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Nutrition in health maintenance

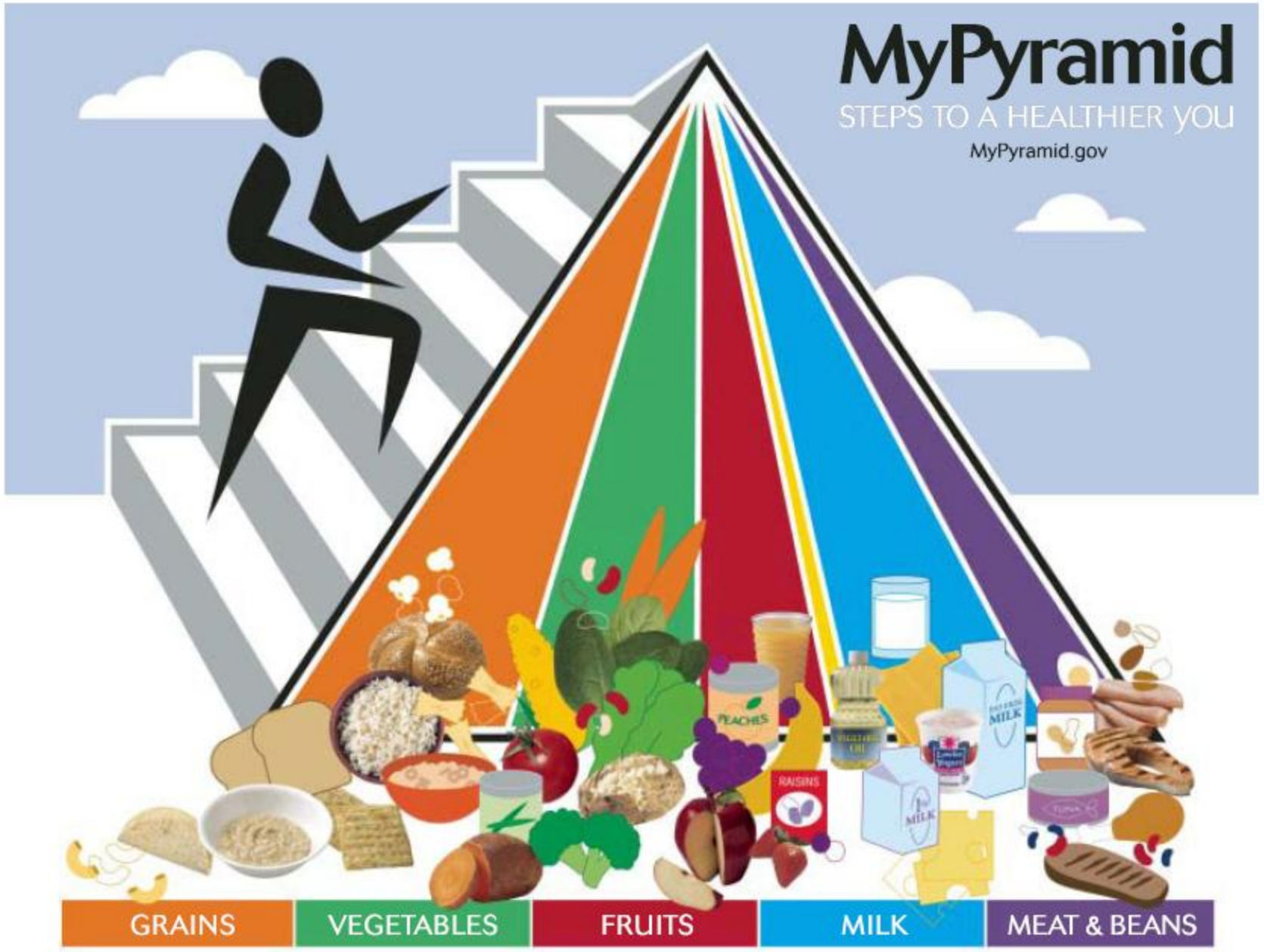
Krzysztof Wróblewski
Dept. of Internal Medicine and Nephrodiabetology,
Medical University of Lodz

UNIWERSYTET MEDYCZNY W ŁODZI

- Diet and nutrition are important factors in the promotion and maintenance of good health throughout the **entire life course**.
- Promoting healthy diets and lifestyles may reduce the global burden of noncommunicable diseases (NCDs)

