A Self-management Guide for Type 2 Diabetes Mellitus Patients from Middle Eastern Countries

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“He sent them forth to preach the Kingdom of God,
and to heal the sick.”

Luke 9:2

To my father, who suffers from diabetes mellitus

To my mother

To my wife and children

And to all the diabetic patients who have not received the minimum education about diabetes and its treatment ...
I dedicate my humble work to them...

Ehab

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PREFACE

Diabetes mellitus is a serious chronic disease that is becoming more common, especially in Middle East countries such as Iraq. Diabetes can cause many complications such as eye, kidney, nerve, and heart damage. Learning how to practice diabetes self-management (healthy eating, physical activity, blood glucose monitoring, taking medications, solving diabetes problems, reducing diabetes risks, and healthy coping with stress) is the cornerstone of managing diabetes and preventing such complications. Therefore, all diabetic patients need to be educated about diabetes self-management practices. Unfortunately, such education is still below the required level for most Iraqi diabetic patients.

Despite the availability of many handbooks related to diabetes self-management, not one of these books was designed to take into consideration the lifestyle and culture of Iraqi diabetic patients.

This diabetes self-management guide covers all the common and important parts of diabetes self-management according to the latest guidelines adopted by the American Diabetes Association and the American Association of Diabetes Educators. It is intended to give more than the bare bullet points of diabetes self-management, teaching in a simple way using lay language and many examples from the Iraqi culture. Thus, this diabetes self-management guide is highly useful not only for Iraqi health care professionals (physicians, pharmacists, and nurses) who are training in diabetes care but also for healthcare professionals who are involved in managing diabetic patients in Middle East countries.

CHAPTER ONE

HEALTHY EATING

Healthy eating

One of the most important non-pharmacological treatments of diabetes is dietary modification or what is called nutritional therapy. Nutritional therapy can improve the blood glucose (sugar) level and also has a positive impact by reducing body weight, blood pressure, and lipid levels. Thus, it reduces the risk of diabetes complications (kidney failure, heart disease, nerve damage, and visual problems). Unfortunately, nutritional therapy is the most challenging part of the diabetes treatment plan because it requires patients to change their dietary habits. Diabetic patients often feel frustrated or confused by nutritional therapy because they hear or read that they should avoid certain types of foods. Having diabetes doesn't mean giving up favorite foods or not eating in restaurants. In fact, there is nothing that a diabetic patient can't eat, but they need to know how the foods they eat will affect their blood glucose level.

Food elements

The human diet consists of macro- and micronutrients. Macronutrients include three essential elements: carbohydrates, proteins, and fats. They supply the calories required to provide an individual with energy. Micronutrients include vitamins and minerals.

1) Carbohydrates

Carbohydrates are the most important nutrient that influences the blood glucose level after eating a meal because they transform into glucose in the bloodstream within a few hours after their consumption. There are three main types of carbohydrates: starches (sometimes called carbohydrates), fibers (indigestible part of the food), and sugars. Carbohydrates can be found in many foods, including:

A. Foods rich in starch such as:

1. **Whole grains** (Figure 1-1A) such as barley, oats, brown rice, and wheat grain. The whole grain contains all three parts of the plant kernel – the outer layer of bran (rich in fibers, vitamin B, iron, and antioxidants), the inner germ of the plant (rich in vitamin B, minerals, and healthy fats) and the largest part of the kernel called the endosperm (rich in carbohydrates), in contrast to refined grains that retain only the endosperm. Unfortunately, most grain products (such as bread, pasta, noodles, and crackers) in Iraq, Malaysia, the

USA, and most other countries are made from refined, not whole, grains.

2. **Starchy vegetables** (Figure 1-1B) such as potatoes, peas, and corn contain large amounts of carbohydrates. Meanwhile, non-starchy vegetables such as broccoli, lettuce, cabbage, cauliflower, radish rapeseed, mushrooms, onion, green beans, eggplant, pepper, celery, parsley, green leeks, okra, squash, tomatoes, and chili contain very low amounts of carbohydrates.
3. **Legumes (Beans)** (Figure 1-1C) such as white pea beans, lentils, chickpeas, mung peas, fava beans, and dried red beans are rich in carbohydrates.

