

# Maryland State Department of Health and Mental Hygiene

## Diet Manual

**Revised March, 2001**

This manual is intended as a reference to guide nutritional care and menu planning within the DHMH facilities. DHMH strives to provide all patients a diet of optimal nutrient composition, as well as provide food in an attractive and palatable manner.

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# **Chapter 1. Nutrition Assessment**

## **Purpose**

The nutritional assessment is performed to evaluate nutritional status and determine nutrient requirements. Medical, social and diet histories, physical examination, and laboratory values are used to estimate nutrient requirements. The medical history includes age, sex and diagnoses, as well as other pertinent information, such as surgical history, oral and gastrointestinal function, level of physical activity and history of alcohol or substance use. Psychosocial information, such as education, economic status, living arrangements, and ability to purchase food and prepare meals, determines the diet instruction strategy that will be most successful for the patient.

## **Diet History**

Diet history includes appetite, usual pattern of eating, type of food consumed, where meals are consumed, irregularities in chewing or swallowing, and changes in appetite or taste. Food allergy, food intolerance, and food preferences are recorded. Use of medications, vitamin and mineral supplements, and herbal remedies is assessed for the possibility of food/drug interactions.

## **Physical Examination**

The physical examination includes anthropometric data and physical indicators of nutritional status. Anthropometric information includes, at minimum, height and weight. Other assessments of body composition, such as skinfold thickness and upper arm circumference, can be obtained to assess body fat and muscle stores. A table of physical indicators of nutrient deficiencies follows.

There are several methods for measuring height. Self-reporting of height should not be accepted. For patients able to stand, height should be measured upright on the vertical surface of the measuring stick attached to a balance scale. The top of the stick should sit on the patient's head, forming a right angle. For patients unable to stand, or who have excessive spinal curvature, arm span or knee height can be used to estimate a height.

Arm span is measured with the both arms extended at right angles to the body. The tape or anthropometer is extended between the tips of the middle fingers, passing over the clavicles. Alternately, the distance from mid sternum to the tip of the middle of one index finger can be doubled. Arm span is equivalent to stature in young and middle aged adults. In the elderly, it is an estimate of maximum stature at maturity, before stature is lost from age-related bone loss.

Knee height is measured using a broad blade caliper, with the patient lying supine and the left knee bent at a 90° angle. The fixed blade of the caliper is placed under the heel, and the other blade is placed over the anterior surface of the thigh, proximal to the patella, with the caliper shaft parallel to the shaft of the tibia. The measurement is converted to stature as follows:

- Male stature (cm) = [2.02 x knee height (cm)] – (0.04 x age) + 64.19
- Female stature (cm) = [1.83 x knee height (cm) – (0.24 x age) + 84.88

Weight should be measured on a beam scale with non-detachable weights. Scales should be calibrated at 3-4 month intervals. Self-reporting of current weight should not be accepted; however, the patient should be asked about his/her usual weight and any recent history of weight fluctuation.

The combination of height and weight provides the basis for an initial assessment of body composition. Methods for assessing ideal body weight, suggested weight ranges and morbidity risk in the general population are described below:

1. Hamwi Formula—“rule of thumb” estimation of Ideal Body Weight (IBW)  
 Female IBW = 100 lbs. for a height of 5 ft. + 5 lbs. for every inch over 5 ft.  
 Male IBW = 106 lbs. for a height of 5 ft. + 6 lbs. for every inch over 5 ft.  
 A suggested weight range can be calculated by adding and subtracting 10% from the IBW.
2. Body Mass Index (BMI)—useful in assessing body composition and health risk

$$\text{BMI} = \frac{\text{weight (kg)}}{\text{height}^2 \text{ (m)}}$$

OR

$$\frac{\text{weight (lbs)} \times 705}{\text{height}^2 \text{ (in)}}$$

BMI <18 underweight  
 BMI 18-24.9 normal weight  
 BMI 25-29.9 overweight

BMI 30-34.9 obese class I  
 BMI 35-39.9 obese class II  
 BMI ≥ 40.0 extreme obesity (III)

3. 1983 Metropolitan Height and Weight Tables\*:

**Desirable Weights for Women**

Height	Small Frame (lbs)	Medium Frame (lbs)	Large Frame (lbs)
4'10"	102-111	109-121	118-131
4'11"	103-113	111-123	120-134
5'0"	104-115	113-126	122-137
5'1"	106-118	115-129	125-140
5'2"	108-121	118-132	128-143
5'3"	111-124	121-135	131-147
5'4"	114-127	124-138	134-151
5'5"	117-130	127-141	137-155
5'6"	120-133	130-144	140-159
5'7"	123-136	133-147	143-163
5'8"	126-139	136-150	146-167
5'9"	129-142	139-153	149-170
5'10"	132-145	142-156	152-173
5'11"	135-148	145-159	155-176
6'0"	138-151	148-162	158-179

### Desirable Weights for Men

Height	Small Frame (lbs)	Medium Frame (lbs)	Large Frame (lbs)
5'2"	128-134	131-141	138-150
5'3"	130-136	133-143	140-153
5'4"	132-138	135-145	142-156
5'5"	134-140	137-148	144-160
5'6"	136-142	139-151	146-164
5'7"	138-145	142-154	149-168
5'8"	140-148	145-157	152-172
5'9"	142-151	148-160	155-176
5'10"	144-154	151-163	158-180
5'11"	146-157	154-166	161-184
6'0"	149-160	157-170	164-188
6'1"	152-164	160-174	168-192
6'2"	155-168	164-178	172-197
6'3"	158-172	167-182	176-202
6'4"	162-176	171-187	181-207

\*SOURCE: Metropolitan Life Insurance Co.; data adapted from the 1979 Build Study, Society of Actuaries and Association of Life Insurance Medical Directors of America. Philadelphia: Recording and Statistical Corp., 1980. Weights at ages 25-59 based on lowest mortality. Weight in pounds according to frame size with indoor clothing and shoes with 1" heels.

The percentage of ideal body weight can be calculated as follows:

$$\% \text{ IBW} = \frac{\text{current weight}}{\text{ideal weight}} \times 100, \text{ where}$$

>120% IBW is suggestive of obesity, <90% IBW may indicate risk for malnutrition.

The percentage of weight change can be calculated as follows:

$$\% \text{ Weight Change} = \frac{\text{usual weight} - \text{current weight}}{\text{usual weight}} \times 100$$

#### Significant Weight Loss

- 1-2% in one week
- 5% in one month
- 7.5% in three months
- 10% in six months

#### Severe Weight Loss

- >2% in one week
- >5% in one month
- >7.5% in three months
- >10% in six months

For patients with amputations, IBW is adjusted for missing body parts.  
 $IBW = [(100 - \% \text{ for body part lost})/100] \times IBW \text{ for original height.}$

<u>Body Part</u>	<u>% of Total Body Weight</u>
Hand (1)	0.8%
Hand and forearm (1)	3.0%
Entire Upper Extremity	6.5%
Foot (1)	1.8%
Foot and Lower Leg to knee (1)	7.0%
Entire Lower Extremity	18.5%
Below knee-mid calf (1)	5.8%
Above knee-mid thigh (1)	15.5%

<b>Physical Finding</b>	<b>Potential Nutrient Deficiency</b>
Hair: Thinning, Dull, Brittle, Easily pluckable	Protein
Eyes: Pale conjunctivae Wrinkling and dryness of the Conjunctiva, white plaques on the Conjunctiva (Bitot's spots) Angular inflammation of the eyelid, Mild conjunctivitis	Anemia (iron, folate, or B <sub>12</sub> ) Vitamin A  Riboflavin
Mouth: Redness of lips, tongue, mouth Swollen or bleeding gums, loose teeth Glossitis Angular stomatitis Cheilosis	Niacin Vitamin C Folic acid Niacin, iron, and folate Riboflavin, niacin, iron, and pyridoxine
Skin: Pallor Scaling, Dryness Petechiae, bruising Decreased wound healing	Anemia (iron, folate) Vitamin A, essential fatty acids Vitamin C, vitamin K Zinc, vitamin C, protein
Nails: Brittle, ridged, spoon-shaped	Iron

### **Biochemical Evaluation**

Certain laboratory tests are strongly associated with nutritional status. Significant deviation from normal ranges can indicate a need for diet modification. The following laboratory tests are recommended on admission and periodically, as needed for re-assessment: serum glucose (fasting), blood urea nitrogen (BUN/SUN), creatinine, electrolytes, total protein, albumin, liver function tests (LFTs), cholesterol, triglycerides, and complete blood count (CBC).



## Assessment of Nutrient Needs

In adults, energy (caloric) requirement is calculated using the Harris Benedict Equation. The formula uses height, weight and age to calculate basal energy expenditure (BEE).

Females:  $BEE = 655.1 + (9.6 \times \text{wt in kg}) + (1.8 \times \text{ht in cm}) - (4.7 \times \text{age in years})$

Males:  $BEE = 66.5 + (13.8 \times \text{wt in kg}) + (5.0 \times \text{ht in cm}) - (6.8 \times \text{age in years})$

For the obese patient, use adjusted body weight (125% of IBW) in the calculation.

BEE is multiplied by activity and injury factors to complete the energy requirement.

$$BEE \times \text{Activity Factor} \times \text{Injury Factor} = \text{Total Energy Expenditure}$$

### Activity Factor

Confined to bed = 1.2

Out of bed/light activity = 1.3

Moderate activity = 1.4

Active = 1.5

Strenuous activity = 2.0

### Injury Factor

Infection = 1.0 - 1.8

Surgery = 1.0 - 1.2

Fever =  $1.0 + 0.13 \text{ per } ^\circ\text{C over normal}$

Skeletal trauma = 1.2 - 1.35

Head injury = 1.15 - 1.6

Burns = 1.0 - 1.85

An additional 300 calories per day is added during pregnancy, and 500 calories per day during lactation.

Protein requirements for healthy people have been estimated by the National Research Council (see appendix). The protein requirement for healthy, well nourished individuals is 0.8 grams/kg body weight. The requirement increases to 1.5 to 2.0 grams/kg body weight with fever, fracture, infection, and wound healing, with up to 3 grams/kg body weight with burns. Protein requirements may be either increased or decreased with impaired renal or liver function, depending upon function and medical therapy. For the obese patient, adjusted body weight as calculated above should be used to calculate protein requirements.

The Dietary Reference Intake (DRI) and the Recommended Dietary Allowances (RDA) are generally used as a guide for micronutrient requirements (see appendix), with supplementation as clinically indicated.

The requirement for fluid in adults is 30-40 cc per kg body weight per day, with additional needs of 500 to 1500 cc or more per day if the patient has a fever, diarrhea, vomiting, excessive sweating, or a draining fistula. Fluid restriction may be indicated for patients with renal disease, congestive heart failure, or hyponatremia. For patients with extremes in body weight, fluid requirements can be estimated as follows: 100 cc per kg for the first 10 kg, 50 cc per kg for the next 10 kg, and 15 cc per kg for the remaining kg of actual body weight.

### **Nutritional Assessment of the School Age Child and Adolescent**

In addition to present weight and height, the assessment of growth is crucial to the nutritional assessment of children and adolescents. The growth charts developed by the National Center for Health Statistics, and recently revised in collaboration with the National Center for Chronic Disease Prevention and Health Promotion are widely used to assess the height and weight of children through age 20 (see appendix). Use of these curves to assess weight-for-height is limited to the pre-pubescent period. However, body mass index is now the recommended measure to determine if children are overweight. The calculated body mass index is compared to the percentile values in the newly developed growth charts. "Overweight" is defined as Body Mass Index (BMI) greater than the 95th percentile for age, and "at risk" is defined as BMI between the 85th and 95th percentile for age.

Nutrient requirements of children and adolescents are highly variable due to the wide variability of growth rates, the timing of growth spurts, and level of physical activity. Thus, the use of the DRI and RDA, particularly for energy and protein, can only be a starting point in a thorough assessment on nutrient requirements (see appendix). Other means by which to estimate energy requirements include the use of FAO/WHO recommendations, which include requirements for growth and activity, or the Harris Benedict equation as described above, multiplied by a factor to cover additional kcal for growth and activity, usually 1.6 to 1.7.

## Chapter 2. General Diets

### Regular Diet

**Purpose:** The regular diet is designed to provide adequate nutrients for healthy individuals.

**Use:** The diet is used to promote good health and nutritional status.

**Modifications:** There are no major categories of modification. Menu selection based on recommendations in the Dietary Guidelines for Americans and the Food Guide Pyramid (see appendix) reduces risk of major nutrition-related diseases.

#### **Related**

**Physiology:** There is an established and increasing body of scientific knowledge that connects nutrition and lifestyle to wellness. Individual foods and their relative proportion in the diet provide major categories of nutrients and the setting for their interaction. Recommended Dietary Allowances (RDA), Dietary Reference Intakes (DRI) and tolerable upper levels (UL) of vitamins and minerals are established by the Food and Nutrition Board of the National Academies of Science (see appendix).

A diet planned according to the Dietary Guidelines for Americans, along with other healthy lifestyle decisions, can help prevent or delay the onset of serious diseases (diabetes, cancer, heart disease, stroke, diverticulosis), minimize risk factors for disease (hypertension, obesity) and prevent dental and ophthalmic degeneration.

**Adequacy:** The diet is adequate in kilocalories and nutrients for most healthy adult individuals. Young and/or very active individuals may need additional kilocalories. Pregnant women require vitamin/mineral supplementation and an additional serving from the milk group.

## Regular Diet Foods

	Allowed	Avoided
Beverages	Water, tea, coffee, flavored beverages (naturally or artificially sweetened)	Frequent use of high calorie beverages sweetened with sugar/corn syrup
Breads/cereal	Whole grain and enriched breads, bagels, biscuits, crackers, muffins, tortillas, pancakes, waffles, croissants, pastries, doughnuts, corn chips	Frequent use of high fat breads (biscuits, waffles, croissants, pastries, doughnuts, corn chips) and sugared cereals
Desserts	Cake, cookies, pie, gelatin, cobbler, dessert bars, ice cream, sherbet, pudding. Choose desserts with low or moderate fat and sugar content frequently	Frequent use of desserts with high fat/sugar content (whole milk pudding, ice cream, iced rich cake, pie crust)
Fats	Butter, margarine, cream, whipped topping, cooking fats/oils, gravy, mayonnaise, salad dressing, bacon, nuts, olives, cream cheese	Use of lard and hydrogenated shortening in cooking; frequent use of butter/cream in recipes
Fruits	Canned, cooked, fresh or dried fruit; fruit juice. Include citrus or vitamin C-fortified juice or assure another source of vitamin C daily	Frequent use of canned fruit packed in heavy syrup, sweetened fruit juice
Meat or equivalent	Meat, fish, poultry, soybean or tofu entrees, dried beans/peas/lentils, peanut butter, cheese, cottage cheese, eggs and egg substitute. Use of lean meat is recommended	Frequent use of high fat/fried meats (luncheon meat, brisket, spare ribs, sausage)
Milk or equivalent	Milk, yogurt, cheese, cottage cheese, pudding (counts as ½ serving). Two to three servings planned as beverage, entrée or dessert are recommended daily to meet calcium needs. Non-fat or low fat dairy products are recommended	Frequent use of high fat dairy products (whole or 2% milk, full-fat cottage cheese, ice cream, pudding made with whole milk)
Potato or alternate	Baked or cooked white/sweet potato, potato salad, potato chips, rice, pasta, noodles	Frequent use of high fat recipes (frying, cream or cheese sauces), potato chips
Soups	Bouillon; broth-based soups containing meat, fish, vegetables, beans, noodles or pasta; chowder; cream soups	Frequent use of soups with high meat fat content or high fat dairy products
Vegetables	Any, raw or cooked, prepared as desired. Include a leafy green/yellow-orange source of vitamin A 3-4 times per week	Frequent high fat preparation (frying, recipes using cheese, whole milk, cream)
Condiments/miscellaneous	Honey, sugar, sugar substitute, salt, pepper, mustard, ketchup, jelly, syrup, tartar/cocktail sauce, soy sauce, coconut/nuts/ seeds/ fried onion/fried noodles used as garnish	None

**Sample Menu**

Breakfast	Lunch	Supper
4 oz juice	2 oz Roast pork with gravy	6 oz Beef Stroganoff
$\frac{3}{4}$ cup rice krispies	Medium baked potato	$\frac{1}{2}$ cup bow tie noodles
2 pancakes	$\frac{1}{2}$ cup broccoli slaw	$\frac{1}{2}$ cup cooked carrots
2 tsp margarine	Cornbread square	biscuit
2 tbsp syrup	2 tsp margarine	2 tsp margarine
8 oz milk	$\frac{1}{2}$ cup sliced peaches	iced cake square
8 oz coffee or tea	8 oz milk	8 oz coffee or tea/creamer, as desired
2 tsp sugar	salt and pepper	1 tsp sugar
salt and pepper		salt and pepper

## Regular Pediatric Diet

**Purpose:** This regular pediatric diet is designed to meet the nutrient requirements of children and adolescents between 6 and 18 years of age, without medical or nutritional conditions requiring a modified diet.

### Related

**Physiology:** Rapid physical growth and high activity levels characterize childhood. The diet should provide adequate nutrients for optimal growth and development as well as for the storage of nutrients in preparation for adolescence, and promote healthy eating habits.

Adolescence is characterized by very rapid physical growth and development. The growing independence and schedules of children in this age group make the provision of adequate nutrients a challenge. Teenagers frequently have unstructured eating habits that include missed meals, fast food, and “junk food” snacks that often replace meals. The prevalence of dieting by adolescent females often results in the avoidance of meat and dairy products and can compromise overall health and nutritional status. Given these factors, the dietary intake of iron, calcium, riboflavin, and vitamins A and C may be inadequate.

**Adequacy:** The regular pediatric diet as planned will meet the nutrient requirements for The population. Menus are formulated to provide 2000-2300 kcal for the 6-11 year old age group, and 2300-3000 kcal for the 11-18 year old age group, and to ensure nutrient adequacy except for the pregnant or lactating adolescent female. In these cases dietary modification would be required, since nutrient requirements far exceed the regular adolescent diet.