Ranges of population nutrient intake goals

Dietary factor	Goal (% of total energy, unless otherwise stated)
Total fat	15–30%
Saturated fatty acids	<10%
Polyunsaturated fatty acids (PUFAs)	6–10%
n-6 Polyunsaturated fatty acids (PUFAs)	5–8%
n-3 Polyunsaturated fatty acids (PUFAs)	1–2%
Trans fatty acids	<1%
Monounsaturated fatty acids (MUFAs)	By difference[a]
Total carbohydrate	55–75%[b]
Free sugars[c]	<10%
Protein	10–15%[d]
Cholesterol	<300 mg per day
Sodium chloride (sodium)[e]	<5 g per day (<2 g per day)
Fruits and vegetables	⩾400 g per day
Total dietary fibre	From foods[f]
Non-starch polysaccharides (NSP)	From foods[f]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GRAINS Make half your grains whole	VEGETABLES Vary your veggies	FRUITS Focus on fruits	MILK Get your calcium-rich foods	MEAT & BEANS Go lean with protein
Eat at least 3 oz. of whole-grain cereals, breads, crackers, rice, or pasta every day 1 oz. is about 1 slice of bread, about 1 cup of breakfast cereal, or 1/2 cup of cooked rice, cereal, or pasta	Eat more dark-green veggies like broccoli, spinach, and other dark leafy greens Eat more orange vegetables like carrots and sweetpotatoes Eat more dry beans and peas like pinto beans, kidney beans, and lentils	Eat a variety of fruit Choose fresh, frozen, canned, or dried fruit Go easy on fruit juices	Go low-fat or fat-free when you choose milk, yogurt, and other milk products If you don't or can't consume milk, choose lactose-free products or other calcium sources such as fortified foods and beverages	Choose low-fat or lean meats and poultry Bake it, broil it, or grill it Vary your protein routine — choose more fish, beans, peas, nuts, and seeds
Eat 6 oz. every day	Eat 2 1/2 cups every day	Eat 2 cups every day	Get 3 cups every day; for kids aged 2 to 8, it's 2	Eat 5 1/2 oz. every day

For a 2,000-calorie diet, you need the amounts below from each food group. To find the amounts that are right for you, go to MyPyramid.gov.

Find your balance between food and physical activity

- Be sure to stay within your daily calorie needs.
- Be physically active for at least 30 minutes most days of the week.
- About 60 minutes a day of physical activity may be needed to prevent weight gain.
- For sustaining weight loss, at least 60 to 90 minutes a day of physical activity may be required.
- Children and teenagers should be physically active for 60 minutes every day, or most days.

Know the limits on fats, sugars, and salt (sodium)

- Make most of your fat sources from fish, nuts, and vegetable oils.
- Limit solid fats like butter, margarine, shortening, and lard, as well as foods that contain these.
- Check the Nutrition Facts label to keep saturated fats, *trans* fats, and sodium low.
- Choose food and beverages low in added sugars. Added sugars contribute calories with few, if any, nutrients.

Fat

- Total fat energy of at least 20% is consistent with good health.
- Highly active groups with diets rich in vegetables, legumes, fruits and wholegrain cereals may, however, sustain a total fat intake of up to 35% **without** the risk of unhealthy weight gain.

Free sugars

- Free sugars contribute to the overall energy density of diets.
- Free sugars promote a positive energy balance.
- Diets that are limited in free sugars have been shown to reduce total energy intake and induce weight loss.

- Drinks that are rich in free sugars increase overall energy intake by reducing appetite control. There is thus **less** of a compensatory reduction of food intake after the consumption of high-sugars drinks than when additional foods of equivalent energy content are provided
- Randomized trial showed that when soft drinks rich in free sugars are consumed there is a higher energy intake and a progressive increase in body weight when compared with energy-free drinks

- Children with a high consumption of soft drinks rich in free sugars **are more likely** to be overweight and to gain excess weight

Non-starch polysaccharides (NSP)

- Wholegrain cereals, fruits and vegetables are the preferred sources of non-starch polysaccharides (NSP).
- The benefit of fruits and vegetables cannot be ascribed to a single or mix of nutrients and bioactive substances. This is a food category
- The category of tubers (i.e.potatoes, cassava) should not be included in fruits and vegetables.

- For better health, people of all ages should include a minimum of 30 mins of physical activity of moderate intensity (such as brisk walking) on most, if not all, days of the week.
- Greater health benefits by engaging in physical activity of more vigorous intensity or of longer duration.
- This cardio-respiratory endurance activity should be supplemented with strength-developing exercises at least **twice a week** for adults in order to improve musculo skeletal health

Summary of strength of evidence on factors that might promote or protect against weight gain and obesity[a]

Evidence	Decreased risk	No relationship	Increased risk
Convincing	Regular physical activity High dietary intake of NSP (dietary fibre)[b]		Sedentary lifestyles High intake of energy-dense micronutrient-poor foods[c]
Probable	Home and school environments that support healthy food choices for children[d] Breastfeeding		Heavy marketing of energy-dense foods[d] and fast-food outlets[d] High intake of sugars-sweetened soft drinks and fruit juices Adverse socioeconomic conditions[d] (in developed countries, especially for women)
Possible	Low glycaemic index foods	Protein content of the diet	Large portion sizes High proportion of food prepared outside the home (developed countries) "Rigid restraint/periodic disinhibition" eating patterns
Insufficient	Increased eating frequency		Alcohol

- A high dietary intake of non-starch polysaccharides (NSP)/dietary fibre **(protective).**
- High intake of NSP (dietary fibre) promotes weight loss
- No differences between fibre type or between fibre consumed in food or as supplements, however different level of long-term satiety.