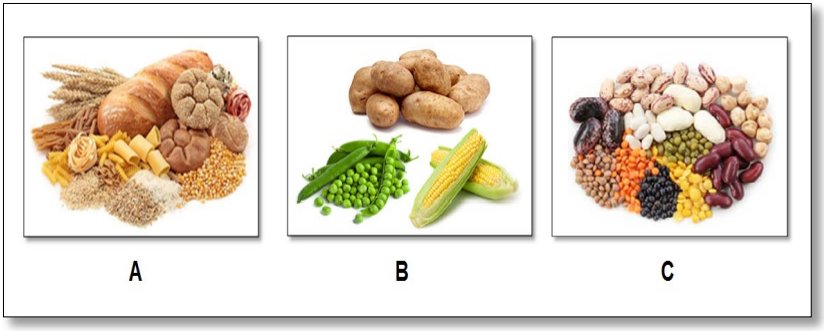

Figure 1-1: Foods rich in starch

B. Foods rich in fibers: such as whole grains, beans, fruits, and vegetables, especially those with edible skin (e.g., cucumber and apple) and even nuts (e.g., almond).

C. Sugars: there are 2 types of sugars

1. Naturally occurring sugars such as lactose, which is found in dairy products (milk and yogurt), and fructose, which is found in fruits (apple, banana, orange, strawberry, kiwi, grape, watermelon, apricot, peach, mango, pomegranate, berry, and pineapple).
2. Non-natural sugars (added sugars) such as sucrose (table sugar), which is usually used during the processing of fruit jam, cookies, chocolates, soft drinks (e.g., Pepsi), biscuits, cake, bagels, and baklava.

Healthy consumption of carbohydrates

To ensure a healthy consumption of carbohydrates, it is recommended for the diabetic patient to:

1. Eat 25 to 30 grams of fibers daily because they are non-digestible, increase the feeling of fullness (satiety) after eating and have the additional benefit of reducing the serum cholesterol level.
2. Increase fiber intake gradually to prevent stomach irritation while increasing the intake of water and other liquids to prevent constipation.
3. Consume at least half of all grains as whole grains because they contain more fiber, vitamins, and minerals than refined grains. Whole grains effectively reduce triglycerides (a type of lipid) level and the risk of cardiovascular diseases; however, there is insufficient evidence to prove the impact of their consumption on reducing the blood glucose level.
4. Include beans in several meals per week since they contain carbohydrates, proteins, fiber, vitamins, and minerals with no or little fat.
5. Eat fresh fruits rather than drink fruit juice because fruits contain fiber.
6. Eat vitamin C-rich fruits such as citrus because hyperglycemia makes the absorption of vitamin C difficult.

Sweets and diabetes

One of the most common misconceptions is that diabetic patients should never eat sweets (sugars) because they will elevate the blood glucose level more than other food types. However, it is the quantity and not the quality of the consumed carbohydrates in a meal that is the primary determinant of the blood glucose level. In other words, one gram of carbohydrates, regardless of its origin (sugar, beans, grains, vegetables or fruits), gives the same number of calories; therefore, monitoring carbohydrate intake, whether by carbohydrate counting or experience-based estimation, remains a key strategy in achieving glycemic control.

There are 2 main reasons why diabetic patients should pay attention while eating sweets:

1. Eating sweets doesn’t produce the same benefits as eating whole grains, fruits, vegetables, and beans since they, in contrast to sweets, are rich in fiber, vitamins, and minerals. Fruits have a

sweet taste because of their fructose content, which is safer than sucrose (a sugar type found in sweets) regarding its impact on blood glucose and triglyceride levels. Therefore, diabetic patients can enjoy sweet treats by eating fruits instead of sweets.