### Sample Menu

Breakfast	Lunch	Supper	Snacks
Apple Juice-4 oz Corn flakes-1 oz Fried egg-1 ea W/cheese-1/2 oz Whole-wheat toast-2 sl 1% Milk-8 oz	Roast beef-2-3 oz Mashed potatoes-4 oz Broccoli-4 oz Split top roll-1 ea Margarine-1 t. Applesauce-4 oz 1% Milk-8 oz	Cheese pizza-1 sl (cheese-2 oz) Tossed salad-1 cup Low fat dressing-1 oz White grapes-3 oz Oatmeal cookie-1 ea 1% Milk-8 oz	PM Low fat yogurt-8 oz Juice-8 oz  HS Pretzels-1 bag 1% Milk-8 oz

## High Fiber Diet

- Purpose:** The high fiber diet is designed to promote beneficial physiologic or metabolic effects by adding foods with a high insoluble and soluble fiber content.
- Use:** The diet is used primarily for its physiologic benefit in preventing constipation, diverticular disease, inflammatory bowel disease (IBD), and colon cancer. Fiber also provides a feeling of satiety, that can positively affect weight reduction/control, thereby providing associated benefits in the management of diabetes, hypertension and hyperlipidemia. Since plant fibers are usually a mixture of soluble and insoluble fibers, the high fiber diet may have an additional benefit of lowering of serum cholesterol.
- Modifications:** The diet emphasizes fiber-containing foods, such as fruits, vegetables, legumes and whole-grain or minimally refined breads and cereals. Bran may be added to refined cereals to increase fiber content.

### Related

**Physiology:** Fiber, the undigestible carbohydrate residue of plant foods, increases stool transit time and stool bulk by absorbing water. Soluble and insoluble fibers can normalize bowel function and decrease discomfort in IBD and diverticular disease. Wheat bran, an insoluble fiber, is highly effective in reducing constipation, but may cause discomfort initially or when large amounts are used. Insoluble fiber can alleviate constipation without the discomfort of pressure in the colon.

The cholesterol-lowering effects of soluble fiber possibly result from the ability of fiber to bind bile acids. Depletion of the bile acid pool removes cholesterol from serum for bile acid synthesis. Colonic fermentation of soluble fiber also produces short-chain fatty acids that decrease hepatic cholesterol synthesis.

Fiber does not independently aid in weight loss management; however, the substitution of calorie-dense low fiber foods with higher fiber foods can enhance the feeling of satiety while reducing calorie intake. In part, this is achieved on calculated weight reduction diets by substituting fruit exchanges for high calorie desserts and eliminating low fiber calorie-dense foods or ingredients, such as gravy, salad dressing, and coatings for frying. The dietary fiber recommendation for adults is 20-35g/day.

Although some soluble fibers inhibit the absorption of glucose from the small intestine, the clinical significance is insignificant. There is no independent recommendation to increase fiber for the diabetic population as a whole. For patients with hyperlipidemia, 6-10g of soluble fiber/day is recommended with a 3:1 ratio of soluble to insoluble fiber.

**Adequacy:** With modest increases in fiber, the diet is adequate in all nutrients for most healthy adults. Excessive intake of some fiber sources may bind or limit absorption of calcium, copper, iron, magnesium, selenium or zinc, although there appears to be a long-term adaptive response to a high fiber intake. Limiting fiber intake to 35g from a variety of sources and drinking adequate amounts of fluid will minimize the risk of nutrient imbalance in most healthy adults.



### High Fiber Diet Foods

	Allowed	Avoided
Beverages	As desired	None
Breads/cereal	Whole grain or minimally processed breads and cereals; bran cereals, oatmeal, shredded wheat, wheat germ. Wheat bran or oat bran may be added to refined cereals	Refined breads and cereals, such as white bread, cream of wheat, cream of rice
Desserts	As desired. It is recommended that low fiber cakes, cookies or pastries be replaced with fruit or a whole grain dessert at least once a day	More than one low fiber dessert per day
Fats	As desired	None
Fruits	Two or more servings daily, fresh or cooked/canned at meals or snacks	None
Meat or equivalent	As desired. Emphasis on dried peas, beans and lentils as excellent sources of soluble fiber	None
Milk or equivalent	Milk, yogurt, cheese, cottage cheese. Two to three servings are recommended daily to meet calcium needs	None
Potato or alternate	As desired. Emphasis on white or sweet potato with skin and whole grains, such as brown rice	None
Soups	As desired. Emphasis on soups containing peas, beans, lentils and vegetables	None
Vegetables	As desired, raw or cooked, especially with skin	None
Condiments/ miscellaneous	As desired	None

### Sample Menu

Breakfast	Lunch	Supper
4 oz juice	2 oz roast pork with gravy	6 oz Beef Stroganoff
$\frac{3}{4}$ cup shredded wheat	Medium baked potato with skin	$\frac{1}{2}$ cup barley
hard-cooked egg	$\frac{1}{2}$ cup broccoli slaw	$\frac{1}{2}$ cup cooked carrots
2 small bran muffins	Cornbread square	2 slices whole grain bread
2 tsp margarine	2 tsp margarine	2 tsp margarine
8 oz milk	$\frac{1}{2}$ cup sliced peaches	whole grain fruit bar
8 oz coffee or tea	8 oz milk	8 oz coffee or tea/creamer, as desired
2 tsp sugar	salt and pepper	1 tsp sugar
salt and pepper		salt and pepper

## Vegetarian Diet

**Purpose:** The vegetarian diet is designed to exclude specific animal products, usually those that result from practices which are lethal or harmful to the animal.

**Use:** The diet is used when individuals choose to eliminate animal products from the diet. Typical reasons for choosing vegetarianism are religious practice, concerns about the environment or the ethics and safety of food production, lifestyle change in alliance with political/economic ideology, and concerns about health.

**Modifications:** All vegetarian diets exclude some animal foods. The choice of foods to exclude usually results from a religious or personal belief system. Some individuals who partially restrict animal flesh foods still call themselves vegetarian. Usually red meats are restricted first, then poultry and/or fish and seafood. All traditional vegetarian diets restrict animal foods that take the life of the animal. Some include animal products that do not require killing.

Lacto-ovovegetarian	Excludes meat, poultry and seafood.
Lactovegetarian	Excludes meat, poultry, seafood and eggs. This is a traditional Hindu diet that includes dairy products.
Ovovegetarian	Excludes meat, poultry, seafood and dairy products. It includes eggs.
Vegan	Excludes all foods from animal sources (meat, poultry, seafood, eggs, and dairy products).

### Related

**Physiology:** Vegetarian diets are typically lower than meat-based diets in fat, saturated fat and cholesterol, and higher in folate, antioxidants, phytochemicals and fiber. Reduction in fat and cholesterol combined with an increase in folate and soluble fiber has been associated with improvement in coronary artery disease. The abundance of folate, antioxidants, phytochemicals and fiber and decrease in fat has been associated with decreased incidence of and mortality from several types of cancer (colorectal, lung and breast). Vegetarians often consume more complex carbohydrate and fewer calories than individuals on meat-based diets. The resulting decrease in body mass index is associated with reduced incidence of hypertension and type 2 diabetes and decreased morbidity. Individuals who choose vegetarian diets may also make other beneficial lifestyle changes, such as abstaining from tobacco and alcohol and increasing exercise.

**Adequacy:** Vegetarian diets can be nutritionally adequate if a wide variety of foods, including some from animal sources, are consumed. As individual foods or categories of foods are restricted, there is increasing risk for nutrient deficiency without careful attention to meal planning, use of fortified foods or vitamin/mineral supplementation. A table of good food sources of nutrients that are of concern to vegetarians follows this section.

**Calories:** Vegetarian diets that are lowest in fat are most likely to be low in calories. The abundant fiber content of plant foods increases satiety, which can moderate caloric intake. Vegans and ovovegetarians are most at risk. Calories can be increased with the inclusion of nuts, seeds, avocados, full-fat soy products and vegetable oils in cooking or salad dressings. Caloric needs are greater for pregnant and lactating women and during periods of illness.

**Protein:** Intake of protein will be adequate when a variety of plant foods is consumed. Sources of complementary amino acids equivalent to complete protein do not have to be consumed at the same meal to be beneficial. A variety of amino acid sources throughout the day is adequate to promote nitrogen retention in healthy individuals.

**Iron, zinc and calcium:** Vegetarian diets are generally adequate in these nutrients. With the exception of egg yolk, which contains heme iron, vegetarians obtain iron all or mostly as non-heme iron. Non-heme iron is not as well absorbed as heme iron, but the high vitamin C content of many plant foods can increase absorption. Body iron stores may be lower in vegetarians. The phytate content of unrefined high fiber foods diminishes zinc absorption; however, the greater zinc content of whole grains, compared to refined flours, results in adequate total absorption of zinc. Vegetarians who do not consume dairy products can meet calcium needs from plant sources and calcium-fortified foods. The relatively lower protein and sodium content of vegetarian diets, compared to meat-based diets, has a calcium-sparing effect.

**Vitamin D:** The main dietary sources of vitamin D are fortified dairy products. All individuals can meet vitamin D requirements 5-15 minutes of daily sun to hands, arms and face (Darker skin, cloudy or smoggy environments and winters in northern latitudes may increase exposure requirements). Vegetarians who do not eat dairy products can meet requirements by consuming soymilk or cereal fortified with vitamin D.

**Vitamin B<sub>12</sub>:** Plant foods are not a reliable source of vitamin B<sub>12</sub>. Dairy products and eggs are good sources of vitamin B<sub>12</sub>. The vitamin is also recycled in the body. Vegans can obtain vitamin B<sub>12</sub> from fortified foods or direct supplementation. A vitamin B<sub>12</sub> supplement is recommended for all older vegetarians, since absorption diminishes with age.

Essential fatty acids (EFA): Vegetarians who do not consume eggs or fish have no direct source of eicosapentaenoic (EPA) and docosahexaenoic (DHA) acids. The EFA alpha-linolenic acid can be converted to these long chain omega-3 fatty acids (EPA & DHA); however, typical diets in the U.S. are high in linoleic acid, which limits the conversion. Vegetarians can assure EFA adequacy by limiting saturated fat and trans-fat, choosing monounsaturated fat as the principal fat source, minimizing the use of oils high in linoleic acid (omega-6 fatty acids) and including sources of alpha-linolenic acid (omega-3 fatty acids).

Monounsaturated

olive oil  
 canola oil  
 peanut oil  
 avocado  
 olives  
 hazelnuts  
 pistachios  
 almonds  
 macadamia nuts  
 peanuts  
 pecans

Omega-6

corn oil  
 sunflower oil  
 safflower oil  
 cottonseed oil  
 (margarine, salad  
 dressing or mayonnaise  
 made with these oils)

Omega-3

flaxseed oil  
 ground flaxseed  
 walnut oil  
 walnuts  
 canola oil  
 linseed oil  
 soybean oil  
 full-fat soybeans  
 full-fat tofu

## Vegetarian Food Sources of Nutrients

<b>Iron</b>	<b>mg</b>	<b>Calcium</b>	<b>mg</b>
<b>Breads, cereals, and grains</b>		<b>Legumes (1 cup cooked)</b>	
Whole wheat bread, 1 slice	0.9	Chickpeas	78
White bread, 1 slice	0.7	Great northern beans	121
Bran flakes, 1 cup	11.0	Navy beans	128
Cream of wheat, ½ cup cooked	5.5	Pinto beans	82
Oatmeal, instant, 1 packet	6.3	Black beans	103
Wheat germ, 2 tbsp	1.2	Vegetarian baked beans	128
<b>Vegetables (1/2 cup cooked)</b>		<b>Soyfoods</b>	
Beet greens	1.4	Soybeans, 1 cup cooked	175
Sea vegetables	18.1-42.0	Tofu, ½ cup	120-350
Swiss chard	1.9	Tempeh, ½ cup	77
Tomato juice, 1 cup	1.3	Textured vegetable protein, ½ cup	85
Turnip greens	1.5	Soy milk, 1 cup	84
<b>Legumes (1/2 cup cooked)</b>		Soy milk, fortified, 1 cup	250-300
Baked beans, vegetarian	0.74	Soy nuts, ½ cup	252
Black beans	1.8	<b>Nuts and seeds (2 tbsp)</b>	
Garbanzo beans	3.4	Almonds	50
Kidney beans	1.5	almond butter	86
Lentils	3.2	<b>Vegetables (1/2 cup cooked)</b>	
Lima beans	2.2	Bok choy	79
Navy beans	2.5	Broccoli	89
<b>Soyfoods (1/2 cup cooked)</b>		Collard greens	178
Soybeans	4.4	Kale	90
Tempeh	1.8	Mustard greens	75
Tofu	6.6	Turnip greens	125
Soy milk, 1 cup	1.8	<b>Fruits</b>	
<b>Nuts/seeds (2 tbsp)</b>		Dried figs, 5	258
Cashews	1.0	Calcium-fortified orange juice, 1 cup	300
Pumpkin seeds	2.5	<b>Other foods</b>	
Tahini	1.2	Blackstrap molasses, 1 tbsp	187
Sunflower seeds	1.2	Cow's milk, 1 cup	300
<b>Other foods</b>		Yogurt, 1 cup	275-400
Blackstrap molasses, 1 tbsp	3.3	<b>Vitamin D</b>	<b>mcg</b>
<b>Zinc</b>		Fortified ready-to-eat cereal, ¾ cup	1.0-2.5
<b>Bread, grains and cereals</b>		Fortified soy milk or other nondairy milk, 1 cup	1.0-2.5
Bran flakes, 1 cup	5.0	<b>Vitamin B<sub>12</sub></b>	<b>mcg</b>
Wheat germ, 2 tbsp	2.3	Ready-to-eat breakfast cereals, ¾ cup	1.5-6.0
<b>Legumes (1/2 cooked)</b>	2.0	Meat analogs (1 burger or 1 serving according to package)	2.0-7.0
Adzuki beans	2.0	Fortified soy milk or other nondairy milks, 1 cup	0.2-5.0
Chickpeas	1.3	Nutritional yeast (Red Star Vegetarian Support formula, formerly T6635 <sup>a</sup> ), 1 tbsp	4.0
Lima beans	1.0		
Lentils	1.2	<b>Linolenic acid</b>	<b>grams</b>
<b>Soyfoods (1/2 cup cooked)</b>		Flax seed, 2 tbsp	4.3
Soybeans	1.0	Walnuts, 1 oz.	1.9
Tempeh	1.5	Walnut oil, 1 tbsp	1.5
Tofu	1.0	Canola oil, 1 tbsp	1.6
Textured vegetable protein	1.4	Linseed oil, 1 tbsp	7.6
<b>Vegetables (1/2 cup cooked)</b>		Soybean oil, 1 tbsp	0.9
Corn	0.9	Soybeans, ½ cup cooked	0.5
Peas	1.0	Tofu, ½ cup	0.4
Sea vegetables	1.1-2.0		
<b>Dairy foods</b>			
Cow's milk, 1 cup	1.0		
Cheddar cheese, 1 oz.	0.9		
Yogurt, 1 cup	1.8		

## Kosher Diet

- Purpose:** The Kosher diet is designed to meet the Jewish dietary laws of kashrut.
- Use:** The Kosher diet is used when individuals, usually Orthodox Jews, choose to follow the laws of kashrut. Non-Orthodox Jews often choose to follow a much less restrictive version of the diet, usually restricting pork and shellfish and possibly avoiding consumption of meat and dairy products at the same meal.
- Modifications:** The laws of kashrut are extensive. They pertain to food sources (including the slaughter of animals), methods of food preparation, utensils and Jewish holidays. Interpretation of kashrut also varies among Ashkenazi and Sephardic Jews and various Chassidic sects. Practice of kashrut in institutional or commercial food preparation requires the supervision of a mashgiah (a person who is specially trained to supervise a Kosher kitchen).

In the United States, there are four Kosher certification agencies, whose symbols on food products indicate a specific level of adherence to kashrut. Information about these agencies and their symbols is included in this chapter.

DHMH hospitals do not have Kosher kitchens. Meeting the dietary needs of Jewish patients whose observance requires Kosher certified foods can be accomplished by the purchase of frozen Kosher dinners, scrutiny of labels on individually packaged foods (cereal, cookies, fruit juice, milk and other items which can be served unopened), and use of paper and plastic utensils.

### Related

- Physiology:** There are no physiologic associations with the Kosher diet. It is a diet of choice, based on Jewish faith.
- Adequacy:** Because of the inherent limited choice of foods in institutions without Kosher kitchens, there is a risk of decreased or insufficient caloric intake. There are typically no breakfast meals available from commercial vendors. Double servings of accepted foods and snacks can increase calories and satiety at meals. Fresh fruits are usually readily accepted. Orders for formulary nourishments can augment and complement the nutritional profile of the foods that the patient accepts.

Commercial frozen Kosher dinners are not designed to meet the requirements of therapeutic diets. They may also pose a problem for patients with chewing and swallowing problems. Seriously ill patients, whose conditions warrant extensive dietary modification, may have to be transferred to a hospital with a Kosher kitchen if they or their families will not permit the use of some non-Kosher foods.

## Lactose-Controlled Diet

**Purpose:** The lactose-controlled diet is designed to prevent or reduce the symptoms associated with ingesting lactose-containing products. Symptoms of lactose intolerance may include intestinal gas, bloating, cramping and diarrhea.

**Use:** The diet is used for patients with lactose intolerance.

**Modifications:** The lactose-controlled diet minimizes or eliminates foods that contain lactose. Restriction is based on individual tolerance. Strategies that may reduce symptoms of lactose intolerance include consuming smaller portions of lactose-containing foods, consuming lactose-containing foods with other foods, consuming dairy products with reduced levels of lactose (yogurt with active cultures, ripened cheeses, commercial reduced-lactose dairy products), and taking an oral lactase enzyme supplement along with lactose-containing foods.

### Related

**Physiology:** Lactose, the major carbohydrate in cow's milk, is a disaccharide compound of glucose and galactose that is hydrolyzed by the enzyme lactase in the intestinal lumen. Lactase deficiency is categorized as primary, secondary or congenital.

Lactase activity decreases sometime after weaning in primary lactase deficiency. The onset and extent of lactase deficiency and its onset varies with racial or ethnic background. African Americans, Asians, and Native Americans (including Hispanics) may be more genetically predisposed to primary lactase deficiency than Europeans. Individuals with primary lactase deficiency have varied tolerance to lactose and may be able to consume some lactose-containing foods without symptoms. Individual tolerance is usually determined from experience with lactose-containing foods.

