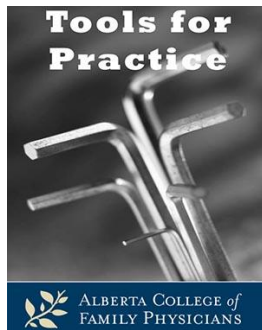


Tools for Practice is proudly sponsored by the Alberta College of Family Physicians (ACFP). ACFP is a provincial, professional voluntary organization, representing more than 4,800 family physicians, family medicine residents, and medical students in Alberta. Established over sixty years ago, the ACFP strives for excellence in family practice through advocacy, continuing medical education and primary care research. www.acfp.ca

September 24, 2018



Less Pancakes, More Bacon? The Ketogenic Diet for Weight Loss

Clinical Question: Is the ketogenic diet effective for weight loss?

Bottom Line: At best, ketogenic diets help patients lose ~2 kg more than low-fat diets at one year, but higher quality studies show no difference. Weight loss peaks ~5 months but is generally not sustained. There are no randomized controlled trials (RCTs) on mortality or cardiovascular disease. An individual's weight change can vary -30 to +10 kg with any diet.

Evidence:

- Focusing on most relevant systematic reviews:
 - Systematic review of 13 RCTs of ketogenic versus low-fat diets, 1,577 participants (61% women, BMI 30-43). At 12-24 months ketogenic diet:¹
 - Lost 0.9 kg more than low-fat diet (statistically different).
 - Statistically significant but likely clinically meaningless changes in surrogate markers (example LDL 0.12 mmol/L higher).
 - Drop-out 13-84% across studies.
 - Systematic review of 11 RCTs and 1,369 participants (71% women, BMI 30-36) at 6-24 months:²
 - Ketogenic-type diet lost 2.2 kg versus low-fat diet, statistically different but results inconsistent.
 - No difference if focus on higher quality studies.
 - Surrogate marker changes similar to above.^{1,2}
- Other systematic reviews (5-24 RCTs) confounded by including low-carbohydrate diets that are likely not ketogenic. Results inconsistent: No difference in weight³⁻⁵ to 3.6 kg weight loss.⁶⁻⁸
- No systematic reviews or RCTs² examined mortality or cardiovascular disease.
- 2018 RCT (609 patients):⁹ Weight loss at one year:
 - Low-carbohydrate diet (<20 g/day at start) 6.0 kg versus low-fat diet 5.3 kg; not statistically different.
 - Patient genotypes (favouring one diet type) had no impact on weight loss.
 - Individual's weight change varied from -30 to +10 kg in either group.

Context:

- Typical Canadian diet: 48% carbohydrate, 32% fat, 17% protein.¹⁰
- No standard definition for carbohydrate content in ketogenic diet, but most start with carbohydrate restriction of <20-50 g/day (10% of energy) for ~2 months before slow re-introduction of carbohydrates.^{1,11}
- Weight loss peaks ~5 months, then slow regain.
 - Example:¹² From baseline, weight loss 6.5 kg at five months and 4.7 kg at one year.
- Tendency for decreased caloric intake on ketogenic diet.^{9,12,13}
- Observational data suggests long-term low-carbohydrate consumption may be associated with increased mortality.¹⁴

Authors:

Rhonda Ting BScPharm, G. Michael Allan MD CCFP, Adrienne J Lindblad BSP ACPR PharmD

Disclosure:

Authors do not have any conflicts of interest to declare.

References:

1. Bueno NB, de Melo, IS, de Oliveira SL, *et al.* Br J Nutr. 2013; 110(7):1178-87.
2. Mansoor N, Vinknes KJ, Veierod MB, *et al.* Br J Nutr. 2016; 115(3):466-79.
3. Meng Y, Bai H, Wang S, *et al.* Diabetes Res Clin Pract. 2017; 131:124-31.
4. Hu T, Mills KT, Yao L, *et al.* Am J Epidemiol. 2012; 126 Suppl 7:44-54.
5. Huntriss R, Campbell M, Bedwell C. Eur J Clin Nutr. 2018; 72(3):311-25.
6. Nordmann AJ, Nordmann A, Briel M, *et al.* Arch Intern Med. 2006; 166(3):285-93.
7. Sackner-Berstein J, Kanter D, Kaul S. PLoS One. 2015; 10(10):e0139817.
8. Bravata DM, Sanders L, Huang J, *et al.* JAMA. 2003; 289(14):1837-50.
9. Gardner CD, Trepanowki JF, Del Gobbo LC, *et al.* JAMA. 2018; 318(7):667-79.
10. Canadian Community Health Survey – Nutrition: Nutrient intakes from food and nutritional supplements. Statistics Canada. 2017-06-20. Available from: <https://www150.statcan.gc.ca/n1/daily-quotidien/170620/dq170620b-eng.htm>. Last Accessed: September 13, 2018.
11. Moreno B, Crujeiras A, Bellido D, *et al.* Endocrine. 2016; 54(3):681-90.
12. Shai I, Schwarzfuchs D, Henkin Y, *et al.* N Engl J Med. 2008; 359(3):229-41.
13. Johnstone AM, Horgan GW, Murison SW, *et al.* Am J Clin Nutr. 2008; 87(1):44-55.
14. Seidelmann SB, Claggett B, Cheng S, *et al.* Lancet Public Health. Epub ahead of print August 16, 2018.

Tools for Practice is a biweekly article summarizing medical evidence with a focus on topical issues and practice modifying information. It is coordinated by G. Michael Allan, MD, CCFP and the content is written by practising family physicians who are joined occasionally by a health professional from another medical specialty or health discipline. Each article is peer-reviewed, ensuring it maintains a high standard of quality, accuracy, and academic integrity. If you are not a member of the ACFP and would like to receive the TFP emails, please sign up for the distribution list at <http://bit.ly/signupfortfps>. Archived articles are available on the ACFP website.

This communication reflects the opinion of the authors and does not necessarily mirror the perspective and policy of the Alberta College of Family Physicians.