2. Sweets often contain large amounts of fat and calories so eating them can cause weight gain. Therefore, it is better for diabetic patients who want to eat sweets to choose those sweetened with artificial sweeteners (e.g., saccharine, acesulfame, aspartame, and sucralose) instead of sugar because artificial sweeteners have no or fewer calories than sugar. These sweeteners have the potential to reduce overall calorie and carbohydrate intake if substituted for caloric sweeteners, without compensation by the intake of additional calories from other food sources.

Note: Homemade sweets, such as cake, can be prepared using heat-stable sweeteners such as sucralose or acesulfame.

Diabetic patients who want to eat foods containing sugar can substitute the added sugars (e.g., sucrose, high fructose corn syrup, fructose, and glucose) with other carbohydrates as a part of mixed meals up to a maximum of 10% of total daily energy intake (i.e., only small portions of sugar-containing foods can be consumed). This will help the diabetic patient to maintain adequate control of their blood glucose level, lipids, and body weight.

2) Proteins

Proteins have no significant effect on blood glucose levels but they increase insulin response. Proteins are found in the following foods:

1. Red meat, such as beef, lamb (Figure 1-2A), and also pork (non-halal).
2. White meat, such as fish and poultry (e.g., chicken, goose and duck) (Figure 1-2B).
3. Meat substitutes, such as eggs, dairy products, and nuts (Figure 1-2C).

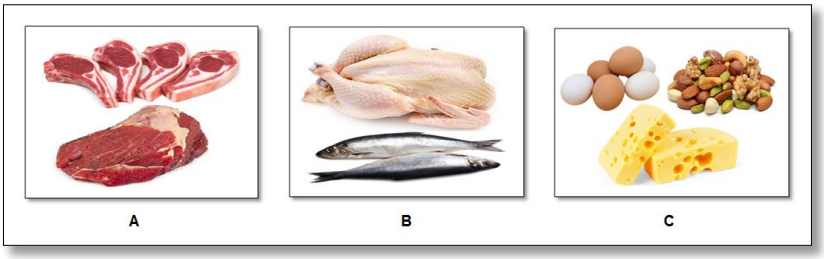

Figure 1-2: Foods rich in proteins

Healthy consumption of proteins

To ensure a healthy consumption of proteins, it is preferred for a diabetic patient to:

1. Eat white meat instead of red meat because it contains lower amounts of fats.
2. Eat fish, particularly fatty fish such as salmon, tuna, sardines, and shrimps, twice weekly because of their omega-3 content, which is useful to reduce the serum triglyceride level and reduce the risks of cardiovascular diseases.
3. Eat high-fat meat and meat substitutes no more than three times per week because they contain high amounts of saturated fats, cholesterol, and calories.
4. Eat no more than 8 eggs per week because of their fat content.
5. Eat egg whites and avoid egg yolks, especially if the diabetic patient suffers from hypercholesterolemia, since the egg yolk contains large amounts of cholesterol.
6. Eat small amounts of non-salted nuts to prevent weight gain because nuts are rich in proteins as well as fats (provide more calories than meat).
7. Avoid reducing the amount of dietary protein below the usual intake (0.8 g of protein/kg of body weight) for diabetic patients with kidney disease.

3) Fats

Fat consumption provides the body with energy, reduces the need for carbohydrates, and may improve glycemic (blood glucose) control when consumed in small to moderate amounts; meanwhile, a large fatty meal can impair glycemic control because an excess of fats can make it more

difficult for the insulin to transfer glucose to cells. On the other hand, the blood glucose level can appear to be in the normal range 2 hours after a large fatty meal and too high 5 hours later; this occurs because fats, unlike carbohydrates, require a longer time (4-6 hours) to be digested. Fats can be classified into:

A. Unsaturated fats (Figure 1-3 A) include:
   1. Monounsaturated fats: found in olive oil, canola oil, avocado, and nuts such as peanuts, cashews, almonds, pistachios, pumpkin seeds, and sesame seeds.
   2. Polyunsaturated fats: found in sunflower oil, maize oil, soybean oil, and flaxseed oil, as well as fish and walnuts.
B. Saturated (non-healthy) fats (Figure 1-3 B): found in full-fat dairy products (full cream milk, butter, cheese, ice cream, and milk cream), chocolate, coconut, coconut milk, and red meat, especially lamb and meat fat.
C. Trans-fats: found in butter, sweets, animal fats, and fried foods (fried chicken, fried potatoes, and chips).