Secondary lactase deficiency is a temporary condition that results from damage to the lining of the small intestine where lactase is active. When the condition is resolved, lactose tolerance resumes.

Congenital lactase deficiency is a rare condition in which lactase enzyme is completely absent at birth. Lactose must be completely avoided to avoid unpleasant symptoms.

**Adequacy:** The diet can be planned to meet all nutrient requirements. If all dairy products are eliminated, calcium, vitamin D and riboflavin may be deficient if alternative sources of these nutrients are not provided. Many non-dairy products are now fortified with calcium.



### Lactose-Controlled Diet Foods

	Allowed	Avoided
Beverages	Any that do not contain dairy products	Any containing dairy products
Breads/cereal	Most breads and cereals are tolerated. Sensitive individuals may need to avoid products made with fresh milk or whey	Breads and cereals made with fresh milk or added whey
Desserts	As tolerated	Ice cream, ice milk, sherbet, custard, pudding, cheesecake, if not tolerated
Fats	As tolerated	Cream cheese, if not tolerated
Fruits	Any	None
Meat or equivalent	Any. Recipes prepared with milk, cream, sour cream or cheese as tolerated	Recipes with milk, cream, sour cream or cheese, if not tolerated
Milk or equivalent	Lactase-treated dairy products (Lactaid), fortified soy, rice or barley "milks" Small servings of dairy products as tolerated	Any dairy products not tolerated
Potato or alternate	Any. Recipes prepared with milk, cream, sour cream or cheese as tolerated	Recipes with milk, cream, sour cream or cheese, if not tolerated
Soups	Broth-based soups. Soups with dairy products as tolerated	Soups prepared with dairy products, if not tolerated
Vegetables	Any. Vegetables prepared with milk, cream, sour cream or cheese as tolerated	Vegetables prepared with milk, cream, sour cream or cheese as tolerated
Condiments/miscellaneous	Any that do not contain large amounts of dairy products, including whey	Milk chocolate, caramels, and other products containing milk or whey, if not tolerated

### Sample Menu

Breakfast	Lunch	Supper
4 oz juice (calcium-fortified, if available)	2 oz roast pork with gravy	6 oz Beef Stroganoff
6 oz. cream of wheat	Medium baked potato	½ cup bow tie noodles
8 oz. Yogurt	½ cup broccoli slaw	½ cup cooked carrots
Bagel	Cornbread square	biscuit
2 tsp margarine	2 tsp margarine	2 tsp margarine
8 oz coffee or tea/creamer	½ cup sliced peaches	iced cake square
8 oz coffee or tea	8 oz fruit-ade	8 oz coffee or tea/creamer
2 tsp sugar	salt and pepper	1 tsp sugar
salt and pepper		salt and pepper

## Chapter 3. Modified Consistency Diets

### Clear Liquid Diet

**Purpose:** The clear liquid diet provides residue-free fluids in a form that minimizes digestion and stimulation of the gastrointestinal tract.

**Use:** The diet is intended for short-term use :

- a. To eliminate residue prior to diagnostic testing of the gastrointestinal tract;
- b. To minimize stimulation of the gastrointestinal tract during periods of nausea and vomiting, diarrhea, acute illness or inflammation of the gastrointestinal tract; and
- c. As a transitory diet during the progression from n.p.o. to full oral alimentation after surgery or parenteral nutrition support

**Modifications:** The clear liquid diet consists of clear fluids, foods that become clear liquids at body temperature, and condiments or infusions that can be completely dissolved in liquids (salt, sugar, tea).

#### **Related**

**Physiology:** When there is trauma or disuse of the gastrointestinal tract, there is a decrease in related digestive processes, such as motility, gastric emptying and enzymatic activity. The clear liquid diet is the initial process in restoring gastrointestinal function with minimal trauma or stimulation.

**Adequacy:** The clear liquid diet is inadequate in kilocalories and almost all nutrients. Vitamin C can be adequate with planned selection. The diet typically provides 500-1000 kilocalories per day. It is intended for short-term use. If the diet is indicated for longer than 3 days, a commercially prepared low residue elemental diet or parenteral support should be implemented.

**Clear Liquid Diet Foods**

	Allowed	Avoided
Beverages	Clear fruit juices (apple, cranberry, grape); strained pulp-containing juices (orange, lemon, grapefruit); coffee or tea (black, green or herbal) without dairy products or non-dairy whiteners; clear punch or fruit-ade drinks (ready-to-drink or made from completely dissolved crystals)	Nectars; beverages with pulp or other residue
Soups/broths	Clear strained broth; powdered or cubed bouillon, completely dissolved	Unstrained broth; cream soup
Desserts/sweets	Clear gelatin; Italian (water) ice; popsicles, plain hard candy	sherbet
Condiments	Honey, sugar, sugar substitute, salt	All others
Miscellaneous	Elemental formulas (Vivonex or similar)	All others

**Sample Menu**

Breakfast	Lunch	Supper
8 oz clear or strained juice	8 oz clear or strained juice	8 oz clear or strained juice
4-8 oz gelatin	4-8 oz Italian ice	4 oz each, Italian ice and gelatin
	8 oz clear broth	8 oz clear broth
8 oz coffee or tea	8 oz coffee or tea	8 oz coffee or tea
2-3 sugar packets	2-3 sugar packets	2-3 sugar packets

## Full Liquid Diet

- Purpose:** The full liquid diet provides kilocalories and protein when there is difficulty with chewing, swallowing, or digesting solid food.
- Use:** The diet may be used:
- For mandibular fractures or following oral surgery or plastic surgery of the face or neck area.
  - During acute infection, gastritis, diarrhea or any condition that renders a patient too ill to eat or be fed solid or semi-solid food.
  - When there are strictures or other anatomical abnormalities that prevent swallowing solid/semi-solid food.
  - As a transitional diet following surgery or a period of total parenteral nutrition.
- Modifications:** The full liquid diet consists of foods that are liquid at body temperature and foods that are blenderized to a liquid form. Viscosity can be regulated either by addition of liquid or addition of natural or commercial thickeners. A limited amount of whole foods that can be softened in liquids (such as crackers) may be included, if tolerated.
- Related Physiology:** Surgery, anatomical abnormalities or acute illness may be associated with inability or difficulty in swallowing a bolus of food. Liquids enable a greater variety of food delivery methods and swallowing methods. Straws, syringes and spoons may assist in eating/feeding. Nutrient-dense liquid foods can be readily eaten or fed throughout the day to optimize kilocalorie and protein intake.
- Adequacy:** Because of individual tolerance/acceptance and nutrient requirements, the full liquid diet is likely to be deficient in a number of nutrients, especially iron, vitamin A, and B vitamins. It may not provide adequate kilocalories or protein during severe illness. The diet can be supplemented with commercial formulary nourishments or multi-vitamin and mineral supplements.

**Full Liquid Diet Foods**

	Allowed	Avoided
Beverages	Juices, punch/fruit ades, milk, thin milkshakes, milk drinks, eggnog, chocolate drinks	Thick milk drinks, alcohol
Breads/cereal	Soft bread/crackers that can be blenderized with liquid; cereal gruel	All others
Starches/starchy vegetables	Potatoes; rice or noodles that can be blenderized into liquid form, vegetable juices and vegetables that can be blenderized into liquid drinks or soup; strained/blenderized soups without solid ingredients	All others
Meat or equivalent	Meat, fish, poultry, eggs, beans, cheese or peanut butter that can be blenderized into liquid form	All others
Fruits	Juices, nectars; fruits that can be blenderized into liquid form	Liquids with nuts, coconut, seeds or other solid pieces of food
Fats	Butter, margarine, cream, non-dairy creamers, cooking oil, gravy, whipped topping	All others
Desserts	Thin custard, pudding, ice cream sherbet, Italian (water) ice, gelatin; cakes, cookies or pie that can be blenderized into liquid form	Liquids with nuts, coconut, seeds or other solid pieces of food
Condiments	Honey, syrup, jelly, sugar, sugar substitute, salt	All others

**Sample Menu**

Breakfast	Lunch	Supper
8 oz cereal gruel	8 oz broth	8-10 oz tomato or cream soup
8 oz juice	8 oz juice	8 oz juice
8 oz milk	8 oz gelatin	8 oz ice cream
8 oz coffee or tea	8 oz milk	8 oz milk
3 sugar packs	8 oz coffee or tea	8 oz coffee or tea
	3 sugar packs	3 sugar packs

## Dysphagia Diets

- Purpose:** Dysphagia diets provide adequate nutrients in a consistency that minimizes the risks of choking or aspiration and promotes adequate hydration, weight and nutritional status.
- Use:** Dysphagia diets are indicated whenever there is chewing or swallowing difficulty. Chewing or swallowing impairment can develop in the presence of neuromuscular diseases, anatomical irregularities, tumors and cancer treatments, or after strokes, head injuries or surgery of the head and neck.
- Modifications:** Foods in the dysphagia diet series range from puree to soft, fork-tender whole foods. The food consistency is organized into four categories, with increasing particle size. Consistency of fluids ranges from very thick to partially thickened liquids to regular liquids. Ordinary fluids may be thickened to an appropriate consistency with commercial thickeners, baby cereal, baby apple flakes, potato flakes, pureed foods, gelatin or soft bread crumbs. If patients cannot tolerate thick liquids, foods with inherent high fluid content, such as puree fruits, custard, or water ice can be selected. The diets, Dysphagia I-IV, are described individually.
- Related Physiology:** Elderly patients, especially those in institutionalized settings, are prone to dysphagia as a result of multiple system impairments. Any damage to muscles or nerves used for swallowing can cause dysphagia. Weak tongue or cheek muscles can impair the ability to move food around for chewing and push it to the back of the throat for swallowing. Neurological disorders can impair the swallowing reflex or coughing mechanism. Strictures of the esophagus or weakness of the esophageal wall can cause food to stick, creating a risk for aspiration of remaining food items during periods of rest or sleep. Simple causes of dysphagia include missing or painful teeth and poorly fitting dentures.
- Adequacy:** Since dysphagia can severely impair eating or feeding and greatly prolong the feeding process, there is risk for inadequate intake of kilocalories, protein, vitamins and minerals, and fluids. After choosing a diet with foods of appropriate consistency, high protein foods or foods with concentrated kilocalories can be selected. To assure adequate hydration, liquids are thickened to a viscosity best tolerated by the patient.

## **Dysphagia Diets I-III**

**Purpose:** The dysphagia I/puree and the dysphagia II/ground diets are designed to avoid chewing, in order to minimize swallowing difficulty. The dysphagia III/chopped diet is designed to minimize chewing and swallowing difficulty.

**Use:** The diets are used for patients experiencing chewing and swallowing difficulty. The diet can be used as part of a dysphagia management plan for patients with neuromuscular problems related to stroke, head injury or cancer of the head or neck.

**Modifications:** Dysphagia I/Puree Diet: The diet consists of liquids, smooth-textured semi-liquids, and mashed or pureed solid foods. Sticky or very thick foods that require manipulation of the tongue and lips are excluded.

Dysphagia II/Ground Diet: The diet consists of solid foods, with particle size no greater than 1/8 inch, and liquids, as tolerated. The consistency is equivalent to that of “junior food” in commercial products.

Dysphagia III/Chopped Diet: The diet consists of chopped foods, with particle size of 1/4 to 1/2 inch, some very soft whole foods, and liquids, as tolerated.

### **Related**

**Physiology:** Neurological damage can impair swallowing ability by inhibiting the coordination or individual movements of the facial muscles, lips, tongue or throat. Swallowing difficulty increased the risk of choking or aspiration.

**Adequacy:** The diet is a modification of texture only and parallels the nutritional adequacy of the therapeutic diet it modifies. It can be planned to meet all nutrient requirements. Fiber can be low. Consideration must be given to the time necessary to eat or be fed. Severe impairment can result in underconsumption of kilocalories and nutrients. Additional enteral feeding or vitamin/mineral supplementation may be necessary. Fluid intake should be monitored.

### Dysphagia I/Puree Diet Foods

	Allowed	Avoided
Beverages	As tolerated; beverages may need to be thickened with baby cereal, potato flakes, soft bread crumbs, baby apple flakes, gelatin, puree fruits/vegetables or commercial thickeners	None; use water with caution
Breads/cereal	Soft bread crumbs made from white or wholegrain flour; smooth cooked cereals	Whole seeds; whole grains that are not completely milled; pancakes; rolls; biscuits; sliced bread; waffles; bagels; muffins; cornbread
Desserts	Thin custard, smooth or tapioca pudding, ice cream, sherbet, Italian (water) ice, gelatin, pudding cake (without coconut), smooth pie filling (pumpkin)	Rice pudding, bread pudding, whole cakes, cookies, pie
Fats	Butter, margarine, cream, whipped topping, cooking fats/oils, gravy, mayonnaise, salad dressing without seeds	All others
Fruits	Fruit juice/nectars (thickened as necessary), puree fruit, smooth cranberry sauce, applesauce	All others
Meat or equivalent	Puree meat/poultry/fish, scrambled egg, puree hard-cooked egg, puree casseroles, cheese sauce, puree beans (commercial smooth refried beans), puree cottage cheese, smooth yogurt	All others
Potato or alternate	Mashed white or sweet potato; puree macaroni, noodles, pasta or rice; smooth cooked cereals	All others
Soup	Smooth cream or pureed soups	All others
Vegetables	Puree vegetables, tomato or vegetable juice	All others
Condiments/ miscellaneous	Honey, sugar, sugar substitute, salt, pepper, mustard, ketchup, jelly, syrup	All others

### Sample Menu

Breakfast	Lunch	Supper
4 oz juice	½ cup puree pork with gravy	½ cup puree beef with gravy
6 oz cream of wheat	½ cup mashed potato	½ cup grits
¼ cup scrambled egg	½ cup puree spinach	½ cup puree carrots
½ cup soft bread crumbs	½ cup puree cornbread	½ cup soft whole wheat bread crumbs
1 tsp margarine	1 tsp margarine	1 tsp margarine
1 tbsp jelly	½ cup puree peaches	4 oz sherbet
8 oz milk	8 oz milk	8 oz coffee or tea/creamer, as desired
8 oz coffee or tea	salt and pepper	1 tsp sugar
2 tsp sugar		salt and pepper
Salt and pepper		



## Dysphagia II/Ground Diet Foods

	Allowed	Avoided
Beverages	As tolerated; beverages may need to be thickened with baby cereal, potato flakes, soft bread crumbs, baby apple flakes, gelatin, puree fruits/vegetables or commercial thickeners	None; use water with caution
Breads/cereal	Soft bread crumbs made from white or wholegrain flour; cooked cereals; cold cereals softened in milk	Whole seeds; coarse cold cereals; pancakes; rolls; biscuits; sliced bread; waffles; bagels; muffins; cornbread
Desserts	Custard, pudding, ice cream, sherbet, Italian (water) ice, gelatin, soft cake (without coconut), smooth pie filling (pumpkin), cookies softened in liquid	Coarse cake, dry cookies; desserts made with whole fruits, nuts, or seeds
Fats	Butter, margarine, cream, whipped topping, cooking fats/oils, gravy, mayonnaise, salad dressing without seeds	All others
Fruits	Fruit juices/nectars (thickened as necessary); soft cooked fruit without skin or seeds; very soft peeled fresh fruit; smooth cranberry sauce, applesauce	All others
Meat or equivalent	Ground meat/poultry or flaked fish (especially with added sauce/gravy), scrambled egg, chopped hard-cooked egg, ground casseroles, cheese sauce, coarse puree beans (refried beans), cottage cheese, smooth yogurt, smooth peanut butter, as tolerated	All others
Potato or alternate	Mashed or cooked soft white or sweet potato; finely chopped macaroni, noodles or pasta; rice; cooked cereals	All others
Soup	Smooth cream or pureed soups	All others
Vegetables	Finely chopped or mashed cooked vegetables, cream-style corn, tomato or vegetable juice (thickened as necessary)	Raw vegetables, whole corn
Condiments/ miscellaneous	Honey, sugar, sugar substitute, salt, pepper, mustard, ketchup, jelly, syrup	All others

## Sample Menu

Breakfast	Lunch	Supper
4 oz juice	½ cup ground pork with gravy	½ cup ground beef with gravy
6 oz cream of wheat	½ cup soft boiled potato	½ cup chopped noodles
¼ cup scrambled egg	½ cup chopped spinach	½ cup chopped carrots
½ cup soft bread crumbs	½ cup puree cornbread	½ sup soft whole wheat bread crumbs
1 tsp margarine	1 tsp margarine	1 tsp margarine
1 tbsp jelly	½ cup chopped canned peaches	4 oz sherbet
8 oz milk	8 oz milk	8 oz coffee or tea/creamer, as desired
8 oz coffee or tea	salt and pepper	1 tsp sugar
2 tsp sugar		salt and pepper
salt and pepper		

### Dysphagia III/Chopped Diet Foods

	Allowed	Avoided
Beverages	All, as tolerated	According to tolerance
Breads/cereal	Bread, soft muffins without seeds or nuts, crackers/toast (soften in liquid, as necessary), hot or cold cereals; pancakes, waffles, or French toast with extra syrup	Coarse cold cereals (such as granola), tough breads, such as bagels, English muffins
Desserts	Custard, pudding, ice cream, sherbet, Italian (water) ice, gelatin, soft cake (without coconut); pie without nuts, coconut, or large pieces of fruit; soft moist cookies	Coarse cake, dry cookies; desserts made with whole fruits, nuts, or seeds
Fats	Butter, margarine, cream, whipped topping, cooking fats/oils, gravy, mayonnaise, salad dressing without seeds	All others
Fruits	Fruit juices/nectars (thickened as necessary); cooked/canned fruit without skin or seeds; soft peeled fresh fruit (peeled apple as tolerated); cranberry sauce, applesauce	All others
Meat or equivalent	Chopped meat/poultry or flaked fish (especially with added sauce/gravy), scrambled egg, hard-cooked egg, casseroles with chopped ingredients, cheese sauce, soft beans/refried beans, cottage cheese, yogurt, smooth peanut butter, as tolerated	All others
Potato or alternate	Mashed or cooked soft white or sweet potato; coarsely chopped macaroni, noodles or pasta; rice; cooked cereals	Fried potatoes, potato skins, potato or pasta salads made with large pieces (>½ inch)
Soup	Soups with ingredients no larger than ½ inch	All others
Vegetables	Coarsely chopped or mashed cooked vegetables, cream-style corn, tomato or vegetable juice (thickened as necessary)	Raw vegetables, whole corn
Condiments/ miscellaneous	Honey, sugar, sugar substitute, salt, pepper, mustard, ketchup, jelly, syrup	All others

### Sample Menu

Breakfast	Lunch	Supper
4 oz juice	½ cup chopped pork with gravy	½ cup chopped beef with gravy
¾ cup rice krispies	½ cup soft boiled potato	½ cup chopped noodles
¼ cup scrambled egg	½ cup chopped spinach	½ cup chopped carrots
2 slices toast	cornbread square	biscuit
2 tsp margarine	2 tsp margarine	2 tsp margarine
1 tbsp jelly	½ cup canned peaches	4 oz sherbet
8 oz milk	8 oz milk	8 oz coffee or tea/creamer, as desired
8 oz coffee or tea	salt and pepper	1 tsp sugar
2 tsp sugar		salt and pepper

salt and pepper		
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### **Dysphagia IV/Mechanical Soft Diet**

**Purpose:** The mechanical soft diet is designed to minimize chewing of food prior to swallowing.

**Use:** The diet is used for patients who are partially or completely edentulous, have painful teeth, or are recovering from oral/dental work. The diet can be used as part of a dysphagia management plan for patients with neuromuscular problems related to stroke, head injury or cancer of the head or neck.

