

EXECUTIVE SUMMARY – Controlled Carbohydrate

Name of Expert Review Group:

Diabetes Expert Review Group

Rationale:

Controlled Carbohydrate (CHO) diet recommendations were reviewed to determine current best practice guidelines. The goals of the group were as follows:

1. Review 2013 Clinical Practice Guidelines (CPG) for the Prevention and Management of Diabetes in Canada regarding the nutritional management of diabetes. Specifically:
 - 1.1 Adults with Type 1 Diabetes (T1D): to determine energy, nutrient needs and macronutrient distribution
 - 1.2 Adults with Type 2 Diabetes (T2D): to determine energy, nutrient needs and macronutrient distribution
 - 1.3 Gestational Diabetes Mellitus (GDM): to determine energy, nutrient needs and macronutrient distribution
2. Determine the need for vitamin and mineral supplementation for adult patients with T1D or T2D or GDM.
3. Provide recommendations for between meal snacks in order to meet nutrient needs while optimizing blood glucose control.

* Pediatric diabetes diets are NOT in scope of these recommendations.

Guidelines:

- | | |
|------------------------|---|
| • Energy | as per standard diet |
| • Carbohydrate | 45-65% of total energy with consideration of CHO distribution |
| • Sucrose | ≤ 10% of total energy (if adequate control of blood glucose) |
| • Fat | 20-35% of total energy |
| • Fibre | 25-50g/day |
| • Alternate sweeteners | allowed |
| • Vitamins & Minerals | daily multivitamin if determined necessary |

Evidence Review:

According to the 2013 CPGs for the prevention and management of Diabetes in Canada, people with diabetes should follow the same diet recommended for the general population in *Eating Well with Canada's Food Guide*. This includes a variety of foods with an emphasis on foods that are low in energy density and high in volume. An adequate intake of CHO, fibre, fat and essential fatty acids, protein, vitamins and minerals is required.¹

The Canadian Malnutrition Task Force's recent report states that up to 45% of hospitalized patients are malnourished³ and that a liberalized diet for this population may help to prevent infections, promote wound healing, prevent a longer length of stay and improve prognosis.²⁻⁴ Because people with diabetes who are hospitalized may also be malnourished, the Diabetes Expert Review Group recommends liberalization of some aspects of the diet to promote adequate intake.

1. **Energy**

Estimated nutrient requirements for people with diabetes are the same as those for the general population and should be assessed based on individual metabolic needs.^{1,2} A range of macronutrient content is recommended to allow for flexibility, patient needs and preferences.

2. **CHO**

The current recommended minimum intake for CHO is no less than 130 grams/day.¹ Total daily intake from CHO should be 45-60% of energy.¹ The expert review group agrees that the Standard Diet CHO range of 45-65% is acceptable. Calorie levels are not recommended but a consistent distribution of CHO at meals and snacks from day to day is recommended to assist in the management of blood glucose levels (BG).^{1,2,4}

The amount of CHO eaten rather than the sugar content or the percentage of the meal eaten, has the greatest impact on blood glucose.⁴ Inclusion of snacks should be based on patient's health, nutritional goals and preferences.⁴ Individuals with T1D should also maintain consistency in CHO quantity and quality.¹ Some individuals will be matching their insulin to CHO quantity and quality.¹ CHO content can be adjusted as required upon RD assessment

3. **Sucrose**

Added sucrose intake up to 10% of total daily energy is acceptable in patients with adequate control of blood glucose.¹ Sucrose-containing foods may help meet the individual's caloric intake goals and satisfaction with the diet.⁴ This will need individual interpretation. However based on the assumption that people with diabetes who are hospitalized often experience higher blood sugars related to disease or injury, the limit for carbohydrate content of dessert is $\leq 20\text{g/serving}$ (+2g to allow variety on texture controlled diets).

4. **Total Fat**

Current recommendations of dietary fat intake for the general population are the same as for individuals with diabetes, 20-35% of total energy.¹ The risk of cardiovascular disease (CVD) is two to three times higher in individuals with diabetes than those who do not have diabetes. Due to this increased risk the CPG's suggest saturated fats should be limited to $<7\%$ of total daily intake (Grade D).¹ Currently, the STD diet averages 8.5% saturated fats. The review group deems this acceptable considering the percentage of patients that are malnourished and/ or eating poorly in hospital.

Omega-3

Omega-3 fatty acids from fish oils do not show an effect on glycemic control however they do improve lipid profiles, modify platelet aggregation and decrease cardiovascular mortality in individuals with diabetes.^{1,9} Current research supports the recommendation to consume at least two servings/week of oily fish (300-500 mg of EPA and DHA), for secondary prevention of CVD.⁵⁻⁸ Flax consumption (20 – 50 g or 2 – 5 Tbsp/day) can modestly reduce total and LDL cholesterol (Grade B). Some guidelines also recommend consumption of 2g/day of alpha-linolenic acid from food sources (i.e. canola, soybean oils, margarines, seeds and nuts) in addition to omega-3 fatty acid food sources for secondary prevention of CVD.^{10,11} For inpatient setting the goal is to offer fish twice per week (preferably fatty fish).