Figure 1-3: Foods rich in fats

Healthy consumption of fats

To ensure a healthy consumption of fats, it is recommended for a diabetic patient to:

1. Consume unsaturated fats instead of saturated and trans-fats to adjust blood glucose levels and reduce the risk of cardiovascular diseases because unsaturated fats are not dangerous to the health of the cardiovascular system. For example, it is better to replace a stick (1/2 ounce) of fatty cheese in a snack with 12 almonds, which give the same energy as cheese but with a healthier quality of fats.
2. Reduce the consumption of fats to less than 30% (~60 g/day) of total daily calories, saturated fats to less than 10% (~20 g/day) of total daily calories, cholesterol to less than 300 mg/day and avoid trans-fats as much as possible to reduce cardiovascular disease risk.

Food supplements

There is a lack of scientific evidence regarding the benefits of vitamin supplements for diabetic patients who don't have a real vitamin deficiency. Food supplements such as multivitamins are only recommended for diabetic patients who are pregnant, breastfeeding, elderly, or vegetarians.

There is insufficient scientific evidence regarding the benefits of antioxidants (beta-carotene, vitamin C and vitamin E) and omega-3 for diabetic patients.

There is also a lack of scientific evidence regarding the benefits of food supplements that contain chromium, magnesium and vitamin D to improve glycemic control.

Spices and herbs for diabetes

Spices include cumin, curry, cinnamon, sumac, pepper (red or black), and ginger. Although scientific evidence proving the effectiveness of spices to control blood glucose is lacking, they are harmless and safe for diabetic patients, so they can consume spices according to their desire with no restrictions.

Regarding herbs, there is also no clear evidence that they can improve glycemic control in diabetic patients but many herbs are incompatible (interact) when used with medications. Therefore, herbs are not recommended for diabetic patients.

Eating patterns

An eating pattern is the foods or groups of foods that a person chooses to eat on a daily basis over time. There are many eating patterns, but the following are the most common:

A. Mediterranean

The Mediterranean eating pattern focuses mostly on plant-based foods like vegetables, fruits, whole grains, cereals, nuts, seeds, beans, and olive oil. This eating pattern also includes a small amount of dairy products, such as cheese and yogurt, as well as fish and poultry. Red meat is limited. Wine can be consumed in small amounts (1-2 glasses of wine per day) with meals. This eating pattern has been shown to protect against heart disease, strokes, and some types of cancers. It may also help improve glycemic control and enable the loss of weight.

B. Dietary approaches to stop hypertension (DASH)

This eating pattern promotes eating more vegetables, fruits, whole grains, nuts, seeds, and lower fat or fat-free dairy products, poultry and fish while limiting foods high in sodium (salt) and saturated fat, red meat, sweets, added sugars, and sugar-sweetened drinks. The DASH diet contains high amounts of fiber and is rich in nutrients, such as potassium, calcium, and magnesium, which may help to lower blood pressure.

C. Vegetarian or vegan

A vegetarian or vegan eating pattern is based mainly on plant-based sources of food, such as vegetables, fruits, whole grains, nuts, seeds, and beans; these foods are rich in vitamins, minerals, and fibers, and lower in saturated fat and cholesterol. Vegetarian eating patterns may be effective in lowering the risks of obesity, heart disease, cancer, and diabetes.