**Modifications:** Most whole foods are chopped or ground. Very soft, peeled, seeded raw fruits or vegetables are allowed. Foods containing seeds and pieces of nuts are excluded.

#### **Related**

**Physiology:** Patients who have trouble chewing, because of missing teeth or pain, are at increased risk of choking from attempts to swallow large pieces of food. Patients who avoid foods that are hard to chew are also at increased risk for weight loss and inadequate nutritional status.

**Adequacy:** The diet is a modification of texture only and parallels the nutritional adequacy of the therapeutic diet it modifies. It can be planned to meet all nutrient requirements.

### Dysphagia IV/Mechanical Soft Diet Foods

	Allowed	Avoided
Beverages	As desired	None
Breads/cereal	Any without whole seeds, nuts, coconut	Any containing whole seeds, nuts, coconut
Desserts	Any without whole seeds, nuts, coconut	Any containing whole seed, nuts, coconut, hard cookies
Fats	Butter, margarine, cream, whipped topping, cooking fats/oils, gravy, mayonnaise, salad dressing without seeds	Nuts, bacon, whole olives
Fruits	Soft, cooked or canned fruits without seeds or skins; fruit juices and nectars; raisins; cooked dried fruit without seeds or skins	Hard or fibrous raw fruits; skins and seeds of fruits; uncooked large dried fruits, such as prunes or apricots.
Meat or equivalent	Ground or chopped meat and poultry; soft/fork-tender fish, meatloaves or meatcakes; casseroles made with ground meat; cottage cheese; American or other processed cheese; cheese sauce; scrambled eggs; hard-cooked eggs, as tolerated; smooth peanut butter; beans, as tolerated; yogurt	Whole meat and poultry, fried fish, hot dogs, whole sausage, crunchy peanut butter, hard/stringy cheese
Potato or alternate	Well-cooked diced, sliced or mashed white or sweet potato; rice, soft noodles/pasta	Potato skins, hash browns/fried potato, French fries, potato chips, corn chips, fried noodles
Soup	Any made with allowed potato/alternate or vegetables and ground meat/poultry	Soup with corn, vegetables with skin or large pieces of meat/poultry
Vegetables	Well-cooked soft vegetables without seeds or skin; chopped beets; cream-style corn	Raw vegetables. Vegetable skin/seeds, whole corn, tough cooked vegetables, crisp fried vegetables
Condiments/ miscellaneous	Honey, sugar, sugar substitute, salt, pepper, mustard, ketchup, jelly, syrup, tartar sauce, cocktail sauce	Coconut, nuts, seeds, crisp fried onions, fried noodles

### Sample Menu

Breakfast	Lunch	Supper
4 oz juice	2 oz ground roast pork with gravy	6 oz ground beef Stroganoff
¾ cup rice krispies	4 oz boiled sliced potato	½ cup bow tie noodles
2 pancakes	½ cup cooked broccoli cuts	½ cup cooked carrots
2 tsp margarine	Cornbread square	biscuit
2 tbsp syrup	2 tsp margarine	2 tsp margarine
8 oz milk	½ cup canned sliced peaches	iced cake square (no nuts/ coconut)
8 oz coffee or tea	8 oz milk	8 oz coffee or tea/creamer, as desired
2 tsp sugar	salt and pepper	1 tsp sugar
salt and pepper		salt and pepper

## Chapter 4. Diets for Weight or Eating Disorders

### Calorie Restricted Diet

- Purpose:** The calorie restricted diet is designed to promote weight loss in overweight and obese individuals who are at risk of obesity-related illness.
- Use:** The calorie restricted diet is indicated for non-pregnant individuals whose weight is  $\geq 120\%$  of ideal body weight. Calorie restriction may also be indicated for weight maintenance. Behavior modification, moderate exercise, and education about diet and medications can enhance compliance with diet and promote weight loss or maintenance.
- Modifications:** A decrease of 500 calories/day from estimated daily caloric requirement (per Harris-Benedict equation, see Chapter 1) will promote weight loss of about one pound per week. A meal plan is developed using the food exchange lists from the American Diabetes Association.
- Related Physiology:** Obesity is associated with exacerbation of hypertension, diabetes, hyperlipidemia, and certain types of cancer. The extra fat and weight associated with obesity complicates the management of heart disease, chronic obstructive pulmonary disease and osteoarthritis.
- Weight management requires a balance between energy consumed and expended. Since long-term success requires active participation in treatment and eventual lifestyle modification, screening individuals to assess their goals, level of understanding and motivation before beginning a weight management program can enhance its effectiveness.
- Adequacy:** A calorie restricted diet requires at least 1200 calories a day to be adequate in all essential nutrients. Diets containing fewer than 1200 calories require close medical supervision in an intensive weight management environment.

## Small Portions Diet

- Purpose:** The small portions diet is designed to reduce calories or volume of food at individual meals.
- Use:** The small portions diet is used as a liberal weight control plan for individuals who are non-compliant with calorie restricted diets. It is also used for individuals who cannot tolerate regular portions, due to depressed appetite or gastrointestinal illness (peptic ulcer disease, gastrectomy, pancreatitis, inflammatory bowel disease). When weight loss is not indicated, between-meal snacks are added to assure caloric adequacy. A goal of the diet is improve satisfaction with meals by providing foods included on the regular diet.
- Modifications:** The small portions diet uses regular diet foods, reducing the portion sizes of entrees, desserts, and high-fat foods. Butter or margarine, salad dressing, and mayonnaise are limited to one serving per meal. Low fat or skim dairy products are used when the diet is indicated for weight control.
- Related Physiology:** Obesity is associated with exacerbation of hypertension, diabetes, hyperlipidemia, and certain types of cancer. It complicates the management of heart disease, chronic obstructive pulmonary disease and osteoarthritis. Large volumes of food can increase discomfort in gastrointestinal disease (bloating, pain, diarrhea, dumping syndrome).
- Adequacy:** The diet provides approximately 1500 calories a day. A small portions diet can be adequate in all nutrients.

### Sample Menu

Breakfast	Lunch	Supper
4 oz juice	2 oz roast pork (no gravy)	3 oz Beef Stroganoff
$\frac{3}{4}$ cup rice krispies	$\frac{1}{2}$ medium baked potato	$\frac{1}{2}$ cup bow tie noodles
$\frac{1}{4}$ cup scrambled egg	$\frac{1}{2}$ cup broccoli slaw	$\frac{1}{2}$ cup cooked carrots
1 slice toast	1 slice bread	small dinner roll
1 tsp margarine	1 tsp margarine	1 tsp margarine
8 oz 1% milk	$\frac{1}{2}$ cup sliced peaches	$\frac{1}{2}$ portion of iced cake square
8 oz coffee or tea/creamer, as desired	8 oz 1% milk	8 oz coffee or tea/creamer, as desired
2 tsp sugar	Salt and pepper	1 tsp sugar
salt and pepper		salt and pepper

## Weight Control in Adolescents and Children

**Purpose:** The diet for weight control in adolescents and children is designed to promote weight loss or weight maintenance in children and adolescents, while maintaining linear growth and normal development.

**Use:** The diet is used for adolescents and children who are obese or at risk of becoming obese (see Chapter 1).

**Modifications:** A decrease of 250-500 calories/day from estimated daily caloric requirement (see Chapter 1), in combination with exercise will promote weight loss of about one half to one pound per week. After assessment of the child and the family's knowledge and motivation to lose weight, a meal plan can be developed by selecting numbers of exchanges from the Food Guide Pyramid or the exchange lists of the American Diabetes Association. Identifying and reducing intake of foods that are high in fat and sugar (candy, chips, soda) may be sufficient for weight loss/maintenance.

### Related

**Physiology:** In the United States, the incidence of pediatric obesity is increasing. About 25% of children and adolescents are obese. Identification and treatment of obesity in this population is critical, since body weight and composition in childhood are important predictors of adult obesity and associated increased morbidity and mortality. Monitoring of body composition can establish whether or not excess weight is related to body fat or muscle mass.

Weight loss in children must be gradual, so that growth is not restricted. If an overweight child has not yet reached maximum height, maintaining current weight and continuing linear growth can sometimes achieve desirable body weight.

**Adequacy:** A diet of at least 1500 calories per day with the recommended number of servings from each food group can meet nutritional requirements. Fewer than 1500 calories may be inadequate in some nutrients, especially calcium and iron. A multivitamin/ mineral supplement can assure adequacy of all nutrients.

## High Calorie and High Protein Diets

- Purpose:** High calorie and/or high protein diets are designed for individuals whose calorie or protein requirements are greater than can be achieved with a regular diet.
- Use:** The diets are used to meet calorie and protein requirements of individuals whose metabolic conditions, either temporarily or permanently, require greater amounts than are contained in the regular diet.
- Modifications:** When increased protein is indicated, foods containing protein of high biologic value are emphasized (egg, milk, meat, poultry, fish). An increase in calories can be achieved by adding additional servings of foods of moderate to high caloric density.
- Related Physiology:** Infection, surgery, fever, trauma, burns, head injury, and wound healing increase metabolic requirements for protein and calories. When protein needs are increased, an increase in calories supports the use of protein for tissue repair. See Chapter 1 for the procedure for calculating calorie and protein needs. Individuals whose activity levels are high may solely need extra calories to prevent weight-loss.
- Adequacy:** Routine monitoring of weight and other clinical indices of nutritional status will determine the adequacy of the diet. Diet plans that increase protein and calories are only successful when all or most of the foods are consumed. When intake is poor, a defined formula nourishment may more effectively achieve protein or calorie goals.

### Sample Menu

Breakfast	Lunch	Supper
4 oz juice	4 oz roast pork with gravy	8 oz Beef Stroganoff
1 cup cream of wheat	medium baked potato	½ cup bow tie noodles
½ cup scrambled egg	½ cup broccoli slaw	½ cup cooked carrots
large blueberry muffin	cornbread square	2 biscuits
2 tsp margarine	2 tsp margarine	2 tsp margarine
16 oz milk	½ cup sliced peaches	iced cake square
8 oz coffee or tea	8 oz milk	8 oz milk
2 tsp sugar	salt and pepper	1 tsp sugar
salt and pepper		salt and pepper

H.S. snack: peanut butter and jelly sandwich, 8 oz fruit-ade



## Chapter 5. Dietary Management of Hyperglycemia

**Purpose:** Diabetic diets are designed to help type 1 and type 2 diabetics to:

- Maintain normal serum blood glucose levels
- Maintain optimal serum lipid levels
- Provide adequate calories to attain and maintain a reasonable body weight, meet the growth and development needs of children and adolescents, meet the needs for pregnancy and lactation, and promote recovery from catabolic illness
- Prevent complications of insulin-treated diabetes, including hypoglycemia, illness and exercise-related problems, renal disease, autonomic neuropathy, hypertension, and cardiovascular disease.

**Use:** Medical nutrition therapy, in conjunction with exercise and insulin (exogenous/endogenous) or glucose-lowering drugs, helps normalize blood glucose levels in individuals with types 1 and 2 diabetes, impaired glucose tolerance (IGT) and gestational diabetes mellitus (GDM).

**Modifications:** Energy: Refer to Chapter 1.

**Protein:** The recommendation for protein is 10-20% of daily caloric intake from animal or vegetable sources. The individual requirement for protein is 0.8g/kg of body weight. There is insufficient evidence to recommend higher or lower amounts. In patients with diabetic nephropathy, 0.6g/kg may be useful once GFR begins to decline. Diabetics consuming lower amounts of protein may be prone to muscle weakness from nutrient deficiency.

**Fat:** The recommendation for total fat is dependent on the treatment goals for glucose, lipids and weight. Saturated fat should be <10%, and polyunsaturated fat should be  $\leq$ 10% of total caloric intake. With 30-40% of calories distributed among protein, saturated fat and unsaturated fat, 60-70% of calories remain to be distributed between monounsaturated fat and carbohydrate. Individuals at a healthy weight with normal lipid levels are encouraged to follow a diet containing <30% of calories as fat, with saturated fat <10%, polyunsaturated fat  $\leq$ 10%, and monounsaturated fat 10-15% of total calories, and cholesterol <300 mg/day. If LDL cholesterol is elevated, or remains elevated after following the guidelines listed above, saturated fat should be further reduced to <7% of total calories, and cholesterol to <200 mg/day.

**Carbohydrate:** In the past, simple sugars (fructose, sucrose and lactose) have been restricted in diabetic diets. It was assumed that because sugars are more rapidly digested and absorbed, they aggravate hyperglycemia. Starches were emphasized. In fact, fruits and milk have lower glycemic responses than most starches. The glycemic response of sucrose is similar to that of bread, rice and

potato. Therefore, the priority should be intake of total carbohydrate, not the source of carbohydrate.

**Sucrose:** As part of total carbohydrate, sucrose does not impair blood glucose control in either type 1 or 2 diabetes. Use sucrose gram for gram as any other carbohydrate. Consider the total nutrient content of high sugar foods (vitamins, minerals, fiber, fat), especially if total daily calories are controlled.

**Fructose:** There is a relatively smaller rise in plasma glucose from fructose, compared to sucrose and most starches. Fructose can be used as a sweetening agent; however, large amounts (20% of calories) can have adverse effects on total serum and LDL cholesterol. There is no reason to avoid fruits and vegetables, in which fructose occurs naturally, or fructose-sweetened foods, in moderation.

**Sweeteners:** There is no significant advantage or disadvantage of these nutritive sweeteners: corn syrup, molasses, fruit juice (& concentrate), dextrose, honey, or maltose.

**Polyols (sugar alcohols)** average 2 calories/g (1/2 of the usual 4 calories/g of carbohydrate). Use of polyols does not result in a major reduction of total dietary calories. The carbohydrate in polyols must be counted (at 1/2 the rate of regular carbohydrate). Large amounts can have a laxative effect (gas/bloating).

**Fiber:** The recommendation for fiber is the same as for the non-diabetic population, 20-35g from soluble/insoluble sources. The effect of select soluble fibers on absorption of glucose in the small intestine is insignificant in the amounts likely to be consumed.

**Sodium:** Recommendations are the same as for the non-diabetic population, <3000mg/day. For mild or moderate hypertension, or hypertension with nephropathy, intake should be  $\leq$ 2400 mg/day.

**Micronutrients:** With adequate dietary intake, no supplementation is necessary.  
**Chromium:** The only circumstance where replacement has any beneficial effect on glycemic control is in long-term chromium deficient TPN. Most people with diabetes are not chromium-deficient.

**Magnesium:** Deficiency may play a role in insulin resistance, carbohydrate intolerance and hypertension. Check serum Mg only in patients at high risk of Mg deficiency (diuretics, chemotherapy, immunosuppressants, alcoholism, hungry bone syndrome).

**Potassium:** Adequate amounts are contained in all diets in this manual, with the exception of renal diets, which are planned to lower potassium intake. Patients on Lasix may require an oral potassium supplement. Patients being discharged into the community on Lasix or HCTZ may require education on high-potassium foods.



## **Related**

**Physiology:** Diabetes is a metabolic disease characterized by hyperglycemia. In type 1 diabetes, autoimmune destruction of the  $\beta$  cells of the pancreas causes inadequate insulin production. In type 2, there is predominantly a deficiency in the action of insulin on target tissues.

Growth impairment and susceptibility to infection can result from chronic hyperglycemia. Acute, life-threatening complications of poorly controlled blood sugar include diabetic ketoacidosis and nonketotic hyperosmolar syndrome. Chronic hyperglycemia can lead to secondary symptoms of polyuria, polydipsia, polyphagia, weight loss and blurred vision.

Long term complications include retinopathy, leading to blindness; nephropathy, leading to renal failure; peripheral neuropathy, leading to foot ulcers, leg amputation and Charcot joints; and autonomic neuropathy, leading to gastrointestinal, genitourinary and cardiovascular symptoms and sexual dysfunction. Diabetes is an independent risk factor for atherosclerotic disease—the risk being greatest in people with other risk factors (family history, smoking, hypertension) and obesity. Medical nutrition therapy, along with exercise and pharmacotherapy, can help reduce glucose levels, normalize the lipid profile and reduce weight, thereby preventing acute and long-term complications of diabetes.

**Adequacy:** Diabetic diets, when planned in accordance with Dietary Guidelines for Americans, The Food Pyramid, or Diabetic Exchange Lists are adequate in calories and nutrients. Diets planned for weight loss are intentionally hypocaloric.

## **Diabetic Meal Planning**

The term “ADA diet” has never been defined. It is usually meant as a specific calorie level with standard levels of CHO, protein and fat, based on the diabetic exchange lists. The American Diabetes Association no longer endorses any single meal plan or percentage of macronutrients: therefore, it is recommended that the term “ADA diet” no longer be used.

