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AUTHOR Hurley, Roberta Smith
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ABSTRACT

Nutrition is well-recognized as a necessary component of educational programs for physicians. This is to be valued in that of all factors affecting health in the United States, none is more important than nutrition. This can be argued from various perspectives, including health promotion, disease prevention, and therapeutic management. In all cases, serious consideration of nutrition related issues in the practice is seen to be one means to achieve cost-effective medical care. These modules were developed to provide more practical knowledge for health care providers, and in particular primary care physicians. This module is designed to assist physicians in learning how to determine what should be known about a patient's social history and how to ask the right questions in order to obtain this information. This information is important in order to maximize the potential effects of treatment. Included are learning goals and objectives, a self-check of achievement with regard to goals, and references. Appendices include questionnaires, a "Guide to Good Eating," a chart of the recommended daily dietary allowances, and a suggested food pattern for preschool children. (CW)

The Nutrition in Primary Care Series Contains These Modules:

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2. Appraisal of Nutritional Status
3. Nutrient and Drug Interactions
4. Normal Diet: Age of Dependency
5. Normal Diet: Age of Parental Control
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22. Exercise and Physical Activity
23. Vitamins and Trace Minerals
24. Behaviorial and Neurological Disorders
25. Preventing Hospital and Home Malnutrition
26. Questions About Common Ailments

Faculty Guide (includes comprehensive index for Modules 1-26)

Department of Family Medicine
College of Medicine - The Ohio State University
456 Clinic Drive - Columbus, Ohio 43210

17 Nutrition in Health Promotion: Individual and Social Factors

Roberta Smith Hurley, Ph.D., R.D.
Assistant Professor
Medical Dietetics Division
The Ohio State University
Columbus, Ohio

Project Editor
Lawrence L. Gabel, Ph.D.

Nutrition Content Editor
Charlette R. Gallagher-Allred, Ph.D., R.D.

Family Medicine Content Editor
Patrick J. Fahey, M.D.

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Public Health Service
Health Resources and Services Administration
Bureau of Health Professions
Division of Medicine

Project Officer: Margaret A. Wilson, Ph.D.

Acknowledgments

Project Staff

Lawrence L. Gabel, Ph.D.-Project Director, Associate Professor and Director, Graduate Education and Research Section, Department of Family Medicine, The Ohio State University, Columbus, Ohio

Joan S. Rehner-Project Assistant, Secretary, Graduate Education and Research Section, Department of Family Medicine, The Ohio State University, Columbus, Ohio

Patrick J. Fahey, M.D.-Family Medicine Coordinator, Assistant Professor and Director, Predoctoral Education Section, Department of Family Medicine, The Ohio State University, Columbus, Ohio

Charlette R. Gallagher-Allred, Ph.D., R.D.-Nutrition Coordinator, Nutritionist, Riverside Methodist Hospital, Columbus, Ohio

John S. Monk, Ph.D.-Evaluation Coordinator, Assistant Professor and Coordinator, Research and Evaluation, Graduate Education and Research Section, Department of Family Medicine, The Ohio State University, Columbus, Ohio

Independent Study Package Consultant

Tennyson Williams, M.D., Professor and Chairman, Department of Family Medicine, The Ohio State University, Columbus, Ohio

Nutrition Consultant

Jil Feldhausen, M.S., R.D., Nutritionist, Department of Family & Community Medicine, University of Arizona, Tucson, Arizona

Editorial Consultant

Chester E. Ball, M.A., Assistant Professor Emeritus, The Ohio State University

Technical Assistants

Annette M. Battafarano, M.A., Graduate Research Associate, Graduate Education and Research Section, Department of Family Medicine, The Ohio State University, Columbus, Ohio

Richard E. Doty, M.S., Graduate Research Associate, Graduate Education and Research Section, Department of Family Medicine, The Ohio State University, Columbus, Ohio

Criteria/Assessment Committee

Mark T. Winders, M.D., Resident, Department of Family Medicine, The Ohio State University, Columbus, Ohio

David R. Rudy, M.D., Director, Monsour Family Practice Residency Program, Monsour Medical Center, Jeannette, Pennsylvania.