D. Low carbohydrates

A low-carbohydrate eating pattern focuses on the consumption of non-starchy vegetables, proteins, and fatty foods while limiting or avoiding highly processed carbohydrate foods and grains. However, there is no standard for the amount (grams) of carbohydrates in this eating pattern. Additionally, this eating pattern is not practical since it is associated with a higher risk of cardiovascular diseases and impaired glycemic control (see notes above in the fat section) because patients will eat greater amounts of

fat and protein to compensate for the lost energy that results from the reduction of carbohydrate consumption.

E. Low fat

A low-fat eating pattern includes vegetables, fruits, starches, and lean proteins such as chicken and turkey without the skin, fish, and low-fat dairy products. Although this eating pattern has been shown to improve patient health, when overall calorie intake is reduced and weight loss achieved, it doesn't always improve blood glucose or heart disease risk factors.

In summary, eating patterns such as the Mediterranean, DASH, and plant-based diets have proven to be beneficial for diabetic patients through improving glycemic control or at least lowering the risk of cardiovascular diseases. Unfortunately, none of the eating patterns is suitable for all diabetic patients. Additionally, there is no evidence of an ideal percentage of calories from carbohydrate, protein, and fat for all diabetic patients, so eating patterns and macronutrient distribution should be based on patient preferences (e.g., tradition, culture, religion, economics, health beliefs, and goals) and metabolic goals (blood glucose and cholesterol levels).

Healthy eating pattern

Whatever the type of eating pattern followed by the diabetic patient, the following points should be considered to ensure it is healthy:

1. It is recommended to eat foods from a variety of healthy sources such as whole grains, beans, fruits, white meat, vegetables, and unsaturated fats to ensure getting the required amounts of calories, vitamins, minerals, and fiber.
2. It is preferable to prepare most meals at home and use unprocessed ingredients. In this regard, fresh products (fruits and vegetables) are preferred over frozen ones.
3. It is recommended not to consume, or at least to reduce, the intake of canned and fast foods, which are mainly fried, because such foods contain large amounts of calories, which leads to obesity and loss of glycemic control.
4. When choosing canned food, one must examine the food label (see notes at the end of this chapter) to know whether the chosen food is healthy or not. It is better to choose foods that are rich in dietary fibers while avoiding canned foods with large amounts of

fats and trans-fat. Any canned product must be rinsed with water to get rid of the added salts before eating.

5. Diabetic patients must know that “sugar-free” foods may still contain a large amount of carbohydrates. For example, sugar-free apple pie contains carbohydrates from the apples and the crust; sugar-free ice cream contains carbohydrates from the added milk.
6. The daily sodium (salt) intake by diabetic patients must not exceed 2300 mg/day (approximately half a teaspoon), or even less for patients who suffer from hypertension along with diabetes.
7. It is recommended to eat vegetables before fruits because some studies have found that eating vegetables before carbohydrates in a meal improves glycemic control.
8. It is preferable to avoid eating while watching TV or using a computer or mobile phone because when the diabetic patient doesn't pay attention to what and when food is being consumed, it is difficult to control the amount of consumed food. For patients who prefer eating while using media, it is better to avoid eating sweets and share a box of popcorn instead.
9. For eating in restaurants, it is better to choose a small (specifically for children) meal or sandwiches and not to choose meals labeled jumbo or giant or super, because these contain large amounts of calories. Moreover, it is safer to choose meals made with chicken as it contains less fat than red meat. It is also recommended to skip the fries and go for a side salad instead. Additionally, it is better to avoid adding, or add very little, mayonnaise, ketchup or sauce to the meal because of their sugar and/or fat content.

Meal plans

Meal plans are considered guides that help diabetic patients meet their personal weight and blood glucose goals.

