# The ABCs of Atkins Based Carbohydrate-Reduction as a Treatment for Obesity

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In the early 1990s, the World Health Organization (WHO) officially recognized obesity as a worldwide epidemic. Despite the rigorous implementation of prevention programs after this global awareness of obesity, the prevalence of this metabolic disease is still increasing (WHO, 2003ab). It is currently estimated that 1 billion adults are overweight, with some 300 million being clinically obese (as determined by their Body Mass Index, or BMI). Individuals are considered overweight if their BMI exceeds 25 $kg/m^2$, and obese if their BMI is higher then 30 $kg/m^2$ (WHO, 2003ab). The increasing global prevalence of obesity is also leading to additional health problems (see Figure 1 for the Canadian progression of obesity), as obesity is associated with type 2 diabetes mellitus, heart disease, stroke, liver disease, sleep apnea, pulmonary dysfunction, musculoskeletal disease, female infertility, and cancer (National Task Force on the Prevention and Treatment of Obesity, 2000). The above associations do not come without cost to Canada's health care system, as the direct cost of obesity in 1997 was estimated to be $1.8 billion (Birmingham, Muller, Palepu, Spinelli, & Anis, 1999).

As mentioned in a WHO report (2003b), this epidemic "reflects the profound changes in society and in behavioural patterns of communities over recent decades." While the WHO admits that genetics do play some role in predicting future risk for obesity, it stresses that one must seek to balance caloric intake with physical activity to maintain an energy balance (2003a). If one consumes more energy than needed for daily activities and exercise, this excess will be stored as fat in adipose tissue. To maintain the equilibrium between consumption and expenditure of calories, the American Heart Association (AHA) recommends that individuals limit the intake of foods high in saturated fats (AHA, 2004). Instead, individuals should emphasize eating fruits and vegetables (at least 5 servings a day), as well as grains (at least 6 servings a day). As well, one should attempt to eat fat-free or low fat dairy products and lean meats. The AHA claims that such a diet can best reduce the major risk factors for heart attacks: high blood cholesterol, high blood pressure, and excess body weight (AHA, 2004).

## The Basis of The Novel Atkins Approach

A different form of dietary recommendation has been sweeping across North America known as the Atkins' diet. First published in 1972 – Dr. Atkins' Diet Revolu-

