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# Risk factor control and medical therapy of coronary artery disease in Taiwan – Review and Recommendations – Part IV: Life style modifications for patients with coronary artery disease

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**Abstract:** Cardiovascular disease (CVD) is the leading cause of death in the world and the second important cause of death in Taiwan. Atherosclerosis CVD (ASCVD) especially coronary artery disease (CAD) is the major cause of CVD [1]. Clinically, the presentation of CAD can be divided into acute unstable disease, so-called acute coronary syndrome (ACS) and chronic stable disease. Up to now, the main risk factors for CAD are known as hyperlipidemia, hypertension, hyperglycemia, smoking and family history. The control of the above risk factors and lifestyle modifications can improve the prognosis of CAD patients [1,2]. Here, we described the blood lipid control, blood pressure control, blood glucose control, and lifestyle modifications for CAD in Taiwan. The followings are the part IV for lifestyle modifications.

## 1. Body weight control

Both overweight and obesity are associated with an increased risk of CVD death and all-cause mortality. All-cause mortality is lowest with a BMI of 20–25 kg/m<sup>2</sup> (in those < 60 years of age); further weight reduction cannot be considered protective against cardiovascular disease. It is recommended that subjects with healthy weight maintain their weight. It is recommended that overweight and obese people achieve a healthy weight (or aim for a reduction in weight) in order to reduce blood pressure, dyslipidaemia and risk of developing type 2 diabetes mellitus (DM), and thus improved the CV risk profiles [1,2].

## 2. Lifestyle dietary modification

The international society (AHA and ACC) guidelines have recommended essentials of a healthy diet for the general public and for patients at risk for cardiovascular disease [3]. Lifestyle modification focus on dietary recommendation for control LDL is a dietary pattern that emphasizes intake of vegetables, fruits, whole grains, legumes, healthy protein sources (low-fat dairy products, low-fat

poultry without the skin, fish/seafood, and nuts), and nontropical vegetable oils; and limits intake of sweets, sugar-sweetened beverages, and red meats [3–5]. This dietary pattern should be adjusted to appropriate calorie requirements, personal and cultural food preferences, and nutritional therapy for other medical conditions including diabetes [4]. In addition, the dietary pattern that achieves 5% to 6% of calories from saturated fat. Adults should reduce percentage of calories from saturated fat and trans fat to benefit from LDL-C reduction [3].

### 3. Lifestyle dietary modification for blood pressure (BP) control

Lifestyle modification focus on dietary recommendation for blood pressure control is also similar as diet suggestion for lipid control: (1) dietary pattern should emphasize intake of vegetables, fruits, and whole grains; includes low-fat dairy products, poultry, fish, legumes, nontropical vegetable oils, and nuts; and limits intake of sweets, sugar-sweetened beverages, and red meats. In addition, this pattern should adapt to appropriate calorie requirements, personal and cultural food preferences, and nutrition therapy for other medical conditions (including diabetes) [6]; (2) Reduce sodium intake is the treatment of choice for lifestyle medication for blood pressure control. It is suggested that consume no more than 2400 mg of sodium/day. In addition, further reduction of sodium intake to 1500 mg/day can result in even greater reduction in blood pressure. Reducing sodium intake by at least 1000 mg/day can significantly lower blood pressure [6]. (3) It is also recommended to combine healthy diet (DASH diet) to reduce sodium intake for blood pressure reduction. The DASH dietary pattern is high in vegetables, fruits, low-fat dairy products, whole grains, poultry, fish, and nuts and is low in sweets, sugar-sweetened beverages, and red meats. The DASH dietary pattern is low in saturated fat, total fat, and cholesterol. It is rich in potassium, magnesium, and calcium, as well as protein and fiber [6].

### 4. Lifestyle dietary modification of physical activity

Regular physical activity reduces the risk of many adverse health outcomes over a wide age range: all-cause and CVD mortality are reduced in healthy individuals by 20–30% in a dose–response fashion [7,8]. PA has a positive effect on many risk factors, including hypertension, low-density lipoprotein cholesterol (LDL-C) and non-HDL-C, body weight and type 2 DM [9]. Health providers should assess the PA level in any subject (how many days and minutes per day are spent on average doing PA at moderate or vigorous intensity). They should warn against inactivity and help add PA to daily life. Subjects should be advised on appropriate types of activities and ways of progressing and should be helped to set personal goals to achieve and maintain the benefits.

Encourage maintaining adequate physical activity and avoid sedentary behavior is recommended to all population. Aerobic exercise should be offered to patients with known CAD, usually as part of a structured cardiac rehabilitation program, with the need for an evaluation of both exercise capacity and exercise-associated risk. In general, it is recommended for healthy adults of all ages to perform at least 150 minutes a week of moderate intensity or 75 minutes a week of vigorous intensity aerobic PA or an equivalent combination thereof [7,8,10,11]. For greater achievement of target of blood pressure and lipid, adults are advised to engage in aerobic physical activity, keeping 3–4 sessions per week, lasting on average 40 min per session, and involving moderate to vigorous intensity physical activity is suggested for lipids and BP control [12]. Similar suggestion has also been reported: for additional benefit in healthy adults, a gradual increase in aerobic physical activity to 300 minutes a week of moderate intensity, or 150 minutes a week of vigorous intensity aerobic physical activity, or an equivalent combination thereof is recommended [8,10].

