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SEMDSA 2017 Guidelines for the Management of Type 2 diabetes mellitus

SEMDSA Type 2 Diabetes Guidelines Expert Committee.

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SEMDSA GUIDELINES

Chapter 6: Medical Nutrition Therapy

SEMDSA Type 2 Diabetes Guideline Expert Committee

SEMDSA 2017 Recommendations for Medical Nutrition Therapy	
Medical nutritional therapy (MNT) has been shown to reduce HbA_{1c} by 0.5 – 2 % in type 2 diabetes	A
Intensive lifestyle interventions, with structured programs focusing on MNT, physical activity and behaviour change with ongoing support, can achieve modest weight loss and improve outcomes in overweight and obese individuals with diabetes and prediabetes. These interventions must be made available to people with type 2 diabetes.	A
There is no ideal percentage of calories from carbohydrates, fat or protein; macronutrient distribution must be individualised.	B
Nutritional approaches must be individualised, based on metabolic goals and a holistic assessment of the individual that is sensitive to, and respectful of, the ethnic, cultural and socio-economic needs of the person. MNT is best delivered by a registered dietitian.	C
Generic nutritional messages (e.g. food plates, handing out pamphlets of "foods allowed and foods to avoid") lack efficacy.	B
The overall quality and sustainability of any dietary approach needs to be considered.	A
A variety of different dietary approaches have been shown to be effective in diabetes management, and current evidence does not suggest that any one single nutrition approach offers greater improvements in glycaemic control or weight loss.	C
Carbohydrate intake (both quality and quantity) should be individualised and guided by the patient's glycaemic control. Carbohydrates from whole grains, legumes, milk, vegetables and fruit should be used instead of refined carbohydrates with added sugar, fats and sodium.	B
The type of fat consumed may be more important than the total fat intake for determining metabolic goals and preventing cardiovascular disease. Monounsaturated fats are preferred to saturated fats. Foods rich in long-chain omega-3 fatty acids, such as fatty fish, nuts and seeds is recommended to prevent cardiovascular disease. The intake of processed meats and fatty red meats should be limited.	B
Intensive lifestyle interventions using a nutritional approach that limits energy from fat (< 30%) and saturated fat (<10%), increases fibre (>15g/1000 kcal) and promotes whole grain, unrefined carbohydrates instead of refined carbohydrates, has proven long-term benefit, efficacy and safety in preventing type 2 diabetes. (Refer to Chapter 27)	A
The long-term safety (cardiovascular and other) of high saturated fat diets, high protein diets or very low calorie diets is not known. This information must be communicated to individuals wishing to adopt this nutritional plan.	C
If the patient decides to consume alcohol it should be in moderation (1 unit per day for women and 2 units per day for men).	C
For general health, sodium intake should be < 2300 mg a day.	B
Do not recommend dietary or vitamin supplements in the absence of proven deficiencies. There is no role for omega-3 supplements.	A

6.1 Introduction

Medical nutritional therapy (MNT) is a vital aspect of both diabetes prevention and diabetes management. A review of the evidence of MNT in the management of type 2 diabetes has shown an HbA_{1c} reduction of 0.5 to 2%.[1]

The objectives of MNT are to promote the enjoyment of a variety of nutrient dense foods in appropriate portion sizes to:

- Achieve individual glycaemic, blood pressure and lipid goals.
- Achieve and maintain body weight goals
- Delay or prevent complications of diabetes.[1]

Glycaemic control can improve despite no weight loss.[2] Thus, the effects of MNT on glycaemic control goes beyond just weight loss. Despite the former, even with 5-10 % weight loss there are marked improvements in metabolic markers.[3] It should however be noted that these metabolic changes improved even more so with ≥ 15 % weight loss.[3] Due to the improvements in metabolic markers, MNT can be-cost saving.[1]

6.2 An Evidence based Nutritional Approach

Despite the benefits associated with MNT, lack of adherence is a common problem. One of the possible explanations is the approach provided by health professionals. Providing patients with generic nutritional advice does not constitute MNT, but rather describes the control arm of large studies which offer no improvements in metabolic markers.[4] Based on the lack of efficacy associated with generic nutritional messages e.g. food plates, handing out pamphlets of "foods allowed and foods to avoid"- these should be avoided as they are not a substitute for comprehensive MNT. Often vitamins, minerals, herbs and spices are marketed as having clinical benefits for people with diabetes. There is however no evidence to support the use of such products and thus should not be included in the MNT.[1] MNT should consist of regular contact sessions with a registered dietitian (RD) preferably experienced in diabetes management (see Table I).[1] The RD should assess the patient and provide individualized nutrition and behaviour modification education during regular monitoring sessions (see Table 1).