Maria Steinbaugh, Ph.D., Associate Director, Nutrition Services, Ross Laboratories, Inc., Columbus, Ohio

Wilburn H. Weddington, M.D., Family Physician, Columbus, Ohio

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Introduction

In order for the primary care physician to provide successful therapy for patients, eliciting a good social history is essential. It is not easy for the physician to disregard his own attitudes and place himself in the patient's culture, but doing so is critical to planning an effective management strategy.

This module will assist you in learning how to determine "What you wanted to know about your patient . . . and should ask." The content of this module should be repeatedly explored with patients as they pass various milestones in life. Because patient priorities and life situations will change, your management strategies will also change.

Goal

The goal of this module is to provide an overview of the information on nutrition which is an essential component of the social history. Knowledge of the information will maximize success of therapy and improve patient compliance with the treatment plan.

Objectives

Upon completion of this module, you will be able to:

1. *Determine which factors in the social history may impact on the nutrition plan or may adversely affect an otherwise sound medical plan.*
2. *Identify nutrition-related problems that may develop either in childhood or in adulthood.*
3. *Develop a management strategy that will maximize patient compliance with the nutrition care plan.*

Eliciting a Social History

One of the greatest barriers in patient compliance to a treatment plan is the lack of understanding by the physician of the patient's ability to follow the plan. It is extremely important to determine what may be preventing a given patient from "doing what he/she is supposed to do." A well-taken history provides all the subtle, and not-so-subtle, clues to that aspect of management which can contribute to improved patient compliance. The physician who can move from conversation to gathering and assessing pertinent nutrition-related social data will be better able to develop a nutrition management plan that can be practiced by the patient.

A social history which contains information that can improve compliance includes the following factors:

1. *Patient lifestyle* - where the patient is in terms of state of health. What are the living patterns, eating patterns, and other food practices?
2. *Demographic data* - how the patient arrived at his/her present condition. What is the patient's age, gender, culture, education, race, religion, genetic makeup, and past medical and dietary history?
3. *Attitudes and feelings* - why the patient reacts or behaves in a certain manner in terms of eating patterns and practices of daily living. What is the meaning of health and well-being and the meaning of food? What are misconceptions about food and nutrition?
4. *Resources* - what helping systems are operating in allowing the patient to manage his/her life. What are the patient's support systems, insurance, and financial stability?

In the quest for the "meat" of medical care (i.e., pathophysiology and treatment), the physician may tend to overlook the importance of patient behavior, environment, and attitudes. The social history includes both internal (medical, attitudinal) and external (environmental) factors that interact to influence a patient's behavior.[1]

A great deal of this module will be devoted to the identification of internal and external factors which affect nutrition-related behavior. These factors will be analyzed so that change, if needed, can be facilitated given the confines of the patient circumstances. The desired outcome of change—improvement in health—is best achieved through patient cooperation with a management plan developed by both the patient and the physician. You can assist the patient greatly by helping him/her understand the reason for the desired change and by helping secure the means by which he/she can change.

A good social history is essential to a well-conceived management plan. To develop a nutrition management plan and facilitate change, it is critical to (1) identify the patient's value system, (2) identify the milestones or significant points in the evolution of the current condition, (3) identify the patient's expectations of the health care system, and (4) attempt to identify the patient's future health risks. Information about each of these areas can be gleaned from a good social history. A well-documented social history will also assist you in identifying the potential need for referral of patients to self-help groups or nutrition experts.[2]

"Nutrition Risk-Related" Components of a Social History

The components of a social history that relate to nutrition are the same ones that relate to other aspects of health: lifestyle, demographic data, attitudes and feelings, and resources. Each of these components will be analyzed for its contribution in developing a nutrition management plan.

Lifestyle

The patient's lifestyle implies where the patient is in terms of living patterns (marital status, activities, and occupation) and current dietary patterns.

Does the patient live alone or with others?
Reasons why this is an important question to ask are as follows:

- A young person living alone often eats out.
- When eating out frequently, it is difficult to adhere to a low-calorie or low-fat or low-salt diet.
- An elderly person living alone usually eats a diet high in carbohydrate and fat and low in protein. The diet is often low in calcium, riboflavin, zinc, magnesium, and vitamin B_{12}. For this reason, you

need to ask your elderly patients if they drink milk and eat cheese, meats, and vegetables. Milk and cheese provide calcium and riboflavin; meat and eggs provide vitamin B_{12} and zinc; vegetables provide magnesium. Omitting one or more food groups should be discouraged; if the patient is unable to eat from the basic four food groups, a daily multiple vitamin and mineral supplement is appropriate to include in your care plan.