### 5. Smoking

Smoking is a lethal addictive disorder. A lifetime smoker has a 50% probability of dying due to smoking, and on average will lose 10 years of life [13]. Smoking is an established cause of a plethora of diseases and is responsible for 50% of all avoidable deaths in smokers, half of these due to CVD.

The 10-year fatal CVD risk is approximately doubled in smokers. Therefore, smoking is the major cardiovascular risk factor that all subjects should avoid cigarette smoking [14]. The benefits of smoking cessation for CVD treatment have been extensively reported [15] and quitting smoking is potentially the most effective of all preventive strategies for CVD prevention, being associated with a reduction in mortality of 36% after MI [16]. Clinicians can take advantage of the unique situation and emphasize that the risk of future CAD events can be dramatically reduced by smoking cessation. Thus, It is recommended to stop all smoking of tobacco or herbal products, as this is strongly and independently causal of CVD [13,17–20].

In addition to stopping smoking, it is important to pay attention to the issue of passive smoking. Passive smoking increases the risk of CAD. A smoking spouse or workplace exposure increases CVD risk by an estimated 30% [21]. Therefore, passive secondary smoking carries significant risk, with the need to protect non-smokers. Thus, it is recommended that all passive cigarette exposure should be avoided [21,22]. It is recommended to identify smokers and provide repeated advice on stopping with offers to help, by the use of follow up support, nicotine replacement therapies, varenicline, and bupropion individually or in combination to quit smoking and offered cessation assistance [23,24].

## 6. Alcohol drinking

Drinking immoderate amounts of alcohol has harmful effects on health Excessive drinking is associated with high BP [25]. In the PATHS trial investigating the effects of an alcohol treatment program on BP, there was a 1.2/0.7 mmHg greater reduction for every 1.3 drink/day difference [26]. In a meta-analysis of 15 RCTs with a total of 2,234 participants, alcohol reduction was associated with a significant reduction of 3.31 mmHg in SBP and 2.04 mmHg in DBP [27]. It is generally agreed that alcohol intake should be limited to <20 gms/d in men and <10 gms/d in women.

## 7. Recommendations

1. Overweight and obese people may achieve a healthy weight (or aim for a reduction in weight) in order to reduce blood pressure, dyslipidaemia and risk of developing type 2 DM, and thus improved the CV risk profiles (**Class I, LOE: A**).
2. Lifestyle modification focus on dietary recommendation for LDL-C control is a dietary pattern that emphasizes intake of vegetables, fruits, whole grains, legumes, healthy protein sources (low-fat dairy products, low-fat poultry without the skin, fish/seafood, and nuts), and nontropical vegetable oils; and limits intake of sweets, sugar-sweetened beverages, and red meats. (**Class I, LOE A**). Adults should reduce percentage of calories from saturated fat and trans-fat to benefit from LDL-C reduction (**Class I, LOE: A**).
3. Reduce sodium intake is the treatment of choice for lifestyle medication for blood pressure control It is suggested that consume no more than 2400 mg of sodium/day. Further reduction of sodium intake to 1500 mg/day can result in even greater reduction in blood pressure (**Class I, LOE A**). Reducing sodium intake by at least 1000 mg/day can significantly lower blood pressure (**Class II, LOE B**). It is also recommended to combine healthy diet (DASH diet) to reduce sodium intake for blood pressure reduction (**Class I, LOE: A**).
4. It is recommended for healthy adults of all ages to perform at least 150 minutes a week of moderate intensity or 75 minutes a week of vigorous intensity aerobic physical activity or an equivalent combination thereof (**Class II, LOE A**). Aerobic physical activity, keeping 3–4 sessions per week, lasting on average 40 min per session, and involving moderate to vigorous intensity physical activity are suggested for lipids and blood pressure control (**Class II, LOE A**). In healthy adults, a gradual increase in aerobic physical activity to 300 minutes a week of moderate intensity, or 150 minutes a week of vigorous intensity aerobic physical activity, or an equivalent combination thereof are recommended (**Class I, LOE: A**).

5. It is recommended to stop all smoking of tobacco or herbal products, as this is strongly and independently causal of CVD (**Class I, LOE B**). Bll passive cigarette exposure should be avoided (**Class I, LOE: B**).
6. Alcohol intake may be limited to <20 gms/d in men and <10 gms/d in women. (**Class II, LOE C**).

#### Conflicts of Interest:

The authors declare no conflict of interest.

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