6.3 Different Dietary Approaches for the Management of Diabetes

A variety of different dietary approaches have shown to be effective in diabetes management including, low fat diets, low glycaemic index diets, low carbohydrate diets and Mediterranean diets.[11] Evidence at this point does not suggest that any dietary approach offers greater weight loss or improvements in

Table I: Characteristics of effective MNT [1, 5 -12]

Contact sessions: A series of 3-4 encounters with a RD lasting from 45-90 minutes. This should start at diagnosis and should be completed within 3-6 months. The RD should determine whether additional encounters are needed. At least an annual follow up is recommended for reinforcement, monitoring and evaluation of outcomes.
Assessment: Age, gender, anthropometric measurements, weight history, associated conditions, glycaemic control, nutrition history (24- hour recall & food frequency questionnaire), economic status, lifestyle factors (e.g. work logistics), cultural eating patterns, activity pattern, psychological and cognitive factors impacting on eating behaviour, level of literacy, use of medication and supplements.
Education: Acquiring good nutritional knowledge is the first step towards change. Patients need to develop an understanding of food composition, classification, how nutrients influence weight status, glycaemic control and associated conditions. The former serves to empower patients to make informed food choices. Patients often know what to do, but find it difficult to apply the knowledge practically to achieve positive outcomes. Patients require practical tools such as a personalized, practical eating plan, 7-day-cycle menu, and a shopping list that meets the family's lifestyle, culture, socio-economic status and food preferences. It is important to maintain the pleasure of eating by providing positive messages about food.
Monitoring: Monitoring sessions provide accountability and assist the patient to formulate solutions to their barriers to adherence. The tools dietitians use includes; The 5 A's approach (ask, assess, assist, advice and arrange), goal setting, self-monitoring (food diaries), cognitive restructuring, relapse prevention, incentives, motivational interviewing and modelling. Problem solving together with positive feedback and reinforcement enhance the patient's level of self-efficacy, which is important to create and sustain healthy eating habits.

Table II: Characteristics of a High-Quality Dietary Pattern[1, 14-28]

Food	Nutrient and health benefits / Consequences
High intake of fruit and vegetables: Minimum of 5 portions per day	Increase intake of fibre that enhance satiety, Phyto-nutrients, vitamins and minerals that combat oxidative stress.
Starchy foods should be wholegrain: Corn, barley, pearl-wheat, rolled oats, unrefined maize, wild/brown rice and wholegrain breads	Contain B vitamins, vitamin E and fibre that improve glycaemic control and enhance satiety.
Encourage intake of all types of fish: Especially fatty fish with a high omega 3 content such as sardines	Low saturated fat content, good source of protein, omega 3-fatty acids, selenium, magnesium and vitamin D
Encourage intake of legumes: Soya beans, a variety of dry beans, lentils and chick peas	Promote healthy lipid profile, good source of fibre and protein
Use of low fat sugar free daily products: Low fat plain yoghurt and low fat milk	Provide calcium, vitamin D, and magnesium. Good source of protein with a low saturated fat content
Use of vegetable fats: Such as nuts and seeds, avocado pear, olives, plant oils (canola, olive, sunflower etc. Avoid tropical oils (e.g. coconut and palm cornel oil)	Replace saturated fatty acids in the diet with unsaturated fatty acids tend to reduce the risk of cardiovascular disease (CVD). Tropical oils contain LDL cholesterol raising fatty acids
Reduce intake of commercially hydrogenated fats: Commercially deep fried foods, fast foods and baked items contain high amounts of trans fatty acids	Trans fatty acids raise total and LDL cholesterol, decrease HDL cholesterol and increase inflammation.
Reduce intake of processed meats and fatty red meat: Bacon, all types of sausages, polony and deli meats.	High content of salt, nitrates, haem-iron and saturated fat.
Reduce intake of sugars: Table sugar, honey, sugar sweetened beverages, fruit juices, sweets, desserts and baked goods	Poor nutrient content, contributes to poor glycaemic control, lipid profiles, obesity and inflammation.
If alcohol is consumed it should be in moderation: Wine, spirits, beer etc.	A high intake aggravates glycaemic control, hypertension and triglycerides.

glycaemic control.[11] Low carbohydrate high fat diets require special attention due to their increasing popularity. A recent critical review of 9 meta-analyses was the first review to evaluate actual carbohydrate intake at the final follow up.[13] The results indicated no significant difference in metabolic markers between high and low carbohydrate diets. Very low carbohydrate diets (< 50 g a day) were not adhered to as the mean carbohydrate intake of such diets ranged from 132 – 162 g per day. No study included in this review advocated an increased intake of saturated fats, and thus to recommend such a dietary approach would be inconsistent with the research on low carbohydrate diets.[13]

6.4 Nutritional Quality and Dietary Pattern

Despite the lack of superiority of any dietary approach, the overall quality of the prescribed eating plan needs to be considered (see Table 2). The synergistic effect from a variety of nutrients reduces the risk of developing complications associated with diabetes.[14]

6.5 Nutrient Intake

See Table 3 for a brief overview of the recommendations for specific calorie and nutrient intakes.

