer prevention by maintaining body weight through energy intake, physical activity and their interactions.

- Conduct research with animal models to establish the components of exercise such as duration, frequency and intensity that influence cancer end-points.
- Develop biomarkers for evaluating the interactions between reducing energy intake (via dietary restriction) and increasing energy expenditure (by physical activity) in various combinations.
- Examine whether antagonistic interactions exist between reducing energy intake via dietary restriction and increasing energy expenditure by physical activity that could nullify the beneficial effects of either type of intervention for cancer prevention.

Recommendations for public health¹

Obesity cannot be prevented or managed, nor physical activity promoted, solely at the level of the individual. Governments, the food industry, international agencies, the media, communities and individuals all need to work together to modify the environment so that it is less conducive to weight gain.

A number of recommendations assume a certain level of infrastructure which may not exist in developing countries. However, the underlying targets to improve dietary quality and ensure appropriate levels of physical activity for healthy weight are relevant for developing countries and should be incorporated into strategies to prevent the situation from worsening.

The health consequences and economic costs of weight gain and physical

inactivity are enormous. Thus, substantial public investment is both appropriate and necessary in order to have a major impact on these problems.

Most current weight guidelines indicate a desirable BMI range of 18.5 to 25 kg/m², based primarily on the relationships of body weight to risks of cardiovascular diseases, diabetes and total mortality. The benefits of maintaining weight in this range clearly extend to reduced risks of important cancers. This relatively wide range of BMI is used because the ratio of fat to lean mass can vary among individuals of the same weight. However, within this range of BMI, the degree of adiposity varies substantially and is influenced by metabolic abnormalities. Most individuals will experience lower risks of

cardiovascular disease and diabetes if they maintain their weight within the lower part of this range.

For persons who are already overweight or obese, most current recommendations first emphasize that additional weight gain should be avoided, and then that weight reductions of 5 to 10% are desirable. Direct evidence does not exist at present that weight reduction will lead to reduced risks of cancer. However, hormonal changes produced by weight loss seem likely to reduce risks of some cancers, and epidemiological evidence suggests that loss of weight even late in life would favourably affect the risks of breast and endometrial cancer.

Governmental and non-governmental organizations

- Public education should provide timely and accurate information on the epidemic of obesity and inactivity, and on ways this can be addressed.
- Governments at local and national levels should ensure that school-children at all stages have proper access at school to healthy meals and to recreation and sports facilities.
- Governments at local and national levels, as well as non-governmental organizations, should provide adequate funding for effective physical education programmes in schools.
- Communities and buildings should be designed to encourage use of stairs and walking. A proportion of transportation budgets should be allocated for development of bicycle and pedestrian facilities, notably in urban areas.
- In developing countries there are dietary traditions, behavioural patterns and infrastructures that potentially could aid programmes for prevention of weight gain. Efforts should be made to prevent the loss of cultural traditions that promote healthy diets and physical activity.

¹ In general, the following recommendations are relevant to adults up to the age of 75 years, though this age limit may rise as populations improve in their lifetime adherence to healthy lifestyles. Where relevant, they have been drawn from a number of source documents (e.g. World Cancer Research Fund, 1997; WHO Consultations on Obesity, 1998).

Worksites and schools

- Employers should encourage physical activity and weight control by all employees. Methods can include provisions for exercise areas at work, showers, financial incentives to walk, bicycle or use public transportation rather than cars.
- School curricula should include adequate teaching on food, nutrition and health, and on the importance of active living.
- Schools should include one hour of physical education on most days.

Health professionals and educators

- Health professionals should counsel individuals about a healthy range of body weight. For persons currently within the healthy range, it is recommended that weight gain during adult life should not exceed 5 kg.
- Medical schools and other health science professional programmes should make the study of food, nutrition and physical activity and their relation to health and disease an integral part of the training of health professionals.
- Physicians and health-care providers should counsel their patients on the need for an active lifestyle for the prevention of cancer and other non-communicable diseases.
- Health-care providers and educators should set a personal example by engaging in regular physical activity and controlling their weight to the best of their ability.
- Health-care providers and teachers should take an active role in their communities to support regular physical activity and weight control.
- Maternal and child-health programmes can provide a suitable context for promoting awareness of the need for physical activity and preventing weight gain, particularly in developing countries.

Families and individuals

- Prevention of overweight and obesity should begin early in life. It should be based on the development of life-long healthy eating and physical activity patterns. However, it is never too late to benefit from starting to be more active.
- Individuals should be encouraged to maintain physical activity in order to promote energy balance and weight control. The primary goal should be to perform continuous physical activity on most days of the week. At total of one hour per day of moderate-intensity activity such as walking may be needed to maintain a healthy body weight, particularly for people with sedentary occupations. More vigorous activity, such as fast walking, several times per week may give some additional benefits regarding cancer prevention. Therefore, planned vigorous activities such as sports should be undertaken according to individual interests and capabilities.
- Individuals should where possible give priority to the more active alternatives in their daily lives.
- Parents and individuals should limit the purchase and availability at home of high-energy foods and beverages with low nutritional value, such as soda beverages and baked snacks and instead provide healthy foods, in particular an abundant supply of fruits and vegetables and whole grain products.