- Recently widowed persons have often experienced anorexia and weight loss, as well as alcoholism and depression following the death of a spouse. These are priority patients for you, especially the widowed elderly patient.
- The presence of "significant others" can be a stimulus to eating, yet it may have a negative impact if the living arrangement is unsatisfactory. Home conflict stimulates the appetite of some people, destroys the appetite of others, and can be a reason for significant weight change.
- The single parent often has a hard time providing the environment and foods needed daily by a child when other responsibilities seem overwhelming. Appendices A, B, and F will assist you in identifying a possible nutrition problem with the child. Single parents may not always eat well themselves.

Are ethnic food practices a part of the lifestyle of the patient? Consider these points:

- The typical oriental diet is high in sodium and fiber, and a salt or fiber restriction may be difficult to achieve.
- Appalachian or southern poor individuals often eat high total-fat, high saturated-fat, and often low-protein and high-salt diets, and may have difficulty following low-or modified-fat restrictions, or a high-protein diet.
- Blacks often are intolerant to milk because of lactase deficiency but can tolerate fermented dairy products or Lact-aid milk, which supplies calcium, riboflavin, and protein; lactose intolerant persons may even tolerate 8-16 oz. regular milk daily.

Who cooks or shops for food for the household? Consider these points:

- Men living alone may not know how to plan a menu and budget.
- Men living alone may not know how to prepare foods to meet a specific diet modification.
- Elderly or disabled persons may not be able to obtain food as needed.
- Parents, especially new parents, may not know how to prepare formulas for infants or when to add solid foods to a child's diet.

Patient education about menu planning, food purchasing, and food preparation is often needed. Prior to doing so, however, it is important to ascertain who is the power figure in the family. Often the oldest person, sometimes a grandparent, is the power figure. You will need to determine in your own mind if advice given by you (or another counselor) will be accepted. If "grandma" and the counselor disagree, you will need to know how to provide correct advice without creating mistrust between either party.

Example:

MH is a 35-year-old white male who has a white-collar job. He is 5'11" and 230 pounds. He was at ideal body weight when married but has gained weight steadily since marriage eight years ago. After some questioning, you discover that he came from a large family in which both parents worked yet where there was abundant caring but no financial resources. The parents tended to demonstrate their caring by having a large quantity of "favorite foods" in the house, including candy, desserts, and snack foods. The children received excellent medical and dental care but were allowed (even encouraged) to eat freely of these foods. MH was an athlete as a youth and was able to maintain an ideal body weight and remain "fit." However, during college MH was (1) less physically active, and (2) inclined to indulge in the "favorite foods" to fill voids in time. His intake included regular consumption of beer. MH was combining sedentary lifestyle with a continuance of undesirable and excessive eating. Once married, his wife, a nurse, tried to instill in MH a new value system with regard to the importance and purpose of food intake. Over the years, MH has been unable to take on these new values, preferring rather to hold on to the old ones. His current diet history reveals continued "refuge" in eating "favorite foods," a practice which is now influencing his children and the value they are placing on the role of food in their lives. Thus, while this patient is "at risk" for personal nutritional problems, including disease, from over-indulgence and inactivity, his attitudes about food and fitness are also affecting those of his children.

What are the patient's activities and occupation? Consider these points:

- Some people who are intensely health conscious are engaged in bizarre eating habits including costly and ineffective supplements such as protein pow-

ders, vitamins, and minerals.

- A sedentary person may lack energy and socialization and often eat high-calorie, high-fat, high-salt convenience foods.
- The busy executive often skips breakfast, consumes excess alcohol, and eats lunch and dinner meals which are high in fat.
- The secretary may buy lunch from vending machines that usually offer items high in fat, calories, and salt.
- The truck driver may skip meals or consume foods high in fat, high in alcohol, and limited in amounts of fruits and vegetables; snacks often replace meals.

Individuals who put inordinate emphasis on certain foods or, conversely, place nutrition as a low priority in their lives are at risk of developing nutrition problems, including obesity, heart and liver disease, and possible vitamin-mineral toxicities. You or a nutrition expert need to counsel these persons on proper nutrition practices. Nutrition combined with regular physical activities are vital components of health and fitness. Combination of both is critical to effective weight loss programs. Table 17-1 provides a list of caloric expenditures of selected activities which can be helpful in planning weight-loss programs.

