

# Weight Management in Cardiac Rehabilitation: Evaluation, Assessment, and Interventions

Naglaa Hussein\*

Department of Physical Medicine and Rehabilitation, Alexandria University, Alexandria, Egypt

\*Corresponding author: Naglaa Hussein, Department of Physical Medicine and Rehabilitation, Alexandria University, Alexandria, Egypt; E-mail: nagla\_kashif@hotmail.com

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## Abstract

Obesity is one of the most common and important risk factors for cardiovascular diseases. That is equally applicable for both genders. Obesity, itself is considered independent risk factor as well as lead to exaggeration and amplifications of other common risk factors as diabetes, dyslipidemia and hypertension. Evaluation of obesity, and different interventional methods should be part of any structured cardiac rehabilitation programs.

### Keywords:

Obesity; Cardiovascular diseases; Hypertension

for a new generation of integrated basic and clinical research to focus on the following questions:

- Who should lose weight?
- Who can lose weight?
- How much weight can be lost?
- What is the best approach for an individual?
- How can weight maintenance be enhanced?

Secondary prevention programs need to focus concentrated efforts on the careful evaluation and treatment of overweight patients. Program specialists must identify patients in need of weight management in order to provide appropriate further evaluation and focused intervention.

## Literature Review

### Evaluation of body weight, body mass index and body composition

All patients should have weight and height measured and Body Mass Index (BMI) determined at the initial visit as part of the routine evaluation. Body composition analysis using skin folds or underwater techniques, girth measurements, waist-to-hip ratios, or other methods may also be incorporated into this evaluation process [2].

### Body mass determination

Well-defined and reliable indices of weight and body composition should be assessed at baseline, since simple height-weight measures do not adequately assess adiposity. In addition to height and weight, BMI should be determined and waist to hip circumference ratios should be considered. These anthropometric measurements are easily obtained and provide a gauge for determining levels of obesity and distribution of body fat (Table 1). Initial determination of caloric goals for the purpose of exercise prescription also necessitates an estimation of body composition or excess weight. Clinical research tools necessitate an estimation of body composition or excess weight. Clinical research tools such as hydrostatic weighing, Computerized Tomography (CT), Magnetic Resonance Imaging (MRI), and Dual-Energy Absorptiometry (DEXA) are most accurate but not practical for use in secondary prevention settings [3].

## Introduction

Obesity has been determined to be an important risk factor for cardiovascular disease among men and women, although specific data on racial/ethnic minorities are lacking. Obesity appears to interact with or amplify the effects of other risk factors by mechanisms that as yet remain frontier for further research. Alarming data from the National health and Nutrition exam surveys show that the prevalence of obesity among Americans has increased over the past 20 years, such that an estimated 47 million adults American are deemed to be overweight. Thus, obesity should be viewed as a prevalent, serious, and, to date, refractory health problem. In large consecutive series of patients enrolled in cardiac rehabilitation programs, the prevalence of obesity in nearly 50%. Surprisingly, weight management and obesity, despite their strong link to other risk factors, have not been a primary focus in cardiac rehabilitation. This is evidenced by the sparsity of scientific data of this subject in cardiac rehabilitation literature [1]. It is very clear however, that more data are needed and that additional focused interventions must be performed.

## Nature of the problem

Obesity should be viewed as heterogenous problem that stem from genetic, biologic, and behavioral factors. Accordingly, the expert panel of scientist at the prevention III Conference called

Body mass index Kg/m <sup>2</sup>	Men	Women
Ideal	21-25	21-25
Obese	20-35	20-30
Markedly obese	>30-40	>30-40
Morbidly obese	>40	>40
Waist to hip ratio <sup>+</sup>		
Ideal	<0.90	<0.80
At risk	>0.95	>0.85
%body fat		
Ideal	12-18	18-25

**Table 1:** Expert panel; conference III body mass index and waist hip ratio.

Various alternative approaches to estimating body composition have been employed in cardiac rehabilitation programs, including Bioelectrical Impedance (BIA), Near-Infrared Inter-Actance (NIR), fat-fold, and circumferential measures. Of these, the validity of BIA, and NIR techniques in over-fat or obese adult's remains questionable and at the least, must be measured under strict conditions. While fat-fold and circumferential measurements are better estimate of percentage of body fat, serial measures for comparative purposes and estimation of recommended weights from these measurements are necessary inappropriate. Used as absolute measures rather than for the determination of percentage fat, individual fat-fold and/or circumference measures, in addition to BMI can provide meaningful and accurate comparative feedback to patients throughout their participation in the program. Clinician may find the use of BMI to be a practical approach to determining exercise priorities. BMI may be calculated as follows:  $BMI = Wt(kg)/Ht^2(meters)$

In general, a BMI of less than 25 is desirable; BMI above 27 or 28 are associated with increased health risks.