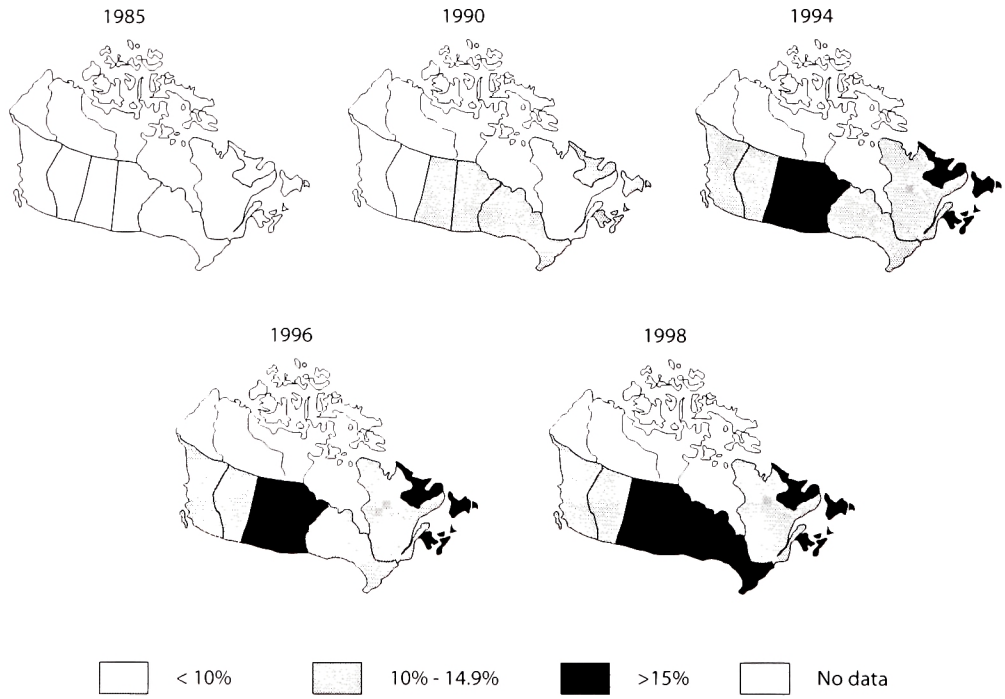



***Figure 1:*** *Above data shows progression of Obesity epidemic in Canada from 1985 to 1998 (Katzmarzyk, 2002)*

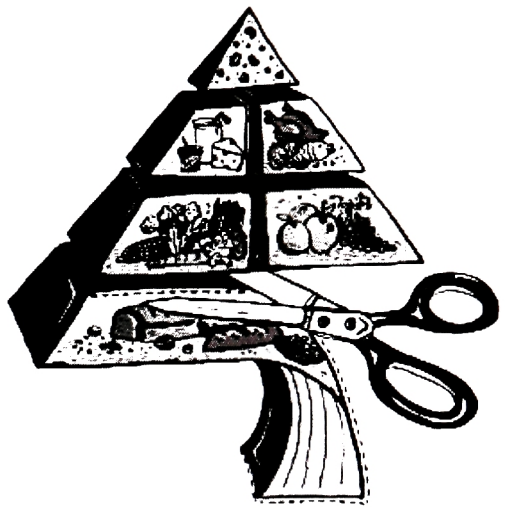
tion – the diet has undergone several revisions in 1992, 1999, and most recently in 2001 as the Dr. Atkins' New Diet Revolution. In 2003, the most recent evolution of this diet was published – Atkins' for Life. While the AHA diet recommends a reduction of fats, the Atkins' diet allows individuals to eat all the fat and protein they want providing they initially reduce carbohydrate intake to 20 g each day (www.atkins.com). The Atkins' website maintains that this approach is not to be seen as a diet, rather a lifetime nutritional philosophy that stresses the consumption of nutrient dense foods while limiting the intake of refined/processed carbohydrates such as breads, pastas, sugars, cereals and starchy vegetables. While the low-carbohydrate approach to weight loss has been around since the 1970s, it is estimated that some 20 million individuals worldwide are currently following the Atkins' philosophy (www.atkins.com).

It is maintained that the Atkins' diet facilitates weight loss because it induces a state of ketosis in the body (www.atkins.com). A ketogenic diet stimulates the metabolism of a fasting body, and has sometimes been used as a treatment for children suffering from seizures that are not responding to medical interventions (Freemen et al., 1994). When the amount of glucose available in the body is limited (by a diet in this case), fats from adipose tissue will be burned to satisfy energy requirements (Freemen et al., 1994). However, fats are not burned down completely. Rather, remnants of fat molecules remain in the blood in the form of ketone bodies. These ketone bodies are known to have an appetite suppressing effect, which is why low-carbohydrate diets are known to work without making the dieter hungry (Freemen et al., 1994).

## Comparing Atkins' and AHA's Dietary Recommendations

It is understandable that there is much confusion amongst individuals who are looking to change their diet to lose weight. After all, dieters are faced with two conflicting dietary philosophies: one stressing a low-carbohydrate, high-fat diet approach and the other recommending a low-fat diet with plenty of carbohydrates in the form of fruits and grains (See Table 1 for the nutritional components of leading diets, including Atkins' and AHA). Setting aside all the marketing campaigns urging us to one side or the other, one must ask if there is any scientific proof that one diet is superior with respect to health gains and weight loss.

As mentioned in Kappagoda et al., this conflict in dietary recommendations can be traced back to a 2002 abstract published by Westman and colleagues (2004).



*(Triplett, 2005)*

This 2002 abstract was one of the first pieces of literature reporting the superiority of a ketogenic diet over a low-fat, low-calorie diet. Although the American Heart Association was never mentioned directly in the article, Kappagoda and colleagues comment that "because the study was funded by the Atkins' Center for Complementary Medicine, it swiftly became labelled as a trial of the Atkins' diet versus the AHA diet," (2004, pp 725). Additional research on this topic reported that dieters on a low-carbohydrate diet lost more weight, had lower triglyceride levels, and had higher high density lipoproteins (HDL) levels (all statistically significant) after 6 months when compared to a low-fat diet (Yancy, Jr., Olsen, Guyton, Bakst, & Westman, 2004). The authors concluded that those who followed a 24 week low-carbohydrate diet lost more weight and body fat when compared to those who followed a low-fat diet.

Studies then began to emerge that evaluated the outcomes of this diet over a longer period of time. One randomized control trial (RCT) published in the *New England Journal of Medicine* compared the Atkins' diet to a conventional low-fat diet (Foster et al., 2003). Although they found that the Atkins' diet did result in statistically significantly more weight loss within a 6 month period, these differences were not significant after a year. This result was also observed in another RCT, which followed patients for a duration of one year (Stern et al., 2004). While Stern et al. detected no statistical difference in weight loss between individuals on a low-carbohydrate diet and those on a low-fat diet, they did report a more favourable change in triglyceride level, HDLs and glycemic control (all significant) for those individuals on the low-carbohydrate diets when compared to the low-fat variety. Based on these results, the authors concluded that restriction of carbohydrates in obese individuals may lead to favourable metabolic changes, but it is still unknown if