What are the patient's current dietary patterns?
The physician can learn a great deal about a patient's dietary practices by first discovering what his/her intake typically includes. What and how often does the patient eat? To answer questions about food intake, you may request that the patient keep a food diary in which all foods and beverages consumed for seven days are recorded (see Appendices A-C for sample questionnaires and Appendix D for the Guide to Good Eating which will help in evaluating the diary).

Once you have a typical pattern of eating, including the specific food selections, inquire about the patient's use of vitamin and mineral supplements. Consider these points:

- Some supplements provide a reasonable level of nutrients.
- Some supplements include single vitamins in an irrational, high-potency formula (see Appendix E for the Recommended Dietary Allowances for comparison; daily supplemental intake should not exceed five times the RDA).

Other related questions you should ask include:

- Are the supplements being taken...
  1. to complement dietary intake?
  2. to cure or prevent disease?
  3. to enhance physiologic function?
  4. Is their use at the expense of legitimate medical therapy?
  5. Does the supplement contain only essential nutrients, or does it provide non-nutrient substances such as lecithin, kelp, or cascara leaves?

The definition of an essential nutrient is one for which a physiologic need exists. Because the body cannot synthesize the nutrient (or cannot synthesize it in adequate amounts), it must therefore be supplied in the diet. Vitamins B_{15} (Pangamic Acid) and B_{17} (Laetrile), said to cure a number of illnesses, are not essential nutrients since a deficiency of each is not known to exist. Other non-nutritive substances, such as kelp, rutin, RNA, and garlic, may be harmless but do not provide unusual health benefits. Substances such as Laetrile, megadoses of vitamin A, selenium, and zinc plus dolomite may be toxic; they can and do pose a significant health risk. And, some patients self-prescribe "shotgun" formulas, which may contain as many as 50 nutrients, often provided in irrational doses. These supplements are not known to enhance health and well-being and are an economic drain and a source of disillusionment to many. Companies providing "more" of a nutrient are the sole benefactors in the effort to beat out the competitor.[3]

In summary, the physician needs to know:

1. What foods are typically eaten and how often?
2. Which, if any, supplements are being taken?
3. Why does the patient feel he must supplement his/her diet?

Some patients have unorthodox eating patterns. Some are healthy combinations while others are bizarre and unhealthy. The nature of such "alternate food patterns" and the reason a patient follows them are important to understand.

The rationale for alternative food patterns may be based on theories which are not necessarily true. Patterns that tend to exclude a number of foods require close scrutiny.

Vegetarian diets, while not necessarily fad diets, may be followed for religious reasons or "health," "spiritual," or physiological reasons to "purify" the body or to express an ethical and moral concern over eating foods

Table 17-1 **Energy Cost Index of Selected Activities**

Kilocalories Per Kilogram of Body Weight Per Hour Expended*

Type of Activity *By the Hour*	*kcal/kg/h*
Sitting quietly, reading, watching TV	1.2
Standing quietly	1.5
Hand sewing, ironing, preparing vegetables	1.9
Personal necessities — bathing, dressing, shaving	1.9
Standing and moving around	2.1
Cooking a meal, dishwashing, setting the table, cleaning cupboards, hand laundry, dusting, carpet sweeping	2.7
Bed-making, moving furniture, tidying a room, window cleaning	4.0
Climbing stairs	8.0
Occupational	
Sitting quietly thinking or performing math calculations	1.2
Driving (60 mph)	1.3
Teaching	2.0
Lab work	2.1
Hairdressing	2.2
Surgery	2.2
Assembly line work	2.5
Stacking beer cases	2.6
Carpentry	2.7-3.6
Wallpapering	2.9
Welding	3.6
Garage repairs	3.8
Hoeing and weeding	4.1
Nursing (bedside)	4.3
Walking with a load	4.3
Painting outside	4.6
Driving pigs	4.7
Quick marching	5.0
Stacking straw bales	5.4
Crossing river in basket suspended over river by pulley	6.3
Loading a truck with bricks	6.5
Shoveling	6.6
Recreational	
Playing cards or musical instruments	2.3
Walking at 3 mph	4.0
Archery, golf, sailing, pingpong, volleyball	2.3-4.6
Badminton, canoeing, cycling, dancing (ballroom), hockey, skiing, swimming, tennis (lub playing)	4.4-6.6
Basketball, boxing, rock climbing, football, rowing, squash, dancing (ballet or disco)	6.6+
Walking at 3 mph up a 10% incline	7.0
Horseback riding (galloping)	7.3
Cross country running	10.0
Underwater swimming with fins and suit	10.0+
Cycling (short-distance racing) approximately	18.0

*includes energy expended in activity plus basal metabolism plus food utilization.