The following dietary prescription or meal plans are **no longer appropriate** because they perpetuate the false ideas that sucrose must be restricted and restricting sucrose-containing foods will lead to better glycemic control: **No concentrated sweets, No sugar added, Low sugar, Liberal diabetic diet.**

## Diabetic Regular/Constant Carbohydrate Diet

The diet is planned with a fixed carbohydrate content for each breakfast, lunch, supper and snack. The amounts of calories, protein, and fat can vary. Total amounts of protein and fat in the diet will follow the recommendations described in the previous Modifications section. The diet is planned using the carbohydrate exchanges in the Diabetic Exchange Lists for Meal Planning. The carbohydrate exchange lists are: starch, fruit, milk, and other carbohydrates. Constant carbohydrate diets are the basis for teaching carbohydrate counting.

## Carbohydrate Counting

Carbohydrate counting is a method of meal planning designed to regulate carbohydrate in meals. Meal plans can contain fixed amounts of carbohydrate, to regulate blood sugar and prevent high triglycerides in type 2 diabetics, or they can provide flexibility for type 1 diabetics with well-controlled blood sugar to match exchanges of carbohydrate with units of insulin.

The basis for carbohydrate counting is a meal plan with fixed amounts of carbohydrate at each similar meal (breakfast, lunch, etc.). Diabetic individuals are taught to use the carbohydrate exchanges in the Diabetic Exchange Lists for Meal Planning. Each of the foods in the carbohydrate exchange lists has about 15g of carbohydrate. Single servings of food containing 5g of carbohydrate or less need not be counted.

Individuals who successfully learn to follow the carbohydrate exchange lists can progress to calculating numbers of carbohydrate exchanges from grams of carbohydrate on nutrition labels or nutrition information in recipe books. The following table serves as a guideline for calculating numbers of exchanges from grams of carbohydrate:

Grams of Carbohydrate	Target Grams of Carbohydrate	Exchanges of Carbohydrate
8-22	15	1
23-37	30	2
38-52	45	3
53-65	60	4

## Calorie Controlled Diets

Calorie controlled diabetic diets are required predominantly for patients who need to lose weight or maintain a weight loss. Brittle type 2 diabetics may also benefit from control of all food groups. Defined calorie diets are a useful tool for any new diabetic to learn carbohydrate control along with basic meal planning.

The diets are based on all of the exchange groups in the Diabetic Exchange Lists for Meal Planning. An appropriate calorie level is selected using the Harris-Benedict equation or alternate

method, as described in the chapter, Nutritional Assessment in the Adult Population. The exchange lists and samples of calorie-controlled diets follow.

### Special Nutritional Issues

Clear/Full liquid diets: Require ~200g of carbohydrate in equally divided meals and snacks. Liquids should not be sugar-free. Medications may need to be adjusted. Total daily grams of carbohydrate will have the most impact on glycemic response.

Enteral formulas/oral or tube feeding: Can use standard formulas of ~50% carbohydrate, such as Ensure. Blood glucose monitoring is required to adjust medication. Medication may have been decreased secondary to poor oral intake before the enteral formula was begun, especially if there has been a change to tube feeding. The change to a tube feeding adequate in carbohydrate and total calories may require an increase in medication. Spacing of feedings to simulate meal times may help glycemic control by timing feeding with insulin peaks.

#### EXCHANGE LISTS and NUTRITIVE VALUE

Group/ Lists	Carbohydrate (grams)	Protein (grams)	Fat (grams)	Calories (approximate)
<b>Carbohydrate Group</b>				
Starch	15	3	1 or less	80
Fruit	15	-	-	60
<b>Milk</b>				
Fat-Free (skim)	12	8	0-3	90
Low- fat	12	8	5	120
Whole	12	8	8	150
Vegetables	5	2	-	25
<b>Other Carbohydrates</b>	15	varies	varies	varies
<b>Meat and Meat Substitute</b>				
Very Lean	-	7	0-1	35
Lean	-	7	3	55
Medium-fat	-	7	5	75
High-fat	-	7	8	100
<b>Fat</b>	-	-	5	45

## FOOD LISTS

Foods high in sodium (>400 mg per exchange) are noted by this symbol (#). If an asterisk (\*) is next to a food, it indicates that the food has > 400 mg sodium if two or more exchanges are eaten.

<b>Food</b>	<b>Serving Size</b>
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**Starch List: 15 grams carbohydrate, 3 grams protein, 0-1 gram fat, 80 calories**

**Bread**

Bagel	½ (1 oz)
Bread, reduced-calorie	2 slices (1 ½ oz)
Bread, white, whole wheat, pumpernickel, rye	1 slice (1 oz)
Bread sticks, crisp, 4 in. long x ½ in.	2 (2/3 oz)
English Muffin	½
Hot dog or hamburger bun	½ (1 oz)
Pita, 6 in. across	½
Roll, plain, small	1 (1 oz)
Raisin bread, unfrosted	1 slice (1 oz)
Tortilla, corn, 6 in. across	1
Tortilla, flour, 7-8 in. across	1
Waffle*, 4 ½ in. Square, reduced fat	1

**Cereal and Grains**

Bran cereals	½ cup
Bulgur	½ cup
Cereals	½ cup
Cereals, unsweetened, ready-to-eat	¾ cup
Cornmeal (dry)	3 Tbsp
Couscous	1/3 cup
Flour (dry)	3 Tbsp
Granola, low-fat	¼ cup
Grape- Nuts	¼ cup
Grits	½ cup
Kasha	½ cup
Millet	¼ cup
Muesli	¼ cup
Oats	½ cup
Pasta	½ cup
Puffed cereal	1 ½ cup
Rice milk	½ cup
Rice, white or brown	1/3 cup
Shredded Wheat	½ cup
Sugar-frosted cereal	½ cup
Wheat germ	3 Tbsp.

**Starchy Vegetables**

Baked beans*	1/3 cup
Corn	½ cup
Corn on cob, medium	1 (5 oz)
Mixed vegetables with corn, peas or pasta	1 cup
Peas, green	½ cup
Plantain	½ cup
Potato, baked or boiled	1 small (3 oz)
Potato, mashed	½ cup
Squash, winter (acorn, butternut)	1 cup
Yam, sweet potato, plain	½ cup

**Dried Beans, Peas and Lentils (cooked) (1 starch and 1 very lean meat exchange)**

Beans and peas (garbanzo, pinto, kidney, white, split, black-eyed)	½ cup
Lima beans	2/3 cup
Lentils	½ cup
Miso	3 Tbsp.



### **Crackers and Snacks**

Animal crackers	8
Graham crackers, 2 ½ in. Square	3
Matzoh	3/4 oz.
Melba toast	4 slices
Oyster crackers*	24
Popcorn (popped, no fat added or low-fat microwave)	3 cups
Pretzels*	3/4 oz.
Rice cakes, 4 in. across	2
Saltine-type crackers*	6
Snack chips*, fat-free (tortilla, potato)	15-20 (3/4 oz.)
Whole-wheat crackers, no fat added	2-5 (3/4 oz.)

### **Starchy Foods Prepared with Fat (1 starch and 1 fat exchange)**

Biscuit, 2 ½ in. across	1
Chow mein noodles	½ cup
Corn bread, 2 in. cube	1 (2 oz)
Crackers, round butter type	6
Croutons #	1 cup
French-fried potatoes	16-25 (3 oz)
Granola	½ cup
Muffin, small	1 (1 ½ oz)
Pancake, 4 in. across	2
Popcorn,* microwave	3 cups
Sandwich crackers* (cheese or peanut butter filling)	3
Stuffing, bread (prepared)	1/3 cup
Taco shell, 6 in. across	2
Waffle, 4 ½ in. Square	1
Whole-wheat crackers, fat added	4-6 oz.

### **Fruit List: 15 grams carbohydrate and 60 calories**

Apple, unpeeled, small	1 (4 oz)	Kiwi	1 (3 ½ oz)
Applesauce, unsweetened	½ cup	Mandarin oranges, cnd	1/3 cup
Apples, dried	4 rings	Mango, small	¾ cup
Apple juice/cider	½ cup	Nectarine, small	1 (5 oz)
Apricots, fresh	4 whole (5 ½ oz)	Orange, small	1 (6 ½ oz)
Apricots, dried	8	Orange juice	½ cup
Apricots, canned	½ cup	Papaya	½ fruit (8 oz ) or 1c cubes
Banana, small	1 (4 oz)	Peach, med, fresh	1 (6 oz)
Blackberries/blueberries	¾ cup	Peaches, canned	½ cup
Cantaloupe, small	1/3 melon (11 oz) or 1c cubes	Pear, large, fresh	½ (4 oz)
Cherries, sweet, fresh	12 ( 3 oz)	Pears, canned	½ cup
Cherries, sweet canned	½ cup	Pineapple, fresh	¾ cup
Cranberry juice cocktail	1/3 cup	Pineapple, canned	½ cup
Dates	3	Pineapple juice	½ cup
Figs, fresh	1 ½ large or 2 med (3 ½ oz)	Plums, small	2 (5 oz)
Figs, dried	1 ½	Plums, canned	½ cup
Fruit cocktail	½ cup	Prunes, dried	3
Grapefruit, large	½ (11 oz)	Prune juice	1/3 cup
Grapefruit sections, canned	¾ cup	Raisins	2 tbsp
Grapefruit juice	½ cup	Raspberries	1 cup
Grapes, small	17 (3 oz)	Strawberries, whole	1 ¼ cup
Grape juice	1/3 cup	Tangerines, small	2 (8 oz)
Honeydew melon	1 sl (10 oz) or 1 c cubes	Watermelon	1 sl (13 ½ oz) or 1 ¼ c cubes

**Vegetable List: 5 grams carbohydrate, 2 grams protein, 0 grams fat, and 25 calories**

Exchange= ½ cup cooked vegetables or vegetable juice or 1 cup raw vegetable

Artichoke	Mixed vegetables (without corn, peas, pasta)
Artichoke hearts	Mushrooms
Asparagus	Okra
Beans (green, wax, Italian)	Onions
Bean sprouts	Pea Pods
Beets	Peppers (all)
Broccoli	Radishes
Brussels sprouts	Salad Greens(endive, escarole, lettuce)
Cabbage	Sauerkraut #
Carrots	Spinach
Cauliflower	Summer squash
Celery	Tomato, fresh
Cucumber	Tomato, canned*
Eggplant	Tomato sauce #
Green onions or scallions	Tomato/vegetable juice #
Greens ( collard, kale, mustard, turnip)	Turnips
Kohlrabi	Watercress
Leeks	Water chestnuts
	Zucchini

The sodium content of canned vegetables varies. The average amount of sodium is approximately 200mg per ½ cup serving unless otherwise noted.

**Milk List: 12 grams carbohydrate and 8 grams protein**

**Skim and Very Low Fat Milk (90 calories, 0-3 grams fat)**

Fat-free (skim) milk	1 cup
½ % milk	1 cup
1 % milk	1 cup
Nonfat or low-fat buttermilk*	1 cup
Evaporated skim milk	½ cup
Nonfat dry milk	1/3 cup dry
Plain nonfat yogurt	¾ cup
Nonfat or low-fat fruit flavored yogurt sweetened with aspartame or a nonnutritive sweetener	1 cup
Light soymilk	1 cup
Vegeicious	1 cup

**Low Fat Milk (120 carbohydrate and 8 grams protein)**

2% milk	1 cup
Plain low- fat yogurt	¾ cup
Sweet acidophilus milk	1 cup

**Whole Milk (150 calories, 8 grams fat)**

Whole milk	1 cup
Evaporated whole milk	½ cup
Goat's milk	1 cup
Kefir	1 cup

## Other Carbohydrates

### 15 grams carbohydrate or 1 starch or 1 fruit or 1 milk

Cookies, fat-free	2 small
Fruit juice bars, frozen, 100% juice	1 bar (3 oz)
Fruit snacks, chewy (pureed fruit concentrate)	1 roll (3/4 oz)
Fruit spreads, 100% fruit	1 Tbsp.
Gingersnaps	3
Ice cream, fat-free, no sugar added	1/2 cup
Jam or jelly, regular	1 Tbsp.
Pudding, sugar-free ( made with low-fat milk)	1/2 cup
Salad dressing, fat-free	1/4 cup
Syrup, light	2 Tbsp.
Syrup, Regular	1 Tbsp.
Yogurt, frozen, fat free	1/3 cup
Yogurt, frozen, fat free, no sugar added	1/2 cup
Brownie, small, unfrosted	2 in. Square
Cake, unfrosted	2 in. Square
Cookie or sandwich cookie with creme filling	2 small
Granola bar	1 bar
Hummus	1/3 cup
Ice Cream, light	1/2 cup
Spaghetti or pasta sauce, canned	1/2 cup
Yogurt, frozen, low-fat	1/3 cup
Vanilla wafers	5

### 30 grams carbohydrate or 2 starches or 2 fruits or 2 milks

Angel food cake, unfrosted	1/12 cake
Cranberry sauce, jellied	1/4 cup
Granola bar, fat-free	1 bar
Pudding, regular (made with low-fat milk)	1/2 cup
Sherbet, sorbet	1/2 cup

### 30 grams carbohydrate and 10 grams fat or 2 starches + 2 fats or 2 fruits + 2 fats or 2 milks + 2 fats

Cake, frosted*	2 in. Square
Cupcake, frosted	1 small
Doughnut, glazed	3 3/4 in. across ( 2 oz)

### 45 grams carbohydrate

Yogurt, fat free with fruit	1 cup
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**Meat and Meat Substitutes List: 7 grams protein and 0-8 grams fat**

Meat/Meat Substitute	Protein (grams)	Fat (grams)	Calories
Very Lean	7	0-1	35
Lean	7	3	55
Medium-fat	7	5	75
High-fat	7	8	100

Values represent baked, broiled, grilled, boiled or roasted meats. Visible fat should be trimmed before cooking. Flour, bread crumbs, coating mixes or fat have not been added.

**Very Lean Meat and Substitute: 35 calories, 7 grams protein, and 0-1 grams fat**

Cheese: Nonfat or low-fat cottage cheese	1/4 cup
Fat-free cheese*	1 ounce
Fish: Fresh or frozen cod, flounder, haddock, halibut, trout; fresh tuna or tuna canned in water	1 ounce
Game: Duck or pheasant (no skin), venison, buffalo, ostrich	1 ounce
Poultry: Chicken, turkey (white meat, no skin)	1 ounce
Cornish hen (no skin)	1 ounce
Shellfish: Clams, crab, lobster, scallops, shrimp, imitation shellfish	1 ounce
Other: Processed lunch meats*	
Fat-free or low fat ( $\leq 1$ gram fat)	1 ounce
Egg whites	2
Egg substitutes, plain	1/4 cup
Hot dogs* ( $\leq 1$ gram fat per ounce)	1 ounce
Kidney	1 ounce
Sausage* ( $\leq$ gram fat per ounce)	1 ounce

**Lean Meat and Substitute: 55 calories, 7 grams protein, and 3 grams fat**

Beef: Lean beef trimmed of fat round, sirloin, flank steak; tenderloin; roast (rib, chuck rump); steak (T-bone, porterhouse, cubed), ground round	1 ounce
Cheese: 4.5 % fat cottage cheese*	1/4 cup
Grated Parmesan*	2 Tbsp.
Cheeses* with $\leq 3$ grams fat per ounce	1 ounce
Fish: Herring	1 ounce
Oysters	6 medium
Salmon (fresh or canned), catfish	1 ounce
Sardines (canned)	2 medium
Tuna (canned in oil, drained)	1 ounce
Game: Goose (no skin), rabbit	1 ounce

Lamb: Roast, chop, leg	1 ounce
Pork: Lean fresh ham; lean canned, cured or boiled ham*; Canadian bacon #; tenderloin, center loin chop	1 ounce
Poultry: Chicken, turkey (dark meat, no skin)	1 ounce
Chicken, (white meat, with skin)	1 ounce
Domestic duck or goose (drained of fat, no skin)	1 ounce
Veal: Lean chop, roast	1 ounce
Other: Hot dogs* with $\leq 3$ grams fat per ounce	1 ½ ounce
Processed luncheon meats* with $\leq 3$ grams fat per ounce	1 ounce
Liver, heart	1 ounce
Tofu	½ cup
Tofu hot dog*	1
Tempeh	1/4 cup
Seitan	1 ounce
Roasted soy nuts	1/4 cup
Textured soy protein	1/4 cup
<b><u>Medium-Fat Meat and Substitute: 75 calories, 7 grams protein, and 5 grams fat</u></b>	
Beef: Prime rib and other prime grades trimmed of fat	1 ounce
Ground beef, meat loaf, corned beef, short ribs	1 ounce
Cheese: 5 grams or less fat per ounce	
Feta*, Mozzarella	1 ounce
Ricotta	1/4 cup (2 ounces)
Fish: Any fried fish	1 ounce
Lamb: Rib roast, ground	1 ounce
Pork: Top loin, chop, Boston butt, cutlet	1 ounce
Poultry: Chicken (dark meat with skin)	1 ounce
Ground turkey or chicken	1 ounce
Fried chicken (with skin)	1 ounce
Veal Cutlet (ground or cubed, unbreaded)	1 ounce
Other: Egg	1
Sausage* ( with $\leq 5$ grams fat per ounce)	1 ounce
Soy milk	1 cup
Tempeh	1/4 cup
Tofu	4 ounces or ½ cup

**High-Fat Meat and Substitutes: 100 calories, 7 grams protein, and 8 grams fat**

Cheese: All regular cheeses* (cheddar, Swiss, etc.)	1 ounce
Pork: Spareribs, ground pork, pork sausage *	1 ounce
Other: Processed luncheon meats* with $\leq$ 8 grams fat per ounce (bologna, salami, etc)	1 ounce
Sausage* (bratwurst, Italian, polish, knockwurst, etc.)	1 ounce
Hot dogs* (turkey or chicken)	1 ( 10 hot dogs/ pound)
Bacon*	3 slices ( 20 slices per pound)

***High-fat meat and one fat exchange***

Hot dogs * ( beef, pork or combination)	1 ( 10 hot dogs/pound)
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***High-fat meat and two fat exchanges***

Peanut Butter	2 tablespoons
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**Fat List: 45 Calories and 5 grams fat**

**Monounsaturated Fats**

Avocado, medium	1/8 (1 ounce)
Nuts: (2 tablespoons salted nuts contain approximately 115 mg sodium) almonds, cashews, mixed ( 50% peanuts)	6 nuts
peanuts	10 nuts
pecans	4 halves
Oil (canola, olive, peanut)	1 tsp
Olives: ripe* (black)	8 large
Green#, stuffed	10 large
Peanut butter, smooth or crunchy	2 tsp
Sesame seeds	1 tablespoon
Tahini paste	2 teaspoons

**Polvunsaturated Fats**

Margarine: stick, tub, squeeze	1 teaspoon
lower-fat (30-50% vegetable oil)	1 tablespoon
Mayonnaise: regular	1 teaspoons
reduced-fat	1 tablespoon
Nuts: walnut, English	4 halves
Salad dressing: regular	1 tablespoon
reduced-fat	2 tablespoons
Seeds: pumpkin, sunflower	1 tablespoon

**Saturated Fats**

Bacon, cooked	1 slice (20 slices per pound)
Bacon, grease	1 teaspoons
Butter: stick	1 teaspoons
whipped	1 teaspoons
reduced-fat	2 teaspoons
Chitterlings, boiled	2 tablespoons (1/2 ounce)
Coconut, sweetened, shredded	2 tablespoons

Cream, half-and-half	2 tablespoons
Cream cheese: regular	1 tablespoon (½ ounce)
reduced- fat	2 tablespoons (1 ounce)
Fatback or salt pork*	1 inch x 1 inch x ¼ inch piece
Shortening or lard	1 teaspoon
Sour cream: regular	2 tablespoons
reduced- fat	3 tablespoons

\*Use 2 inch x 1 inch x ½ inch piece in cooking if fatback is removed before eating.