- High intake of energy-dense micronutrient-poor foods (**causative**).
- Energy-dense foods tend to be high in fat (e.g. butter, oils, fried foods), sugars or starch, while energy-dilute foods have a high water content (e.g. fruits and vegetables)

- A variety of popular weight-loss diets that restrict food choices may result in reduced energy intake and short term weight loss in individuals but most do not have trial evidence of long-term effectiveness and nutritional adequacy and therefore **cannot** be recommended for populations *(WHO)*.

- energy from fat **is no more fattening**

etiological factors

- Home and school environments that promote healthy food and activity choices for children (**protective**).

- Heavy marketing of fast-food outlets and energy-dense, micronutrien poor foods and beverages (**causative**) – Young children are unable to distinguish programme content from the persuasive intent of ads.

- A high intake of sugars-sweetened beverages (causative)
- Adverse socioeconomic conditions, especially for women in high-income countries (causative).
- Breastfeeding (protective).

Classification of overweight in adults according to BMI[a]

Classification	BMI (kg/m^2)	Risk of comorbidities
Underweight	<18.5	Low (but risk of other clinical problems increased)
Normal range	18.5–24.9	Average
Overweight	⩾25.0	
Pre-obese	25.0–29.9	Increased
Obese class I	30.0–34.9	Moderate
Obese class II	35.0–39.9	Severe
Obese class III	⩾40.0	Very severe

General strategies for obesity prevention

For infants and young children, the main preventive strategies are:

- the promotion of exclusive breastfeeding;
- avoiding the use of added sugars and starches when feeding formula;
- instructing mothers to accept their child's ability to regulate energy
- intake rather than feeding until the plate is empty;
- assuring the appropriate micronutrient intake needed to promote optimal linear growth.

For children and adolescents, prevention of obesity implies the need to:

- promote an active lifestyle;
- limit television viewing;
- promote the intake of fruits and vegetables;
- restrict the intake of energy-dense, micronutrient-poor foods (e.g. packaged snacks);
- restrict the intake of sugars-sweetened soft drinks.

GI

- A numerical index given to a carbohydrate-rich food that is based on the average increase in blood glucose levels occurring after the food is eaten.

- The glycemic index of a food is defined as the area under the two hour blood glucose response curve (AUC) following the ingestion of a fixed portion of carbohydrate (usually 50 g). The AUC of the test food is divided by the AUC of the standard (either glucose or white bread, giving two different definitions) and multiplied by 100.

Classification	GI range	Examples
Low GI	55 or less	most fruits and vegetables (except potatoes and watermelon), grainy breads, pasta, legumes/pulses, milk, yogurt, products extremely low in carbohydrates (some cheeses, nuts), fructose
Medium GI	56–69	whole wheat products, basmati rice, sweet potato, table sugar
High GI	70 and above	corn flakes, rice krispies, baked potatoes, watermelon, croissants, white bread, extruded breakfast cereals, most white rices (e.g. jasmine), straight glucose (100)

Limitations and criticisms

- The GI does not take into account other factors besides glycemic response, such as insulin response
- The GI is significantly altered by the type of food, its ripeness, processing, the length of storage, cooking methods, and its variety (white potatoes are a notable example, ranging from moderate to very high GI even within the same variety)
- The glycemic response is different from one person to another, and even in the same person from day to day

- The number of grams of carbohydrate impacts blood sugar levels more than the GI. A food with a low GI may have a high carbohydrate content or vice versa;
- Most of the values on the GI do not show the impact on glucose levels after two hours. Some diabetics may still have elevated levels after four hours.
- The GI of foods is determined under experimental conditions after an overnight fast, and might not apply to foods consumed later during the day

GL

- The glycemic load (GL) is a ranking system for carbohydrate content in food portions based on their glycemic index (GI) and the portion size. Glycemic load or GL combines both the quality and quantity of carbohydrate in one ‘number’.
- The best way to predict blood glucose values of different types and amounts of food.

Food	Glycemic index	Carbohydrate content (by weight)	Glycemic Load	Insulin index[7][8][9]
Baguette, white, plain (France)	95	50%	48	—
Banana, Mean of 10 studies	52	20%	10	81
Carrots, Mean of 4 studies	47	7.5%	3.5	—
Corn tortilla (Mexican)	52	48%	25	—
Potato, Mean of 5 studies	50	19%	9.3	121
Rice, boiled white, mean of 12 studies	64	24%	15.4	79
Watermelon	72	5%	3.6	—