From Snook, J.T.: *Nutrition: A Guide to Decision Making.* Englewood Cliffs, N.J.: Prentice-Hall, 1984, p. 170. Used with permission of the publisher.

Table 17-2 Types of Vegetarian Diets [3,5]

Name	Foods Included
Frutarian	Fruits, honey, nuts
Lacto-ovo vegetarian	Grains, vegetables, fruit, milk, eggs
Pescovegetarian	Grains, vegetables, fruits, fish
Pollovegetarian	Grains, vegetables, fruits, poultry, fish
Macrobiotic	Grains, vegetables, teas, herbs, seaweed

of animal origin (Table 17-2). Vegetarian diets can be nutritionally adequate.

True vegetarians (vegans) eliminate all animal products. Well-planned combinations of cereals, grains, legumes, and nuts can provide adequate essential amino acids (especially lysine, tryptophan, and sulfur-containing amino acids). Amino acid content of various food proteins is provided (Table 17-3).

Because of the foods eliminated from a vegan diet, the diet may be deficient in calcium, vitamin D, zinc, iron, riboflavin, niacin, iodine, and vitamin B_{12}. In addition, the high fiber intake retards iron absorption, and omission of meat results in low heme iron intake. Whole grains also contain high phytate levels which can retard mineral absorption.[3,4]

Currently, many persons (usually without physician advice) are trying the macrobiotic diet as adjunctive cancer therapy. The macrobiotic diet is based on consumption of foods to provide a balance of "yin" (strong) and "yang" (weak). The Zen macrobiotic diet is the most extreme form of this vegetarian diet which, when progressively followed through a series of steps, ultimately includes brown rice only. The nutrient and fluid deficiencies in this diet depend on which stage of the diet the individual is following (see Table 17-4).

The levels of the macrobiotic diet are presented along with the percent contribution of each food group. Level 7 includes only cereals and a minimal amount of fluid, obviously the most extreme form of the diet.

What are some other aberrant eating practices?

- Patients eating only single foods or a limited variety of foods; these persons usually believe specific foods have magical properties or are complete "super" foods.

Table 17-3 Amino Acid Content of Various Food Proteins

Essential Amino Acid	REQUIREMENTS (Grams per day) Female (55 kg)	Male (70 kg)	Whole Egg	Cow's Milk	Beef	White Flour	Rice	Soy Protein	Corn Meal	Gelatin	Peanuts	Potatoes	Cashews
Histidine	?	?	1.20	1.34	1.7	.91	.80	1.19	1.03	.40	1 2.	72	.95
Isoleucine	.66	.84	3.32	3.26	2.62	2.10	2.23	2.69	2.31	.70	2 06	2.19	2.80
Leucine	.88	1.12	4.40	5.00	4.10	3.51	4.10	3.80	6.48	1.52	3.04	2.49	3 49
Lysine	.66	.84	3.20	3.97	4.37	1.04	1.88	3.16	1.44	2 19	1 78	2 66	1 82
Sulfur-containing	.55	.70	2.74	1.70	1 87	1.51	1 50	1.56	1 58	.45	1 19	1.10	2.02
Phenylalanine*	.88	1.12	5.04	5.07	3.75	4 06	4.57	4.06	5.33	1.26	4.32	3.10	3 80
Threonine	.44	.56	2.49	2.35	2.21	1.31	1.86	1.97	1.99	.99	1 34	1.97	1.69
Tryptophan	.17	21	.82	.72	.58	.56	.51	.67	.30	0	.55	54	1.08
Valine	77	.98	3.71	3.50	2.78	1.97	3.33	2.62	2.55	1 26	2.49	2.67	3.65
Portions providing 50 grams of protein			7 eggs	1 1/2 qt skim	6 oz beef	4 cups	12 cups cooked	3/5 cup soy flakes	4 1/2 cups	8 7g envelopes	1 1/3 cups peanut butter	25 med.	2 cups
Kilocalories in above portions			560	540	480	1600	2400	336	2250	200	1140	2000	1570

* Also includes tyrosine.