**Free Food List: Less than 20 calories or less than 5 grams carbohydrate per serving**

**Fat-free or Reduced- fat foods**

Cream cheese, fat- free	1 tablespoon
Creamers, nondairy liquid	1 tablespoon
Creamers, nondairy, powdered	2 teaspoons
Mayonnaise, fat- free	1 tablespoon
Mayonnaise, reduced - fat	1 teaspoons
Margarine, fat-free	4 tablespoons
Margarine, reduced- fat	1 teaspoon
Nonstick cooking spray	
Salad dressing, fat- free	1 tablespoon
Salad dressing, fat-free, Italian	2 tablespoons
Salsa	¼ cup
Sour cream, fat- free, reduced-fat	1 tablespoon
Whipped topping, regular or light	2 tablespoons

**Sugar-free or low-sugar Foods**

Candy, hard, sugar-free	1 candy
Gelatin dessert, sugar-free	
Gelatin, unflavored	
Gum, sugar-free	
Jam or jelly, low sugar	2 teaspoons
Sugar substitutes	
Syrup, sugar-free	2 tablespoons
Cocoa powder, unsweetened	1 tablespoon

**Beverages**

Bouillon, broth, consomme  
Carbonated water, Club soda  
Coffee  
Diet soft drinks  
Drink mixes, sugar-free  
Mineral water  
Tea  
Tonic water, sugar-free

**Condiments**

Catsup	1 tablespoon
Horseradish	
Lemon Juice	
Lime Juice	
Mustard	
Pickles #, regular or light	
Taco sauce	
Vinegar	

**Seasonings**

Celery salt #, seeds  
Garlic salt #, powder  
Herbs, fresh and dried  
Onion salt #, powder  
Spices  
Hot Pepper sauces  
Worcestershire sauce



## **Combination Foods**

<b><u>Food</u></b>	<b><u>Amount</u></b>	<b><u>Exchanges</u></b>
Casseroles #, homemade	1 cup ( 8 oz)	2 starch, 2 medium-fat meat, 1 fat
Cheese pizza #, thin crust	1/4 of 10- inch pizza	2 starch, 1 medium-fat meat, 1 fat
Chili with beans #	1 cup ( 8 oz)	2 starch, 2 medium-fat meat, 2 fat
Macaroni and cheese#	1 cup ( 8 oz)	2 starch, 1 medium-fat meat, 2 fat
Vegetable soup #	1 cup ( 8 oz)	1 starch
Cream soup #	1 cup ( 8 oz)	1 starch, 1 fat
Bean soup #	1 cup ( 8 oz)	1 starch, 1 vegetable, 1 very lean meat

**SAMPLE MENUS**

**1500 Calorie Diet**

Exchange Group	No. Exchanges	CHO (grams)	PRO (grams)	FAT (grams)	CAL
STARCH	8	120	24	8	640
MEAT (lean)	5	-	35	15	275
VEGETABLE	3	15	6	-	75
FRUIT	3	45	-	-	180
MILK, Skim	2	24	16	2	180
FAT	3	-	-	15	135
<b>TOTAL</b>		<b>204</b>	<b>81</b>	<b>41</b>	<b>1485</b>

**1800 Calorie Diet**

Exchange Group	No. Exchanges	CHO (grams)	PRO (grams)	FAT (grams)	CAL
STARCH	10	150	30	10	800
MEAT (lean) (Med-fat)	4 1	-	28 7	12 5	220 75
VEGETABLE	3	15	6	-	75
FRUIT	3	45	-	-	180
MILK, Skim	2	24	16	2	180
FAT	6	-	-	30	270
<b>TOTAL</b>		<b>234</b>	<b>87</b>	<b>59</b>	<b>1805</b>

**2000 Calorie Diet**

Exchange Group	No. Exchanges	CHO (grams)	PRO (grams)	FAT (grams)	CAL
STARCH	13	195	39	13	1040
MEAT (lean) (Med-fat)	4 1	-	28 7	12 5	220 75
VEGETABLE	3	15	6	-	75
FRUIT	3	15	6	-	75
MILK, Skim	2	24	16	2	180
FAT	5	-	-	25	225

TOTAL		279	96	57	1995
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**For milk- free patterns, substitute for 1 milk exchange either 1 starch and 1 lean meat or 1 fruit and 1 lean meat.**

## Chapter 6. Dietary Management of Renal Disease

**Purpose:** The renal diet is designed to prevent accumulation of uremic toxins and maintain fluid and electrolyte balance in individuals with either compromised renal function not yet requiring dialysis, or end stage renal failure requiring dialysis.

**Use:** The diet is used to retard the progression of renal failure, while maintaining optimal nutritional status and minimizing the metabolic derangements related to renal failure.

### **Related**

**Physiology:** Renal disease is characterized by a reduced ability to excrete waste products and regulate body water, minerals, and organic compounds. The effects of renal disease on diet are pervasive, and monitoring intake of protein, phosphorous, sodium, potassium, and fluid are particularly important. Dietary protein restriction is used for patients who do not yet require dialysis to reduce blood urea levels, minimize uremic symptoms, and slow the rate of progression of renal failure. Increased protein is needed for patients receiving dialysis to account for losses into the dialysate and for the catabolic state thought to be induced by end stage renal disease. Dietary phosphorous is controlled to limit hyperphosphatemia, which can decrease serum ionized calcium levels and stimulate parathyroid hormone secretion, lead to metastatic calcification, and renal osteodystrophy. Sodium intake is modified to facilitate blood pressure control, maintain normal hydration status, and help prevent congestive heart failure and pulmonary edema. Potassium intake is adjusted to maintain normal serum potassium levels. Fluid allowances are based on urinary or dialysis output, and the presence of edema, congestive heart failure, or hypertension.

The patient with renal disease is also susceptible to both excesses and deficiencies of vitamins and trace elements. Supplementation with folic acid, vitamin B complex, vitamin C, vitamin D analogs, iron, and zinc are often necessary. Supplementation with vitamin A is not recommended because serum retinol binding protein and vitamin A levels are increased, and even small excesses of vitamin A may cause bone toxicity.

**Modifications:** The renal diet provided by DHMH facilities contains protein as specified between 40 and 80 grams per day, with 2,000 mg of sodium and 60 mEq of potassium. Other restrictions or requirements are based upon individual needs.

**Adequacy:** The complexity of care required can be daunting for the patient with renal disease, and dietary interventions can result in reduced food and nutrient intake. Many patients experience anorexia, gastrointestinal disturbances, or depression, which can negatively affect food intake. Supplementation with foods or formula with high caloric density may be required to maintain body weight and adequate nutritional status. Micronutrient supplementation may also be indicated, and requirements should be assessed on an individual basis.

**Average Nutrient Composition of Food Groups Per Single Serving**

	Protein (g)	Sodium (mg)	Potassium (mg)	Phosphorous (mg)	Calories
Meat/alternate	7	25-300	25-125	50-135	75-100
Milk/milk Products	4	60-200	175	50-150	50-200
Bread/starch	2	5-120	30-150	10-100	70-250
Vegetable	1-3	5-240	200	20-40	10-30
Fruit	Trace	Trace	150	20	40-150
Fat	Trace	50	Trace-30	Trace-20	35-50

**Sample Menu for 60 gm Protein Renal Diet**

Breakfast	Lunch	Supper
4 oz apple juice	2 oz Roast pork with gravy	2 oz Beef cubes
¾ cup rice krispies	½ cup Rice	½ cup bow tie noodles
2 slices toast	½ cup cole slaw	½ cup frozen carrots, cooked
2 tsp margarine	Sliced bread	Dinner Roll
2 tsp jelly	2 tsp margarine	2 tsp margarine
8 oz milk (1% or skim)	½ cup sliced peaches	Sherbet
8 oz coffee or tea	4 oz milk (1% or skim)	8 oz coffee or tea/creamer, as desired
2 tsp sugar, pepper	Pepper	1 tsp sugar, pepper

## Potassium and Sodium Restriction for the Renal Diet

	Allowed	Avoided
Beverages (need to limit on a fluid restriction)	Milk; fruit juices (apple, cranberry, grape, pear or peach nectar, fruit punch, lemonade); low-sodium carbonated beverages (non-cola type).	Chocolate milk; regular vegetable and tomato juices; orange, prune, and grapefruit juices.
Breads and cereals	Enriched white, wheat, rye, bagels, muffins, waffles, pancakes, crackers, rice cakes, popcorn. All cereals except those listed under avoid.	Bread, rolls, and crackers with salted tops; bran muffins, biscuits. All Bran, bran Flakes, raisin bran, total, and wheaties. Instant hot cereals.
Desserts and sweets	Cookies (shortbread, butter thins, vanilla wafers, sandwich types, oatmeal); Angel food, sponge, pound, or plain cake; apple, blueberry, or lemon meringue pie; danish; donut; gelatin with allotted fruit.	Desserts made with chocolate, nuts, or disallowed fruits; custard.
Fats	Butter or margarine, vegetable oils, mayonnaise, unsalted salad dressings, cream, cream cheese.	Regular salad dressings containing bacon fat, bacon bits, salt pork, snack dips made with instant soup mixes or processed cheese.
Fruits	Apple, blueberries, cranberries, cherries, grapefruit, pears, peaches, pineapple, plums, fruit cocktail, strawberries, watermelon, grapes (20/day), raisins (2T).	Apricots, banana, canteloupe, dates, kiwi, oranges, prunes, and other dried fruit.
Meats and meat substitutes	Any fresh or frozen meat, poultry, or fish; low sodium canned tuna or salmon; eggs and egg substitutes; low sodium cheeses; yogurt (plain or with allowed fruit); low sodium peanut butter.	Any smoked, cured, salted, koshered, pickled, or canned meat, fish, or poultry (bacon, ham, chipped beef, cold cuts, hot dogs, sausage, sardines, crab, anchovies, lobster, imitation seafood); frozen breaded meats, hard and processed cheese, cheese spreads and sauces, salted nuts; dried peas and beans.
Potato or alternate	Enriched rice, barley, pasta cooked without salt.	White or sweet potatoes; winter squash; instant rice or pasta with sauces or seasonings.
Soups	Homemade soups without added salt and with allowed vegetables.	Regular and low-sodium canned and dehydrated soups, broths, and bouillons.
Vegetables	Fresh or frozen asparagus, green beans, waxed beans, beets, broccoli, cabbage, carrots, cauliflower, collards, corn, cucumbers, cauliflower, eggplant, green pepper, kale, lettuce, mushrooms, mustard greens, peas, onions, zucchini.	Canned, salted, or pickled vegetables; artichokes, brussel sprouts, chili peppers, spinach, rutabagas, tomato, turnip.
Miscellaneous	Spices and seasonings without salt.	

## Chapter 7. Dietary Management of Cardiovascular Diseases

### Modified Fat and Cholesterol Diet

**Purpose:** The low fat/low cholesterol diet is designed to reduce total dietary fat, saturated fat and cholesterol.

**Use:** The diet is used for patients who have or are at risk of developing lipid disorders, diabetes or cardiovascular disease.

**Modifications:** The diet reduces total fat to <30% of calories, saturated fat to <7% of calories, and cholesterol to  $\leq 200$  mg. Lean meats and low fat dairy products are used, and fats and oils are limited. Dietary intake of monounsaturated and polyunsaturated fats and soluble dietary fiber is emphasized. Two servings of fish per week are recommended, based on the evidence of cardiovascular benefit of omega-3 fatty acids present in fish. Weight control through diet and increased physical activity are also important to reduce the risk of coronary heart disease.

#### Related

**Physiology:** Cholesterol, cholesterol esters, and triglycerides circulate in the plasma as lipoproteins. The five major classes of plasma lipoproteins, classified according to their physical and chemical properties, are chylomicrons, very low density lipoproteins (VLDL), low density lipoproteins (LDL), intermediate density lipoproteins (IDL), and high density lipoproteins (HDL). About two-thirds of plasma cholesterol is transported as LDL, which is considered the most atherogenic lipoprotein. Dietary management is aimed at maintaining desirable LDL levels. LDL levels are increased by dietary intake of saturated fatty acids, trans-unsaturated fatty acids, and to a lesser extent, cholesterol. Reduction of LDL cholesterol is observed when intake of polyunsaturated and monounsaturated fatty acids are increased, and to a lesser extent, with increased intake of soluble fiber and soy protein.

Low levels of HDL cholesterol are associated with an increased risk of atherosclerosis. Sedentary lifestyle, increased adiposity, and a diet rich in sugar and refined carbohydrates are associated with low circulating levels of HDL cholesterol and elevated serum triglycerides. Reducing dietary fat intake below 30% of calories may exacerbate these conditions, and is only recommended for severe hypertriglyceridemia (>1000 mg/dl), for which a very low fat diet (10-20% of total calories) can prevent pancreatitis.

**Adequacy:** The diet is adequate in all nutrients.

### Low Fat/Low Cholesterol Diet Foods

	Allowed	Avoided
Dairy Products	Skim or 1% milk. Nonfat or lowfat yogurt, cottage cheese, and cheese	Whole milk, cream, half and half, most nondairy creamers and whipped toppings, whole milk cottage cheese, cream cheese, sour cream, and high fat cheeses (whole milk Mozzarella, Cheddar, Jack, American, Brie, Feta, Muenster)
Fruits and vegetables	Fresh, frozen, canned, or dried	Any prepared in butter, cream, or other high fat sauce
Starches	Breads, bagels, english muffins, rolls, rice cakes, lowfat crackers (graham, matzo, saltines), most dry cereals, hot cereals, pasta, rice, dried beans and peas	Baked goods (pies, cakes, donuts, croissants, pastries, muffins, biscuits), snack crackers (cheese or butter crackers), granola-type cereals, pasta and rice made with cream, butter, or cheese sauce, egg noodles
Meat or equivalent	Limit to 6 oz: poultry without skin, shellfish, lean cuts of beef, veal, pork, lamb, or wild game, luncheon meats with no more than 10% fat  Limit egg yolks to 1 per week, egg whites, cholesterol-free egg substitutes	Corned beef, brisket, regular ground beef, shortrib, pork spareribs, goose, duck, liver, kidney, sweet bread, brain, sausage, bacon, regular luncheon meats, frankfurters, caviar, roe
Fats and oils	Limit to 6-8 tsp per day Unsaturated oils (corn, olive, peanut, canola, safflower, sesame, soybean), margarine or shortening made with unsaturated oils, mayonnaise, salad dressing	Butter, coconut oil, palm oil, lard, bacon fat, margarine or shortening made with saturated fat
Desserts and snacks	Angel food cake, low fat cookies (fig bars, gingersnaps, vanilla wafers, animal crackers), candy (jelly beans, hard candy, licorice, fruit chews), plain popcorn, pretzels, frozen desserts (ice milk, sherbet, sorbet, frozen yogurt, popsicles, fruit bars, fudgesicles)	Ice cream, frozen tofu or custard, chocolate candy, chips, buttered or cheese popcorn, most commercially prepared cookies, pies, and cakes



**Sample Menu**

Breakfast	Lunch	Supper
4 oz juice	2 oz Roast pork with low fat gravy	4 oz Beef cubes
$\frac{3}{4}$ cup rice krispies	Medium baked potato	$\frac{1}{2}$ cup bow tie noodles
2 slices toast	$\frac{1}{2}$ cup broccoli slaw	$\frac{1}{2}$ cup frozen carrots, cooked
2 tsp margarine	2 slices bread	dinner roll
2 tsp jelly	2 tsp margarine	2 tsp margarine
8 oz milk (1% or skim)	$\frac{1}{2}$ cup sliced peaches	sherbet
8 oz coffee or tea	8 oz milk (1% or skim)	8 oz coffee or tea/creamers, as desired
2 tsp sugar, salt, pepper	Salt, pepper	1 tsp sugar, salt, pepper

## Sodium Restricted Diets

**Purpose:** The sodium restricted diet is designed to reduce dietary sodium in order to manage hypertension in salt-sensitive individuals and promote loss of excess fluids in edema or ascites.

**Use:** Sodium restriction is used in the management of essential hypertension, cardiovascular disease, congestive heart failure, renal disease and liver disease.