Meal plans must include planning for time and the quality and quantity of healthier foods in each meal, while taking into account individual preferences for certain types of food, comorbidities, educational level, and lifestyle (occupation, marital status, and monthly income). Therefore, designing a meal plan for a diabetic patient is best done after consultation with a diabetes educator. Whatever the type of meal plan followed, the following points are highly recommended:

1. Eat three meals per day. Meals should be spaced over waking hours, with no more than 6 hours between one meal and another because long periods without eating can lead to excessive hunger, which can lead to overeating later.
2. Breakfast should not be neglected because it helps to start the process of burning calories that provides the body with the required energy and prevents the liver from converting stored body fats and proteins into glucose.
3. Modifying the diabetic meal plan by including snacks (e.g., a small piece of fruit) between main meals can be done depending on many factors, such as patient preference, the time between meals (e.g., if the time between meals is more than 6 hours) and the possibility of developing hypoglycemia (e.g., exercise and insulin therapy).
4. Scientific evidence indicates that there is no increased risk of weight gain or loss of glycemic control by consumption of a large number of meals during the day (up to 9 meals) if the diabetic patient does not exceed the required daily calories (required calories vary from one diabetic patient to another depending on patient weight, physical activity, diabetes medicines, and glycemic goals). To ensure the daily limit of calories is not exceeded, snacks should not be considered as an additional meal; instead the amount of food in the main meal should be divided into two parts, one part should be taken in the main meal and the other part as a snack.

Commonly used meal plans

Meal plans that are commonly used among diabetic patients include the plate method and the carbohydrate-counting method.

Plate method

This is a simple diabetes meal-planning approach that emphasizes portion control and healthful food choices. This method is also highly suitable for type 2 DM (T2DM) obese patients as it provides a visual guide to controlling calories (by featuring a smaller plate) and carbohydrates (by limiting them to what fits in one-quarter of the plate) and emphasizes low-carbohydrate (or non-starchy) vegetables; so it may reduce body weight as well as control the blood glucose level. This simple method does not require counting calories; therefore, it may be better suited for some older individuals, those with cognitive dysfunction, and those with low health

literacy and numeracy. The plate method is divided into basic and modified plate methods.

Basic plate method

The diabetic patient must follow the following steps to create a meal with the basic plate method:

1. The patient must use a 9-inch (22.8 cm) plate, and then visually divide the plate into 4 quarters (sections) (Figure 1-4).
2. Fill the first section of the plate (1/4 the plate) with starches, the second one with proteins (meat or meat substitutes) and the last section (1/2 the plate) with non-starchy vegetables (can be cooked or raw) (Figure 1-4). However, non-starchy vegetables may not be suitable for breakfast and thus patients can leave 1/2 the plate empty.
3. In general, the amount of food piled on the plate should be about the thickness of the palm of the hand.
4. If a plant-based protein, such as dried beans, was chosen, then one can fill 1/2 of the plate (carbohydrate and protein parts) with cooked legumes since they contain both carbohydrates and proteins.
5. Healthy fats can be used in small amounts. For the purpose of cooking (e.g., vegetable broth), oils such as sunflower or maize oils should be used.
6. For salads, healthy additions include nuts, avocado, spices, and vinaigrettes.
7. On the side of the plate, the patient can put a small piece of fruit or a cup (8 ounces; 240 ml) of low-fat milk (Figure 1–4). Meanwhile, if two hours after a meal the blood glucose level is higher than the desired target, it is better to save the dairy or fruit serving for a snack (3 hours after a meal) instead of consuming it with the main meal.
8. It is possible to increase the amount of starch in a meal if no fruit or milk is added to that meal; however, it is better for the diabetic patient to discuss such cases with the diabetes educator.
9. Other food contents that can be freely added to the meal include water, tea and coffee, but without sugar (artificial sweeteners can be added).