6.6 Provision of Healthy Food to South Africans

Emerging research suggests the environment influences dietary intake.[39] In South Africa 64.5% of women considered the cost of food when buying groceries.[40] In contrast, nutritional content and overall health were considered by only 14.1% and 14.3% of women respectively.[40] South Africans consume a diet low in fruit and vegetables and high in fat, sugar and other refined carbohydrates such as mealie meal and both white and brown bread.[40,41] A possible reason for this poor food consumption could be the high perceived-cost of healthy foods and lack of knowledge.[41] Unless healthy food items are made available at an affordable price, education alone is unlikely to succeed in curbing national rates of obesity and type 2 diabetes. Thus, the SEMDSA Guidelines for MNT agree with the South African

Table III: Recommended Nutrient Intakes

Nutrient	Recommendations
Calorie Restriction	• For overweight/ obese adults reducing total energy intake (including carbohydrates, fat, protein and alcohol) is vital to promote weight loss[29] • Calorie requirement should be individualised and calculated by a registered dietitian[29] • A reduction of 350 – 500 kcal from maintenance requirements for patients with a BMI of 30 – 34 kg/m^2 and 500 – 1000 kcal for patients with a BMI ≥40 kg/m^2 in theory should result in a 10% weight loss over 6 months[30] • Very low calorie diets (<800 kcal a day) have shown to be very effective in patients with diabetes, over 8 – 12 weeks under medical supervision[31-34] • To achieve modest weight loss, an intensive lifestyle intervention (MNT, physical activity, behaviour modification with ongoing support is recommended[1]
Macronutrient Distribution	• There is no ideal percentage of calories from carbohydrates, fat or protein[11] • Intake should be individualised based on an assessment of the patient (see Table I) taking in consideration the patient's lifestyle and metabolic goals[1, 12]
Carbohydrates	• Monitoring / regulating carbohydrate intake remains a key strategy for glycaemic control[1] • Carbohydrate intake (both quality and quantity) should be individualised and guided by the patient's glycaemic control[1, 12, 13, 35] • Carbohydrates from whole grains, legumes, low fat milk, vegetables and fruit should be used instead of refined carbohydrates and carbohydrates with added sugar, fats and sodium[1, 28, 36, 37] • Sugars (including fructose powder and high fructose corn syrup) should be ideally < 5 % of total energy intake per day to improve overall health. This equates to the sugar found in commercially products e.g. sauces, without adding additional sugar to the diet[38] • The use of non -nutritive sweeteners (NNS) may reduce overall calorie and carbohydrate intake if substituted for caloric sweeteners. NNS are considered safe if used within the acceptable daily intake levels[1] • Often vitamins, minerals, herbs and spices are marketed as having clinical benefits for people with diabetes. There is however no evidence to support the use of such products and thus should not be included in the MNT[1]
Fats	• The type of fat consumed (saturated fat, monounsaturated fat and polyunsaturated fat) may be more important than total fat intake to prevent CVD[1, 27, 36, 37] • Trans fatty acids should be avoided as far as possible[1,18,25,27] • Replacing saturated fat with either monounsaturated fats or polyunsaturated fats tends to decrease the risk for CVD[36, 37] • Replacing refined carbohydrates with monounsaturated fats or polyunsaturated fats tend to decrease the risk for CVD[36, 37] • Saturated fat and refined carbohydrates tend to have a similar risk for CVD. However, replacing saturated fat with wholegrains tends to lower the risk[36, 37] • A minimum of two servings of fatty fish per week is recommended to ensure an adequate intake of long chain omega 3 fatty acids (EPA and DHA) which reduces risk factors for CVD[1]
Protein	• For individuals with type 2 diabetes with normal renal function, there is no evidence to suggest that the usual recommended protein intake should be modified • For adults with micro and macro albuminuria reducing protein intake to <0.8 g per kg / ideal body weight is not recommended. The former does not alter glycaemia, cardiovascular risk factors or the rate of glomerular filtration (GFR) decline.
Alcohol	• If the patient decides to consume alcohol it should be in moderation (1 drink a day for women and 2 for men)[1] • Alcohol may increase the risk of hypoglycaemia when used in combination with secretagogues and / or insulin. Patients need to be educated on how to consume alcohol safely[1]
Salt	• For general health sodium intake, should be < 2300 mg a day[1] • Further reductions in sodium intake may need to be individualised[1]

National Obesity campaign to create an enabling environment that supports the availability and accessibility to healthy food choices in various settings.

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