**Modifications:** Americans typically consume 6-18 grams of sodium per day, which is considerably higher than public health recommendations to limit sodium intake to less than 3 grams per day. A “no added salt” diet traditionally allows 4-5 grams of sodium, although this is higher than current recommendations for the general population. Foods on this diet plan may be prepared with salt, but additional table salt is excluded. A mild sodium restriction contains approximately 3 grams of sodium. Salt in cooking and at the table is limited, as are processed foods and beverages that have a high sodium content. A moderate sodium restriction contains approximately 2 grams of sodium. Foods are prepared without salt, and table salt and high sodium processed foods and beverages are excluded. Milk is limited to 16 ounces per day. A moderate sodium restriction, considered impractical for most individuals at home, is recommended primarily for short-term use in the hospital setting.

### Related

**Physiology:** Hypertension is one of the controllable risk factors for cardiovascular disease and stroke. The prevalence of hypertension increases with age and is greater in African-Americans than in Caucasians. Hypertension is correlated with obesity, psychological stress, and high dietary sodium intake. An estimated 60% of individuals with hypertension are salt sensitive and may benefit from dietary sodium restriction.

**Adequacy:** Meal plans for mild and moderate sodium restrictions are adequate in all nutrients.

### Mild Sodium Restriction Foods

	Allowed	Avoided
Beverages	Milk; buttermilk limited to 1c/day; fruit juices; low-sodium and salt-free vegetable juices; regular vegetable juices limited to ½ c per day; low-sodium carbonated beverages	Buttermilk >1 c per day; regular tomato and vegetable juices >½ c per day
Breads and cereals	Enriched white, wheat, rye, and pumpernickel bread, hard and dinner rolls, muffins, biscuits, cornbread, waffles, pancakes, most dry and hot cereals, unsalted crackers and	Bread, rolls, and crackers with salted tops; instant hot cereals > 1 serving per day; biscuits, muffins, cornbread and pancakes limited to 2 servings per day.

	breadsticks	
Desserts and sweets	All	None
Fats	Butter or margarine, vegetable oils, mayonnaise, unsalted salad dressings, regular salad dressings in limited amounts; cream (light, sour, heavy)	Salad dressings containing bacon fat, bacon bits, salt pork; snack dips made with instant soup mixes or processed cheese
Fruits	All	
Meats and meat substitutes	Any fresh or frozen beef, lamb, pork, poultry, fish, shrimp; canned tuna or salmon if rinsed; eggs and egg substitutes; regular cheese limited to 2 oz per day; yogurt; regular peanut butter 3 times weekly; dried peas and beans; frozen dinners if <600 mg sodium	Smoked, cured, salted, koshered, or canned meat and poultry, including bacon, chipped beef, cold cuts, ham, hot dogs, sausage, sardines, and anchovies; processed cheese, cheese spreads and sauces; salted nuts
Potato or alternate	White or sweet potatoes, squash, enriched rice, barley, pasta	Commercially prepared potato, rice, or pasta mixes; commercial bread stuffing
Soups	Low-sodium commercially canned and dehydrated soups (regular products once weekly), broths, and bouillons; homemade soups without added salt and with allowed vegetables	Regular canned and dehydrated soups
Vegetables	All fresh and frozen vegetables; canned, drained vegetables	Sauerkraut, pickled vegetables, vegetables seasoned with ham, bacon, salt pork, or smoked pork/turkey
Miscellaneous	Limit added salt to ¼ tsp per day at the table or in cooking; salt substitute with physicians approval; unsalted tortilla chips, pretzels, chips, popcorn; pepper, herbs, spices, vinegar, fresh horseradish; ketchup, chili sauce (1 T); lemon or lime juice, hot pepper sauce; low sodium soy sauce (1T); mustard, (1 tsp); salsa (1/4 c)	Seasonings made with salt including garlic, onion, celery and seasoned salts; sea salt, rock salt, kosher salt, meat tenderizers, monosodium glutamate; regular soy and teriyaki sauces; most flavored vinegars; salted snack foods; olives

### Sample Menu

Breakfast	Lunch	Supper
4 oz juice	2 oz Roast pork with low sodium gravy	3 oz beef cubes with low sodium gravy
¾ cup rice krispies	Medium baked potato	½ cup bow tie noodles
2 pancakes	½ cup broccoli slaw	½ cup frozen carrots, cooked
2 tsp margarine	Cornbread square	Dinner roll
2 T syrup	2 tsp margarine	2 tsp margarine
8 oz milk	½ cup sliced peaches	Iced cake square
8 oz coffee or tea	8 oz milk	8 oz coffee or tea/creamer, as

		desired
2 tsp sugar, pepper	Pepper	1 tsp sugar, pepper

### Moderate Sodium Restriction Foods

	Allowed	Avoided
Beverages	Milk (limit to 2 c per day); fruit juices; low-sodium and salt-free vegetable juices; low-sodium carbonated beverages	Buttermilk; milkshake; chocolate milk; regular vegetable and tomato juices
Breads and cereals	Enriched white, wheat, rye, and pumpernickel bread, hard and dinner rolls, muffins, cornbread, waffles, most dry cereals, cooked cereal without added salt, unsalted crackers and breadsticks, low-sodium or homemade bread crumbs	Bread, rolls, and crackers with salted tops, quick breads, instant hot cereals, pancakes, commercial bread stuffing, self-rising flour and biscuit mixes, regular bread and cracker crumbs
Desserts and sweets	All; those made with milk should be within milk allowance	Instant pudding and cake mixes
Fats	Butter or margarine, vegetable oils, unsalted salad dressings (regular salad dressings limited to 1T); cream (light, sour, and heavy)	Regular salad dressings containing bacon fat, bacon bits, salt pork, snack dips made with instant soup mixes or processed cheese
Fruits	Most canned, fresh, or frozen	Fruits processed with salt or sodium containing compounds (dried fruits)
Meats and meat substitutes	Fresh or frozen beef, lamb, pork, poultry, fish, shrimp; canned tuna or salmon if rinsed; eggs and egg substitutes; low sodium cheeses; yogurt; low sodium peanut butter; dried peas and beans; frozen dinners if <500 mg sodium	Smoked, cured, salted, koshered, pickled, or canned meat and poultry, including bacon, chipped beef, cold cuts, ham, hot dogs, sausage, sardines, anchovies, crab, lobster, imitation seafood; frozen breaded meats, regular hard and processed cheese, cheese spreads and sauces, salted nuts
Potato or alternate	White or sweet potatoes, squash, enriched rice, barley, pasta cooked without salt	Commercially prepared potato, rice, or pasta mixes
Soups	Low-sodium commercially canned and dehydrated soups, broths, and bouillons; homemade soups without added salt and with allowed vegetables; cream soups within milk allowance	Regular canned or dehydrated soups, broths, or bouillon
Vegetables	Fresh, frozen, and low sodium canned vegetables	Regular canned vegetables, sauerkraut, vegetables pickled or prepared in brine, frozen vegetables in sauces; vegetables seasoned with ham, bacon, or salt pork
Miscellaneous	Unsalted tortilla chips, pretzels, chips, popcorn; salt substitute with physicians approval; pepper, herbs, spices, vinegar, lemon or lime juice, hot pepper sauce, fresh horseradish; low sodium soy sauce (1T); low sodium condiments limited to 1 tsp	Seasonings made with salt including garlic, onion, celery and seasoned salts; sea salt, rock salt, kosher salt, meat tenderizers, monosodium glutamate; regular soy, barbecue, teriyaki, steak, and Worcester sauces; most flavored vinegars; canned gravy

	(ketchup, mustard, chili sauce); salsa (1/4 c)	and mixes; regular condiments; salted snack foods; olives
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**Sample Menu**

Breakfast	Lunch	Supper
4 oz juice	2 oz Roast pork with low sodium gravy	3 oz beef cubes with low sodium gravy
3/4 cup rice krispies	Medium baked potato	1/2 cup bow tie noodles prepared without salt
1/4 cup scrambled egg	1/2 cup broccoli slaw prepared without salt	1/2 cup frozen carrots, cooked
2 slices toast	2 slices bread	Dinner roll
2 tsp margarine	2 tsp margarine	2 tsp margarine
8 oz milk	1/2 cup sliced peaches	1/2 cup applesauce
8 oz coffee or tea	8 oz milk	8 oz coffee or tea/creamer, as desired
2 tsp sugar, pepper	Pepper	1 tsp sugar, pepper

## Chapter 8. Medication Interactions with Foods and Nutrients

Medications have the potential to interact with foods or nutrients, since they can share physiologic and metabolic pathways. A simple example of a food/medication interaction is the beneficial effect food has as a buffer in the stomach. There are recommendations for some medications to be taken with food to minimize adverse gastrointestinal symptoms. Other medications are taken on an empty stomach to maximize absorption.

Some medications interact with specific foods or nutrients. Administration with an identified food or nutrient can either decrease absorption of the drug, thereby decreasing its therapeutic level, or increase absorption, so that it approaches a toxic level. Either scenario poses a risk of serious adverse consequence to the patient being treated. Medications can also affect nutritional status by increasing the potential loss of specific nutrients or masking a nutrient deficiency.

A policy on medication/food/nutrient interaction, specific to each institution, accompanied by a fact sheet listing the medications and their interactions, is the basis for procedures that will address the potential interactions. The pharmacy and dietetics departments compile the list of interactions. A pharmacy and therapeutics committee monitors policy. Procedures can include:

- Dispensing drugs with food (after a meal or with a snack)
- Dispensing drugs a prescribed number of hours before or after meals to avoid specific foods
- Omitting specific foods completely from the diet
- Adding nutrients that are depleted
- Monitoring serum nutrient levels
- Patient/family education

Educating patients and families on medication/food/nutrient interactions can optimize the effectiveness of the medications. Increasing self-prescribed use of herbs, vitamins, minerals and other over-the-counter nutritional supplements has added another element of risk of potential interaction with medications. Education should include:

- Medication schedule and importance of its adherence
- Foods to avoid, postpone or include
- Interaction with herbs and over-the-counter nutritional supplements
- Written instruction for aftercare, including copies of specific diets, when indicated

## Grapefruit Juice/Drug Interactions

Grapefruit juice interferes with the metabolism of some drugs that use the cytochrome P450 3A4 metabolic pathway. When grapefruit juice is administered concurrently, or in some cases, up to 4 hours before or after ingestion of one of these drugs, there can be a significant increase in active metabolite of the drug.

amlodipine (Norvasc)	indinavir (Crixivan)
atorvastatin (Lipitor)	lovastatine (Mevacor)
bupirone (Buspar)	nifedipine (Adalat)
carbamazepine (Tegretol)	Procardia)
cerivastatin (Baycol)	nimodipine (Nimotop)
cyclosporine (Neoral, Sandimmune)*	simvastatine (Zocor)
diltiazem (Cardizem, Tiazac, Dilacor)	triazolam (Halcion)
felodipine (Plendil, Renedil)	verapamil (Calan, Isoptin)

\*Grapefruit juice may be potentially useful to boost cyclosporine levels in transplant patients, reducing the amount of the drug that must be administered.

## Vitamin K Content of Foods

Vitamin K is a fat-soluble vitamin that is a cofactor in the synthesis of blood clotting proteins in the liver. Formation of a fibrin blood clot requires vitamin K. The recommended vitamin K intake is 65 mcg for women and 80 mcg for men. Bacteria in the digestive track produce some vitamin K. Because vitamin K is present in so many foods, average intake is about 300-500 mcg a day.

Warfarin (Coumadin) is a drug designed to inhibit fibrin clot formation in major blood vessels in the brain or heart. Avoiding foods high in vitamin K is not necessary. Consistency of intake is more important to keep prothrombin times stable. A food diary can assist patients in evaluating dietary factors if prothrombin time gets too low.

The following list of foods contains those with a relatively high vitamin K content per 100g. They are listed in decreasing order of vitamin K content. Some foods used as garnishes or herbs (parsley, lettuce) will contribute negligible amounts of vitamin K because of the small amount ingested. Soy and canola oils have moderately high amounts of vitamin K per tablespoon (about 70-75mcg). If used frequently or liberally, their amounts should be included in the food diary. Herbal teas that include sweet clover, tonka beans or woodruff should be avoided.

Natto	Brussel sprouts	Watercress
Green tea	Spinach	Endive
Swiss chard	Broccoli	Lettuce
Kale	Turnip greens	Green onions
Parsley	Collard greens	Mustard greens

Cabbage

Liver

## **Low Tyramine Diet**

Tyramine is an amino acid found in many foods. It is a vasoactive, or pressor amine. It is inactivated by monoamine oxidase from the gastrointestinal tract. A few foods also contain dopamine and phenylethylamine, pressor amines whose physiologic effect is similar to tyramine.

The tyramine content of foods varies greatly. In general, tyramine increases as foods age, either through the normal process of ripening and degradation, or through food processing, such as the culturing and fermentation required to make cheese, sausage, and many luncheon meats.

A class of antidepressants known as monoamine oxidase inhibitors (MAOIs) inhibits the catabolism of tyramine and other pressor amines. Pressor amines are then absorbed, displacing norepinephrine in sympathetic nerve endings and epinephrine in the adrenal glands. Physiological symptoms include severe headache, sweating, palpitations, dilated pupils, neck rigidity, and elevated blood pressure. The cluster of symptoms, known as hypertensive crisis, usually occurs within two hours of ingestion of the offending food or the drug. In rare cases, cardiac dysrhythmias, heart failure, or cerebral hemorrhage can occur.

### **Foods to Avoid**

Cheese, except cottage or cream cheese

(The terms “mild,” “fresh” or “processed” are misleading, since taste and relatively younger stage of aging are not reliable indicators of tyramine content)

Liver

Smoked or pickled meats, poultry or fish

Dried or fermented sausages, such as salami, pepperoni, summer sausage, beef jerky

Processed luncheon meats, such as bologna and hot dogs

Sauerkraut, kim chee, or other fermented vegetables

Fava beans (Italian broad beans)

Soybean paste, fermented bean curd, shrimp paste, soy sauce, fish sauce (nam pla)

Raspberries

Ripe avocado

Ripe figs

Yeast extracts (found in meat bouillon/bases, powdered soup and gravy mixes)

Marmite (a yeast extract product)

Red wine and sherry

Microbrew beer

Ginseng



## Chapter 9. Dietary Restrictions Secondary to Food Hypersensitivity

**Purpose:** Dietary modifications for a food allergic individual must eliminate all foods and food ingredients containing the offending allergen.

**Use:** Dietary restrictions are used to avoid a potentially serious immunologically mediated reaction in food sensitive individuals.

**Modifications:** Foods that have been documented to cause an allergic reaction must be strictly avoided. All recipes and purchased food items must be carefully screened for offending ingredients, and appropriate substitutions must be provided. Facility food preparation requires strict monitoring, as fatal allergic reactions have occurred from allergen residue on inadequately cleaned utensils or containers and reused frying oil.

Patient education is essential, including instructions for diligent reading of food labels and interpretation of ingredients to evaluate “hidden forms” of common foods. For example, many people are not aware that plain M&Ms contain peanut, or that canned tuna contains casein. It can be difficult to find processed foods that are free of certain allergens because companies are not required to list items that comprise less than 2% of total ingredients.

### **Related Physiology:**

An allergic reaction to food, or *food hypersensitivity*, is an abnormal immunologic response causing hives, respiratory distress, or other symptoms. Diagnosis of food hypersensitivity is made when there is a reproducible response to a specific food with evidence of an immunologic reaction to that food. Food hypersensitivity is often confused with *food intolerance*, which is the result of nonimmunologic mechanisms such as the metabolic disturbances caused by lactase deficiency or an adverse reaction caused by a toxic contaminant in a particular food. A *metabolic food disorder* is food sensitivity caused by exposure to a foodborne component that is toxic either because there is a genetic inability to metabolize that food component, or the food component has an unusual effect upon normal metabolism.

The causative agents of food hypersensitivity are naturally occurring proteins that are resistant to heat, proteolysis, and extremes in pH. The allergen is usually the major protein component of the food, and foods can contain one or many allergens. These food proteins, or antigens, bind to immunoglobulin E which is attached to previously sensitized mast cells or basophils, resulting in the release of chemical mediators such as histamine, prostaglandins, and other chemotactic factors. These mediators are responsible for producing the symptoms of food hypersensitivity. Some individuals have exquisite sensitivity to the offending food, and even trace amounts will trigger a reaction.

The perception of food allergy by patients is considerably higher than the true prevalence, as assessed by double blind food challenges. Prevalence of food hypersensitivity is estimated to be 4-6% in infants, 1-2% in children and <1% in adults. Children outgrow most food allergies, and adults may also become desensitized to food allergens over time. Relatively few foods have been implicated in the majority of allergic reactions. They are shellfish, fish, and nuts (peanuts and tree nuts) in adults; and eggs, nuts, milk, soy, and wheat in children.

Most reactions occur within minutes after eating, and reactions vary, depending upon the affected organ or organs. Skin symptoms, such as hives, swelling, and atopic dermatitis, are the most common allergic reactions to food. Respiratory reactions can include rhinitis, laryngeal edema, and asthma. Gastrointestinal reactions include nausea, vomiting, abdominal pain, and diarrhea. Systemic anaphylaxis can occur and can be fatal, if not treated immediately.

**Adequacy:** The diet of a patient with a food allergy can usually meet nutrient requirements. Adjustments or supplements may be required if the patient is allergic to many foods or to an entire food group.

### **Egg Free Diet**

Avoid all foods containing:

albumin  
egg white, egg yolk, dried egg, egg powder, egg solids, egg substitutes  
eggnog  
globulin  
livetin  
lysozyme  
mayonnaise  
meringue  
ovalbumin, ovomucin, ovomucoid, ovovitellin  
Simplese  
Marshmallows, marshmallow creme

Notes: A shiny glaze or yellow baked good MAY indicate the presence of egg. Egg whites and shells may be used as clarifying agents in soup stocks, consommés, bouillions, and coffees.

### **Milk Free Diet**

Avoid all foods containing:

Artificial butter flavor, butter, butter fat, buttermilk  
Casein, caseinates (ammonium, calcium, magnesium, potassium, sodium), rennet casein  
cheese, cottage cheese, curds  
cream, half and half, sour cream, sour cream solids  
custard, pudding  
ghee  
Hydrolysates (casein, milk protein, protein, whey, whey protein)  
Lactalbumin, lactalbumin phosphate, lactoglobulin, lactose

milk (derivative, protein, solids, malted, condensed, evaporated, dry, whole, low-fat, non-fat, skim)  
nougat  
whey (delactosed, demineralized, protein concentrate)  
yogurt

These ingredients may indicate the presence of milk protein:

Brown sugar flavoring  
Caramel flavoring  
chocolate  
high protein flour  
margarine  
natural flavoring  
Simplese (fat substitute made from either milk or egg protein)

Notes: Avoid products containing a “D” on the product label next to the circled K or U. This indicates the presence of milk protein.