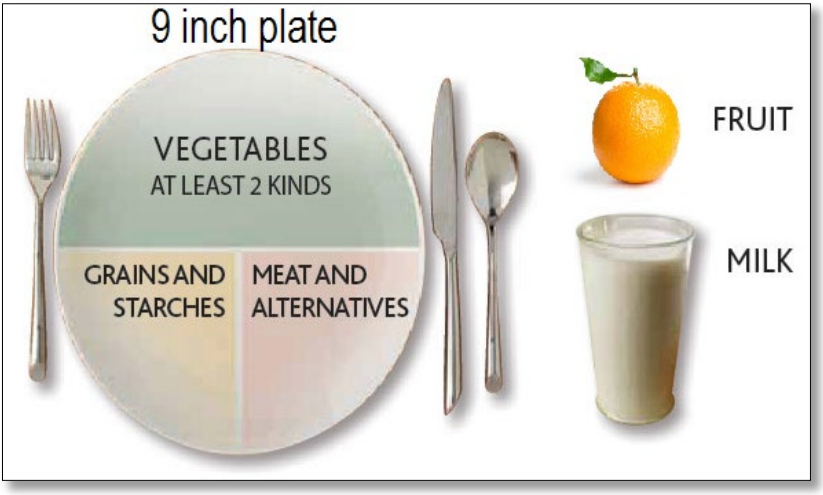

Figure 1-4: Meal planning using the plate method

Modified plate method

Some diabetic patients prefer to use measuring cups to assist with food portion measurement while using the plate method; other patients prefer to use hand or eyeball serving sizes (Table 1-1 and Figure 1-5) to measure food portions rather than measuring cups. This technique of measurement is highly useful when patients are eating away from home.

Table 1-1: Hand approximation for measuring the size of a food portion

Measuring item	Portion size
Palm of hand	3 ounces
Thumb tip (from the tip of the finger to knuckle)	1 teaspoon
Thumb	1 tablespoon
Hand fist, open hand or two hands cupped together	1 cup
One cupped hand	1/2 cup

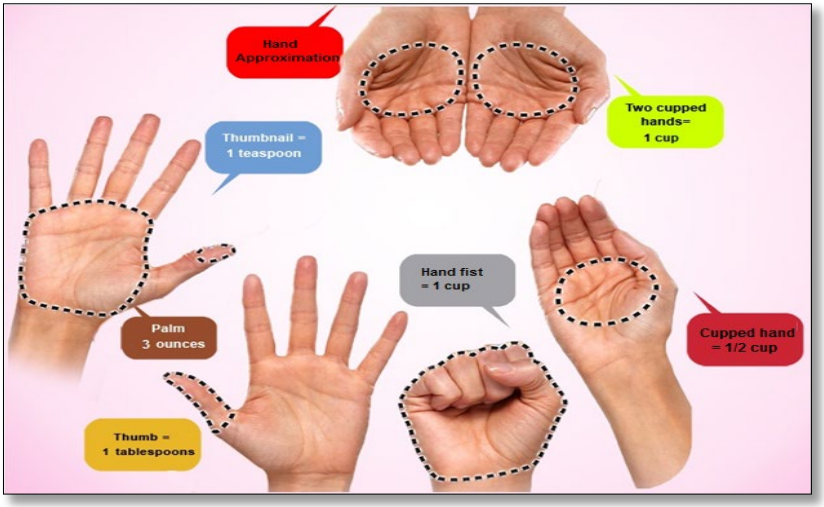

Figure 1-5: Hand approximation for measuring the size of a food portion

Steps to create the meal with the modified plate method

1. Half of the plate should be filled with vegetables by adding two cups of fresh vegetables or one cup of boiled or cooked vegetables (e.g., vegetable broth).
2. One-quarter of the plate should be filled with proteins by adding:
   A. 3 ounces (90 g) piece (~ size of the palm of the hand) of cooked meat, with the knowledge that every 4 oz raw meat (e.g., 1/2 whole chicken breast or 2 chicken legs) can yield 3 oz of cooked meat.
   B. Meat substitutes, such as 2 small eggs, 2 oz (60 g) of low-fat cheese, 1 oz of nuts, or 2 tablespoons of peanut butter, because larger quantities of these meat substitutes contain larger amounts of fats and calories.
3. The last quarter of the plate should be filled with carbohydrates. The exact amount of carbohydrates required to fill 1/4 of the plate is patient-specific (it is better to get diabetes educator consultation) but generally 3–4 servings of carbohydrates per meal is needed (i.e., 1 cup of cooked rice or 3 slices of bread); further details about the size of carbohydrate servings are given in table 1-2.