### Intervention at cardiac rehabilitation

Weight management interventions should be targeted to those patients whose weight and body composition place them at increased cardiac risk, and whose weight may adversely affect other risk factor such as diabetes, abnormal lipids, and hypertension. All patients should achieve and maintain an appropriate/desirable weight and should begin diet management and physical activity as appropriate. Dietary evaluation is an essential component of a weight management program. Individuals should be assessed for total daily caloric intake, fat and cholesterol intake, and adequate nutrient and fiber content of their diet. Evaluation of eating habits including time of day, portion sizes, snacking, triggers, and social-cultural influences are important. Caloric expenditure during domestic, occupational and leisure tasks as well as during exercise is helpful to determine caloric balance. The presence of underlying metabolic abnormalities including (hypothyroidism, Cushing's disease, and other endocrine disorders) should be noted. Family

history of obesity as well as the patient's weight history should be assessed to evaluate possible genetic influences. Finally, assessment of the patient's personal perception of weight and appearance can be helpful in setting reasonable short-term and long-term goals [4].

**Intervention outline:** Intervention to promote weight loss in patients determined to be at an undesirable body weight and composition should focus on the following areas:

- Identifying and treating underlying metabolic disorders when possible.
- Adjusting caloric intake dietary counselling.
- Increasing caloric expenditure increased daily physical activity and a regular program of exercise.
- Implementing behavioral interventions to promote long-term adherence.
- Considering medical intervention in patients, whose obesity has been determined to be seriously detrimental to their health, and only as adjustment to comprehensive weight control program.

### Discussion

Secondary prevention programs that combine exercise, dietary education, counseling, and behavioral interventions designed to reduce body weight can help patients lose weight. These multi-factorial cardiovascular risk-reduction interventions are recommended as components of secondary prevention. Because of the potential adverse effects of appetite suppressant medications, these drugs should only be considered for the markedly obese and only under close and careful surveillance of a physician who is well trained and experienced in the appropriate users of these drugs. Individualized recommendations for dietary modification should be made with consideration of reasonable goals and likelihood of compliance. Spousal or living-partner involvement in nutritional counseling sessions is important to foster compliance and support, particularly if this person is primary involved with food shopping and meal preparation. Nutrition instructions should emphasize helping the patient to establish a new eating style that is low in sugar, fat and cholesterol and high in nutrients, complex carbohydrates, and fiber [5].

In the initial stages of weight loss, both total daily caloric intake and percentage of fat calories should be reduced. Most women do well in 1200 to 1500 calories a day and men on 1500 to 2000 calories a day, depending on their age, height, and activity level. Much of the calories a day, depending on their age, height, and activity level. Much of the calories moderation tends to occur spontaneously as patients focus on higher-nutrient choices. A rate of weight loss of one to two pounds per week or 1% of body weight per week is considered safe. A multivitamin/mineral supplement is recommended since it is difficult to ensure nutritional adequacy on diets of less than 1800 calories a day. Patients should be counseled to avoid skipping meals or undertaking periods of nutritional deprivation. Instead they should adopt a regular eating pattern that begins with breakfast and includes four to six small feedings per day spaced three to four hours apart. In addition to improving

metabolic regulation, this recommended eating pattern eliminated the intense feelings of physical deprivation that may characterize erratic, large-meal eater [6].

Commonly lead to discriminate food choices and recurrent binges. The use of Very Low-Calorie Diet (VLCD) is beyond the scope of typical cardiac rehabilitation programs. As with all patients, increased daily physical activity should be recommended [7]. Walking, stair climbing, gardening, and recreational activities (bowling, golf, tennis) can be incorporated into the daily and weekly schedule to promote general health and caloric expenditure. The exercise program should be designed to promote at least 250 to 300 calories of energy expended per session by the point of completing 12 weeks of early outpatient training, aiming for 1250 calories a week, which would include additional daily physical activity. This may be difficult to attain in cardiac patients who may have a low exercise capacity [8]. Therefore, additional or lengthier exercise sessions may be useful in these patients. The choice of exercise modalities is particularly important for the individual aiming to lose weight. Weight-bearing activities appear to provide the greatest caloric expenditure and should be recommended whenever possible after considering any musculoskeletal limitations. Other concerns include body weight limits for use of treadmills and stair-climbers; increased difficulty of obtaining adequate ECGs during telemetry monitoring; and modification of training equipment to optimize efficacy and comfort for the obese individual.

## Conclusion

Larger seats for stationary and recumbent cycles and a platform step to utilize equipment are suggested. Some patients may have to walk in hallways or on an adjacent track (if available) until they reach a weight appropriate for the treadmill. If the overweight individual cannot use a treadmill or stationary

cycle to perform the initial exercise test, a six-minute walk test may be used for exercise prescription and functional capacity assessment. The use and type of specific behavioural interventions, beyond basic educational sessions, are important. Additionally, measures of patient compliance should be assessed, including attendance rates and activities during each session. Structured outcome measures should be made periodically to assess both short term and long-term results and the factors affect them.

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