Parve or pareve indicate that a product does not contain milk and is not run on the same processing line as milk containing products.

Processed meats including hot dogs, sausages, and luncheon meats, frequently contain milk or are run on production lines containing milk. Food manufacturers should be contacted before using these products.

Deli meats should be avoided due to the potential for cross-contamination from milk-containing products or cheeses from slicers, etc.

## **Peanut Free Diet**

Avoid all foods containing:

Cold pressed, expressed, or expelled peanut oil (most allergic individuals can safely eat foods containing peanut oil UNLESS it is cold pressed, expressed, or expelled)

Ground nuts  
Mixed nuts  
Nu-Nuts artificial nuts  
Peanut, peanut butter, peanut flour

Foods that MAY indicate the presence of peanut protein:

African, Chinese, Thai, or other ethnic dishes  
Baked goods  
Candy, chocolate  
cereal  
chili, spaghetti sauce  
crackers  
egg rolls  
hydrolyzed plant protein  
hydrolyzed vegetable protein  
ice cream, frozen yogurt, tofutti  
marzipan  
nougat

## **Tree Nut Free Diet**

Avoid all foods containing:

- almonds
- brazil nuts
- cashews
- chestnuts
- filberts (hazelnuts)
- gianduja
- hickory nuts
- macadamis nuts
- marzipan/almond paste
- nougat
- Nu-nuts artificial nuts
- nut butters, nut oil, nut paste
- pecans
- pine nuts (pignolia, pinion)
- pistachios
- walnuts
- natural extracts such as pure almond extract and natural wintergreen extract

Note: Ethnic foods, commercially prepared baked goods, and candy can be cross-contaminated with tree nuts.

## **Shellfish Free Diet**

Avoid all foods containing:

- abalone
- clams: cherrystone, littleneck, pismo, quahog
- crab
- crawfish, crayfish, ecrevisse
- lobster, langouste, langoustine, scampo, coral, tomalley
- mussels
- oysters
- scallops
- mollusks
- shrimp, prawns, crevette

## Chapter 10. Enteral and Parenteral Nutrition

### Enteral Nutrition Support

**Purpose:** Enteral nutrition support is used to improve or maintain optimal nutritional status in individuals unable to consume sufficient nutrients from a food-based oral diet. Compared to parenteral feeding, enteral feeding is beneficial to maintain gut structure and function, associated with a reduced incidence of infection, is less expensive and less invasive. Commercially prepared products can be used for extended periods to meet total nutrient requirements for specialized medical conditions.

**Use:** Commercially prepared liquid nutritionals are used orally or for tube feeding. The nature of the feeding disorder and the duration for which supplements are expected to be necessary determine the feeding route, feeding regimen, and formula that is selected.

#### Comparison of Routes for Administering Tube Feedings

Enteral Access	Indications	Advantages	Disadvantages
<b>Nasogastric</b>	Short-term use  Unable to take adequate or safe oral intake	Easy to place and remove  No surgery required  Low cost	May cause discomfort  Greater risk of aspiration vs. nasointestinal placement
<b>Nasoduodenal or nasojejunal</b>	Increased risk of aspiration  Unable to use gastric route due to: Impaired gastric motility; gastroesophageal reflux; gastric aspiration; gastroparesis	Decreased risk of pulmonary aspiration	Requires endoscopy for placement
<b>Gastrostomy</b>	Long-term use  Unable to use nasal or oral route	Intermittent/bolus feeding possible  Patient comfort  Can be used to administer medication	Requires invasive procedure  Stoma care required
<b>Jejunostomy</b>	Unable to use gastric route due to: Impaired gastric motility; gastroesophageal reflux; gastric aspiration; gastroparesis	Can be used for early post-operative feeding  Decreased risk of pulmonary aspiration	Requires invasive procedure  Difficult to maintain tube patency  Tube replacement difficult  Stoma care required  Infusion pump required  Administration of medication precluded

<b>Combined Gastrostomy/Jejunostomy</b>	Useful in patients requiring gastric suction or decompression with otherwise intact intestinal tract	May be weaned to gastric feedings	As listed above for jejunostomy
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### **Guidelines for Formula Selection**

Formula selection is based on medical condition and individual nutrient requirements, as assessed by a registered dietitian. Formulas are categorized as polymeric, predigested or elemental, modular, or specialized. Polymeric formulas require normal digestive and absorptive capacity and are complete with respect to vitamins, minerals, and trace elements. Most are lactose-free. Predigested or elemental formulas contain nutrients that are more readily absorbed, such as mono and disaccharides, amino acids, di- and tripeptides, and medium-chain triglycerides (MCT). These formulas are generally low residue, low viscosity, lactose-free, and hypertonic. Modular feedings consist of single or multiple nutrients. They can be combined to produce a nutritionally complete formula or used individually to enhance an existing formula. Modules are available for carbohydrate, fat, protein, and fiber. Specialized formulas are available for specific conditions, such as glucose intolerance, renal or hepatic disease, pulmonary distress, and trauma. Specific formula components are discussed below.

**Caloric density:** Caloric density is chosen based upon calorie and fluid requirements. One kcal/cc is standard, and contain about 85% water. Caloric densities between 1 and 2 kcal/cc are available if fluid restriction is needed, or if the volume of formula cannot be tolerated due to increased caloric requirements. Calorie-dense products may be diluted to less than 1 kcal/cc to assure adequate fluid intake when caloric needs are reduced.

**Protein:** The protein content of enteral formulas varies from 4% to 32% of total calories. Protein may be provided intact, usually as caseinates or soy protein isolates, as peptides of enzymatically hydrolyzed casein or whey, or as free amino acids.

**Fat:** Fat provides 1% to 55% of total calories, depending upon the use for which the formula is intended. Vegetable oils, which contain mostly long chain triglycerides, contribute essential fatty acids, limit osmolality, and enhance palatability. MCTs are a valuable calorie source for patients with malabsorption, since they do not require bile salts or pancreatic lipase for absorption into portal circulation. They do not, however, supply essential fatty acids.

**Carbohydrate:** Carbohydrate in formula is derived from cornstarch. Maltodextrin is the most complex carbohydrate source, followed by modified cornstarch and corn syrup. Carbohydrate content of formulas ranges from 30% to 90% of total calories. Higher carbohydrate formulas are hypertonic and may not be well tolerated by some patients. Lactose is present in milk-based and blenderized formulas.

**Fiber:** Products containing fiber may be beneficial to maintain normal bowel function or control diarrhea or constipation. Fiber may also improve glucose tolerance and decrease serum cholesterol. Fiber sources include soy polysaccharide (insoluble fiber), gum arabic, guar gum, and pectin (soluble fibers), and fructose oligosaccharides (non-digestible sugars).

**Micronutrients:** The volume of formula required to provide 100% of the RDA ranges from 1 to 4 liters. Routine laboratory chemistry can confirm adequacy or suspected deficiency. Formulas with reduced sodium, potassium and phosphorus are available for use in renal disease.

## **Methods of Administration**

The method of tube feeding administration depends on medical status, type of tube, feeding route, and volume of feeding. Bolus feeding is provided rapidly at specified time intervals by syringe, gravity or pump-assisted infusion. Bolus feeding is less restrictive for the patient but may be poorly tolerated and pose an increased risk for aspiration. Continuous drip feeding is administered at a constant rate over a long period of time, typically 16 to 24 hours per day. This method optimizes absorption and tolerance of feedings for patients and reduces the risk of aspiration. Continuous drip feedings are useful as an overnight supplement to daytime oral or bolus feedings.

## **Management of Complications**

Gastrointestinal, metabolic, and mechanical complications can occur with enteral nutrition support. The most common complications are discussed below.

Diarrhea (3-5 liquid stools per day or stool weight >200-250 g/day) is a common complication of enteral feedings. If diarrhea is the result of an infection, formula contamination must be ruled out. Proper sanitation and adherence to manufacturer specifications for formula hang times can prevent GI complications. Certain medications, such as antibiotics and antacids, can cause diarrhea. Diarrhea due to malabsorption may be corrected by a change in feeding schedule (decrease in rate of infusion, change to continuous infusion, reduction of feeding volume) or change of formula (lactose-free, fiber-containing, isotonic/low osmolar, fat content/composition). Antidiarrheal medications may be necessary.

Constipation may be due to inactivity, decreased fluid intake, lack of dietary fiber, or impaction. Additional free water and/or changing to a fiber-containing formula may be helpful.

Gastric irritation (atony), rapid rate of infusion, distal bowel obstruction, or medications can cause abdominal distention, nausea, or vomiting. A temporary decrease in rate or volume of feeding and positioning of patient on the right side, to facilitate passage of gastric contents through the pylorus, may be helpful. Tube placement, medication profile, and potential for obstruction should be considered.

Tube clogging is more likely when calorie-dense or fiber-containing formulas are used or if the tube is used for medication administration. Routine water flushes and proper tube size can prevent clogging.

## Parenteral Nutrition Support

**Purpose:** Parenteral nutrition provides total or partial nutrition support to persons unable to consume adequate nutrients via the gastrointestinal tract.

**Use:** Parenteral nutrition (PN) is the intravascular infusion of nutrients to patients unable to tolerate enteral feeding in amounts sufficient to maintain nutritional status. PN is indicated when the gastrointestinal tract is inoperative, for example, during severe malabsorption, enterocutaneous fistula, intractable vomiting or diarrhea, prolonged ileus, obstruction, short bowel syndrome, pancreatitis, radiation enteritis, ulcerative colitis, Crohn's disease, motility disorders, or congenital anomalies. It may also be indicated for patients with eating disorders who have severe malnutrition and cannot tolerate enteral nutrition for physical or emotional reasons.

The administration of PN carries the potential for serious complications. Risk versus benefit should be evaluated on an individual basis. Patients receiving PN must be monitored by health care professionals trained to detect and treat infectious, mechanical, metabolic, or nutritional complications that may arise.

PN can be provided via peripheral or central venous access. Peripheral access is obtained through a smaller vein, usually in the hand or forearm. Since peripheral veins are easily sclerosed by hypertonic parenteral solutions, peripheral PN is usually considered to be a temporary option. Peripheral PN is generally used when it is uncertain whether the patient's medical condition will resolve or require long term support via central venous access. Central venous access is obtained through a large diameter vein, usually the subclavian or superior vena cava, which empties directly into the heart. Central venous access can be considered permanent, and can accommodate infusions of medications, fluids, or blood products, in addition to PN.

### Components of Parenteral Nutrition

Carbohydrate is usually the major energy source in PN solutions. It is provided in the form of anhydrous dextrose monohydrate, which yields 3.4 kilocalories per gram. Solutions range from 5% to 70% carbohydrate. Administration of dextrose less than the glucose oxidation rate of 5-7 mg/kg/min is desirable to avoid hyperglycemia.

The primary function of protein in PN is to maintain nitrogen balance in order to spare skeletal muscle mass. Protein is administered in the form of crystalline amino acid solution providing 4 kcal/g. Protein should comprise 12% to 15% of the daily energy requirement, calculated according to nutritional status and disease state.



Parenteral lipid provides essential fatty acids and calories. Lipid preparations are aqueous emulsions of soybean or safflower oil. They are available in 10%, 20%, and 30% solutions, which provide 1.1 kcal/mL, 2.0 kcal/mL, and 3.0 kcal/mL, respectively. The current recommendation is that lipids be limited to 1 g/kg/day, or 25% to 30% of energy requirement. Greater concentrations risk impairment of neutrophil function, endotoxin clearance, and complement synthesis.

The major electrolytes in PN are sodium, potassium, magnesium, calcium, phosphate, chloride, and acetate. Electrolyte requirements are based on weight, nutritional status, and diagnosis. Typical requirements are sodium 1-2 mEq/kg, potassium 1 mEq/kg, calcium 0.2-0.3 mEq/kg, phosphorous 20-40 mmol, magnesium 0.25-0.35 mEq/kg, Chloride equal to sodium, and acetate as needed to maintain acid-base balance. Careful electrolyte monitoring and adjustments are an important part of PN management.

Commercial vitamin preparations contain vitamins A, D, E, C, folic acid, niacin, riboflavin, thiamin, pyridoxine, cyanocobalamin, pantothenic acid, and biotin. Preparations parallel the recommendations of the American Medical Association Nutrition Advisory Group (AMA NAG) for daily intravenous requirements. Vitamin K is not included since many patients on TPN receive anticoagulants. It must be added separately. Preparations of individual vitamins are available for patients with special requirements.

Parenteral mineral preparations are also based upon AMA NAG recommendations and contain zinc, copper, chromium, manganese, selenium, and iodide. Iron is not included because of the potential for anaphylactic reaction. It can be supplemented intravenously or intramuscularly. Individual mineral preparations are also available for patients with increased metabolic needs.

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# Appendix



## Dietary Procedures for Tests and Examinations

<b>Barium Enema</b>	48 hours before test: 24 hours before test: Day of test:	Low Fiber/low residue diet Clear liquid diet NPO until after procedure
<b>Myelogram</b>	No solid foods after 9PM on the evening before the test Clear liquids allowed up to 3 hours before the test	
<b>Intravenous Urography (IVU)</b>	Low fiber/low residue supper on the day before the test No solid foods after 8PM on the evening before the test Clear liquids allowed up to 3 hours before the test	
<b>Esophagoscopy/ Gastroscopy/ Duodenoscopy (EGD)</b>	NPO after midnight if test is scheduled in the early morning Clear liquids allowed up to 4 hours before the test if it is scheduled for late morning or early afternoon	
<b>Colonoscopy</b>	Clear liquid diet one full day before the test Avoid red or purple liquids/gelatin	
<b>Oral Glucose Tolerance Test (OGTT)</b>	Provide a minimum of 150g of carbohydrate each day, starting 72 hours before the test	
<b>Occult Blood Test</b>	Eliminate the following, starting 48 hours before the test: Red meats Raw fruits and vegetables Turnips Horseradish Melons Serve bran cereal at breakfast daily starting 48 hours before the test.	

## **Low Fiber/ Low Residue Diet**

**Purpose:** The low fiber diet is designed to reduce fecal output or prevent blockage when there is stenosis of the gastrointestinal tract.

**Use:** The diet is most frequently used as a component of preparation for tests of the gastrointestinal tract, such as barium enema. During acute periods of inflammatory bowel disease (IBD), such as ulcerative colitis or Crohn's disease, a low fiber diet can minimize pain from frequent stools. When there is stenosis of the gastrointestinal tract, the low residue diet prevents blockage in the area of stenosis.

**Modifications:** The low fiber diet consists of foods that minimize fiber. Whole grain breads, cereals are replaced with products made of refined carbohydrate. Limited amounts of cooked and canned fruits and vegetables are allowed. Legumes, nuts and seeds are omitted. In cases of IBD, an individualized menu may be required to limit or omit caffeine, specific spices, fat or lactose. The fiber content of the diet is typically <10g/day.

### **Related**

**Physiology:** Fiber-containing foods produce most of the residue that is eliminated through the lower gastrointestinal tract. Minimizing fiber assists in preparation for tests of this area. For testing purposes, the low residue diet is frequently followed by a clear liquid diet immediately before the test.

During acute periods of IBD, abdominal or rectal pain, nausea, diarrhea and anorexia can lead to inadequate intake. Temporary use of a low fiber diet can reduce painful or uncomfortable symptoms.

**Adequacy:** The diet, by its definition, does not meet the fiber recommendation for adults. Careful evaluation and individualized meal planning are indicated for individuals with severe symptoms of IBD to assure adequate caloric and nutrient intake. When used for test purposes, the diet is not used for a long enough duration to affect overall nutrient status of the patient.

### Low Fiber Diet Foods

	Allowed	Avoided
Beverages	As desired or tolerated	None
Breads/cereal	Breads and cereals made from refined flour, without bran, nuts, fruit, or seeds	Whole grain breads and cereals; any containing bran, nuts, fruit or seeds
Desserts	Plain cakes, cookies or pastries; gelatin, custard, pudding, sherbet and ice cream	Desserts with seeds, nuts, coconut, whole or dried fruits
Fats	As desired	None
Fruits	Canned or cooked fruit, ripe banana or melon, peeled apple, citrus sections without membrane, strained or clear fruit juice	Raw fruits with skins or membrane, dried fruit, berries, grapes, fruit juice with pulp
Meat or equivalent	Well cooked, tender meat, poultry or fish; eggs; creamy peanut butter	Beans, dried peas, lentils, chunky peanut butter
Milk or equivalent	Milk, yogurt, cheese, cottage cheese, natural and processed cheese, as tolerated	Yogurt or cheese with fruit skins, berries, nuts or seeds
Potato or alternate	White or sweet potato without skin, white rice, pasta and noodles	Potato skin, brown rice, other whole grains
Soups	Bouillon, broth or creamed soups made with ingredients from "Allowed" list	All others
Vegetables	Most well-cooked or canned vegetables without skin or seeds, pureed peas	Sauerkraut, peas, corn, raw vegetables, vegetables with skin or seeds
Condiments/miscellaneous	Smooth condiments, such as prepared mustard, ketchup, sugar, salt, pepper, vinegar, herbs or spices that are not whole seeds	Nuts, coconut, seeds, popcorn, pickles

### Sample Menu

Breakfast	Lunch	Supper
4 oz strained or clear juice	2 oz roast pork with gravy	6 oz Beef Stroganoff
¾ cup rice krispies	½ cup boiled sliced potato	½ cup bow tie noodles
2 pancakes	½ cup broccoli cuts	½ cup cooked carrots
2 tbsp syrup	cornbread square	biscuit
2 tsp margarine	2 tsp margarine	2 tsp margarine
8 oz milk	½ cup sliced peaches	Iced cake square (no nuts/coconut)
8 oz coffee or tea	8 oz milk	8 oz coffee or tea/creamer, as desired
2 tsp sugar	salt and pepper	1 tsp sugar
Salt and pepper		salt and pepper