Recent meta-analyses have not demonstrated a consistent benefit of omega-3 fatty acid oral supplements for secondary CVD prevention.^{1,5}

5. **Fibre**

Soluble dietary fibre slows gastric emptying and delays absorption of glucose in the small intestine improving BG control.¹ Diets high in fibre are also associated with a decreased risk of CVD.¹ Current Healthy Eating Guidelines encourage individuals to consume whole grains, oats, fruits and vegetables, barley, beans, peas or lentils as they have been associated with lower risk factors for CVD⁵ (Grade A). CPG's suggest a higher intake of fibre than the general population, 25-50grams/day or 15 to 25 grams per 1000 kcals.¹ With increased fibre intake, adequate fluid intake and mobility is also required. Rapidly increasing fibre without adequate fluid intake and decreased mobility may result in adverse gastro-intestinal effects. The Diabetes Expert Review Group recommendation is to provide the lower end of the range of dietary fibre per day to reduce unwanted side effects. Fibre rich foods are available to meet additional needs/requests for increased fibre. Need for increased dietary fibre should be assessed on an individual basis.

6. **Alternate sweeteners**

Ace-K, aspartame, cyclamate, neotame, saccharin, steviol glycosides, sucralose, tagatose and thaumatin have been approved by Health Canada as either table top sweeteners or food additives.¹ Cyclamates were previously contraindicated in pregnancy, however are now considered safe, with a caution not to exceed the acceptable daily intake (ADI). Since ADI is based on body weight, no cyclamates will be used to eliminate the risk of exceeding the ADI. (For example 2 packages of sodium-cyclamate based sweeteners would exceed the RDI for a 50 Kg person).¹²

7. **Vitamins and Minerals**

People with diabetes should be encouraged to meet their nutritional needs by consuming a well-balanced diet following *Eating Well with Canada's Food Guide*.¹ Routine vitamin and mineral supplementation is not usually recommended.¹ Special considerations include; vitamin D supplementation (400 IU) for people >50

years of age, and folic acid (0.4 to 1.0 mg) for women who may become pregnant.¹ The need for vitamin and mineral supplementation should be assessed on an individual basis.

8. **Long-term Care Considerations**

In the long-term care population, there is a high risk for weight loss, sarcopenia and functional decline, thus the priority for these residents is different than those in the acute care setting.¹¹ There is good evidence to support that a “diabetic diet” is of limited benefit in this population.¹³ The *Standard (Regular) 70 Plus Years* diet is recommended for residents with diabetes in a Long-Term Care facility. Upon admission, a Registered Dietitian will assess all residents of Long Term Care and will determine appropriate diet based on individualized needs.

9. **Pregnancy**

The goal is to monitor and keep metabolic parameters (e.g. rate of weight gain, blood glucose, ketones, triglycerides) within recommended limits.^{1,14} Hypocaloric diets are not recommended, as they result in weight loss and significant ketosis and are likely inadequate in required nutrients, such as protein and calcium.¹ Pre-pregnancy body mass is a potent predictor of birth weight and should be considered when making recommendations about energy intake and rate of weight gain.^{1,14} The CPGs suggest meal planning should emphasize moderate carbohydrate restriction and distribution over 3 meals and 3 snacks, one of which should be at bedtime^{1,14} (Grade D).

Anticipated Impact:

- Compliant desserts will be ≤ 20g CHO (+2) per serving

Practice Changes:

- Name change for residents with diabetes in Long-Term Care will be *Standard (Regular) 70 Plus Years*

Summary:

- All controlled CHO diets will be compliant with recommendations made in the CDA 2013 CPG's with the exception of saturated fat.
- Further modification to the diet may be made based on RD assessment

Diets Included in the Review:

Controlled CHO	2018: Standard Diet with Controlled Carbohydrate restrictions
Controlled CHO/snacks	2018: as above with HS snack of 15-30 grams carbohydrate and approx. 200 kcalories
Controlled CHO/gestational/snack	2018: Perinatal Diet with Controlled Carbohydrate restrictions

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These recommendations have been reviewed by:

Jillian Paulmark RD, CDE	Approved without edits Oct 7, 2016
Dr. Isanne Schacter, MD, FRCPC Assistant Professor, Endocrinology and Metabolism Program Director, Endocrinology and Metabolism email: isanne.schacter@gmail.com	I've reviewed the document, and it looks great to me. I have no specific edits, but just a general comment that potentially dessert need not be a mandatory portion of the diet. I think that is a relatively philosophical stance though, and I'm ok if it remains included.