***Table 1:*** *Comparison of Macronutrients in Two LC-HP Diets With the ADA Exchange Diet, the AHA Dietary Guidelines, and IOM Recommendations (Kappagoda et al., 2004)*

| | Atkins' Diet (5) | Protein Power (6) | ADA Exchange (7) | NECP III (4) | AHA Guidelines (3) | IOM/NAS (17) |
|---|---|---|---|---|---|---|
| Calories (kcal) | 1,600 | 1,600 | 1,600 | 1,600 | 1,600 | 1,600 |
| Carbohydrate (g) | 22 (5%) | 33 (8%) | 240 (60%) | 220 (55%) | 220 (55%+) | 220 (50%+) |
| Protein (g) | 146 (35%) | 149 (35%) | 82 (20%) | 60 (15%) | 28-72 (12%-18%) | 90 (22%) |
| Fat (g) | 104 (59%) | 97 (53%) | 35 (20%) | 53 (30%) | 53 (<30%) | 40 (27%) |
| Saturated Fat (g) | 47 (26%) | 33 (19%) | 11 (6%) | <7 | 18 (>10%) | minimize |
| Cholesterol (mg) | 924 | 657 | 112 | <200 | <300 | minimize |
| Dietary Fiber (g) | 4 | 11 | 22 | 20-30 | >25 | 25 for women, 39 for men |

*Note only the midpoint of the ranges are quoted for IOM/NAS and NCEP III.*
*ADA = American Diabetes Association; AHA = American Heart Association; IOM/NAS = Institute of Medicine/National Academy of Science; LC-HP = low-carbohydrate-high protein; NCEP = National Cholesterol Education Program.*

an Atkins-like diet will help prevent cardiovascular disease or diabetes (Stern et al., 2004). To date, the above studies are the only RCTs following the metabolic effects of a low-carbohydrate diet for at least one year.

Recent reviews are also questioning the long-term benefits of low-carbohydrate diets. One paper identifies the rather high drop-out rates due to non-compliance in studies utilizing Atkins-like diets (Lara-Castro & Garvey, 2004). This would make it difficult to generalize the results of the study to the general population and illustrate that a large proportion of people may have difficulty following such diets. The authors also point out that the few studies conducted thus far do not indicate that an Atkins-like diet is more effective in achieving weight loss when compared to a low-fat, high-fibre diet. Lastly, the long-term safety of an Atkins-like diet has also been questioned (Lara-Castro et al., 2004), a theme common amongst other reviews. Kappagoda et al. comment that a low-carbohydrate diet does not fulfill all the nutritional requirements for healthy individuals with regards to vitamin and mineral intake, as well as dietary fibre (2002). If this is true, dieters would be forced to take vitamin and mineral supplements to receive nutrients they should be receiving through food consumption. In order to better understand potential health risks, some experts believe that more research needs to be conducted to determine if the benefits of an Atkins-like diet outweigh the risk (Harper & Astrup, 2004). They comment that in order to fully understand the risks, research should not focus solely on cardiovascular risk factors, but also on bone health, renal function and cancer risk – both in healthy and obese individuals. Until the risks are fully understood, Harper and Astrup comment that it would be "irresponsible" for a medical professional to recommend the Atkins' diet to their patients (2004).

## Resorting To Tried And True Methods Of Weight Loss

The introduction of low-carbohydrates on the dieting scene helps illustrate an important lesson: patients should be wary of novel treatments when deciding on a course of action to overcome a disease. In this case, dieters are exposed to a new nutritional philosophy that contradicts the low-fat, high fibre diets doctors have been traditionally recommending. It is surprising that, despite any proof of long-term weight-loss results or understanding of health consequences, the Atkins' diet has 20 million worldwide followers (www.atkins.com). Not as surprising is the number of new food products introduced to capitalize on the new craze. It was estimated that in the past two years, 1558 new low-carbohydrate products have been introduced to grocery stores (Kadlec, 2004). Among these products are low-carbohydrate breads, soft drinks, pasta, and alcoholic beverages. It is expected that these food products, as well as books and guides preaching the low-carb lifestyle, will gross $30 billion in revenue this past year (Kadlac, 2004).

In the end, no individual should be discouraged from changing his/her lifestyle in order to achieve and maintain a healthy body weight. After all, it was recommended that all overweight or obese individuals attempt to lose weight in order to decrease their risk of mortality from obesity related diseases such as coronary heart disease, stroke and type 2 diabetes (Expert Panel on the Identification, Evaluation, and Treatment of Overweight and Obesity in Adults, 1998). However, such an endeavour should not be undertaken without medical advice from a physician. It is through such patient/physician interaction that patients can be adequately advised on how to make dietary and lifestyle changes that will benefit their health and well-being later in life. M