Application of the plate method for the most popular foods in Iraqi cuisine

1. Lahimbajin

Lahimbajin is a baked piece of flour dough with minced meat (Figure 1-6). If a diabetic patient wants to eat Lahimbajin as a main meal, it is recommended to eat 2 small pieces (9-inch (22.8 cm) diameter) because it contains both meat (as a source of protein) and flour (as a source of carbohydrates). The remaining part of the plate (half of the plate) can be filled with fresh vegetables or healthy salads.

Note: It is recommended to avoid eating super Lahimbajin because with the addition of a fried egg its fat content increases.

Figure 1-6: A piece of Lahimbajin

2. Soups

Soups such as lentil soup or rice soup with meat (Figure 1-7) are common meals worldwide, and especially in Iraqi cuisine. To ensure consumption of proteins and carbohydrates, one can fill 1/2 of the plate with the soup (~2 cups). The other half of the plate can be filled with suitable vegetables, especially onion, or left empty according to desire.

Note: It is recommended to prepare soups with white meat and avoid the addition of Magi® because of its high salt content.

Figure 1-7: Lentil and rice soup

3. Dolma

Dolma is a stuffed vegetable (such as grape leaf, eggplant, tomato, sweet green pepper, or onion) with rice and minced meat (Figure 1-8). It is preferable to fill 1/2 of the plate with the dolma contents (rice and meat) as a source of carbohydrates and proteins. The other half of the plate can be filled with the original vegetable casings or raw vegetables.

Note: It is recommended to prepare dolma using veal instead of lamb because of its lower fat content.

Figure 1-8: Dolma

4. Rice and Kima

Kima is prepared from minced meat with onion and chickpeas (Figure 1-9). It is recommended to fill 1/4 of the plate with rice and chickpeas (as a source of carbohydrates) and 1/4 of the plate with minced meat from the Kima (as a source of protein). The last 1/2 of the plate should be filled with raw vegetables or healthy salads.

Note: It is recommended to prepare the Kima using veal instead of lamb and small amounts of healthy oils.

Figure 1-9: Rice and Kima

5. Kubba

Kubba is a shell made from rice or groats filled with meat (Figure 1-10). It is preferable to fill 1/2 the plate with Kubba since it contains carbohydrates (the shell of rice or groats) and proteins (minced meat) while the other 1/2 of the plate should be filled with raw vegetables or salads.

Note: It is recommended to prepare Kubba with the boiling and not the frying method.

Figure 1-10: Groats shell Kubba

6. Barbecue

The most common barbecues in Iraq are kebab and tikka (Figure 1-11): both can be made from red or white meat. It is preferred to fill the first 1/4 of the plate with 2 small skewers of barbecue (as a source of protein), the second 1/4 of the plate should be filled with bread (a source of carbohydrates), while the last 1/2 of the plate can be filled with vegetables (raw, grilled, or even as salads).

Note: It is not recommended to add lamb fat to the meat.

Figure 1-11: Iraqi barbecues

7. Biryani

Biryani is rice with chicken pieces, meatballs, potato, peas, and almonds (Figure 1-12). It is preferred to fill the first 1/4 of the plate with proteins using biryani contents such as chicken, meat balls and almonds, the second 1/4 of the plate can be filled with carbohydrates using biryani rice, potato and greenpeas, while the remaining half of the plate can be filled with fresh vegetables or salads.

Note: It is preferred to fry the contents of the biryani in small amounts of healthy oils such as sunflower or maize oil.

Figure 1-12: Biryani

8. Tashrib

Tashrib is usually prepared by soaking bread in meat broth (Figure 1-13). It is preferred to fill 1/4 of the plate with the bread (as a source of carbohydrates) soaked in a small amount of meat broth to avoid its high fat content, while the second 1/4 of the plate can be filled with meat (without the skin), and the remaining 1/2 of the plate can be filled with vegetables such as onion, okra and tomato.

Note: Chicken meat is the preferred meat for Tashrib.