From Snook, J. T.: *Nutrition: A Guide to Decision Making,* Englewood Cliffs, N.J., 1984, p.480. Used with permission of the publisher.

Table 17-4 Macrobiotic Dietary Regimen

No.	Cereals (%)	Cooked Vegs. (%)	Soup (%)	Animal (%)	Fruits Salads (%)	Desert (%)	Drinking liquid
7	100						*Sparingly*
6	90	10					"
5	80	20					"
4	70	20	10				"
3	60	30	10				"
2	50	30	10	10			"
1	40	30	10	20			"
1	30	30	10	20	10		"
2	20	30	10	25	10	5	"
3	10	30	10	30	15	5	"

From Erhard, D.: "The new vegetarians, part 2." *Nutrition Today* (1):20-27, 1974, p. 123. Used with permission of the publisher.

- Users of organic foods and natural or "health" foods; these persons believe foods grown or processed with chemicals are hazardous to health. Organically grown foods are usually produced in small volume and may have a short shelf-life, and tend to be costly. Herb teas, alfalfa and seaweed, wheat germ and other foods not known to offer nutritional advantages over conventional foods may be included (see Table 17-5).
- Some people feel additives which are used in foods to make the food supply safe, to prolong shelf-life, and to make the foods attractive are dangerous. The argument that chemicals added to foods are dangerous usually does not include the fact that foods themselves are made up of chemical elements.

In summary, some history findings that should be "red flags" to you include the following:

- omission of foods because of "harmful" properties
- use of "health" or "organic" foods
- emphasis on "natural" foods
- avoidance of chemicals in food

Although there may not be nutritional risks to some of these practices, they do warrant further questioning on your part to ascertain (1) if nutrients are lacking in the dietary pattern, (2) if the practices are related to promotion of health or disease treatment or prevention, (3) if the practices are followed to the exclusion of proper medical treatment and advice, and (4) if the patient can afford to adhere to these practices.

If the patient has unsound dietary practices, what may be some additional reasons for poor nutrient intake? Consider these points:

- A patient may avoid foods because of an "intolerance." Inquire if the food(s) causes gas, dyspepsia, diarrhea, or constipation. These symptoms may have an organic basis, may be an "old wive's tale," or may be psychosomatic in origin yet be very real to the patient.
- Changes in taste and smell with disease (renal disease, cancer, diabetes) or medication usage may reduce food intake.
- Cancer patients, perhaps receiving chemotherapy or radiation therapy, may have depressed appetites.
- Patients with pulmonary disease often find eating frightening and uncomfortable.

If the patient has been on numerous weight control regimens, how can these regimens pose a risk to good medical management? Consider these points:

- Prior unsuccessful attempts at weight control may affect the attitudes of patients about future regimens.
- Patients tend to prefer "fad diets" in hopes of achieving quick weight loss.
- A history of unsound weight control efforts may leave the patient in poor nutritional status.
- Physician attitude regarding weight will affect patient compliance.

In summary, questions concerning patient lifestyle discussed in this module include:

1. Does the patient live alone or with others?
2. Are ethnic food practices a part of the life-style of the patient?
3. Who cooks or shops for food in the household?
4. What are the patient's activities and occupation?

Table 17-5 Nutrient Composition of Selected Health Food Store Items

Food	kcal	Protein (g)	Calcium (mg)	Iron (mg)	Thiamin (mg)	Riboflavin (mg)	Vitamin C (mg)	Vitamin A (IU)
Brown rice	102	2.1	3	0.2	0.04	0.01	0	0
Sunflower seed	140	6.0	30	2.8	0.5	0.06	0	0
Dried apples	22	0.1	3	0.1	–	0.01	Trace	–*
Soya beans	36	3.0	20	0.7	0.1	0.2	0	8
Wheat germ	104	7.6	20	2.6	0.42	0.2	0	0
Pumpkin seeds	180	9.8	11	3.3	0.06	0.04	0	20.0
Natural seaweed	104	0.4	252	2.6	0.003	0.07	0	–
Honey	90	Trace	6	0.2	Trace	Trace	1	0
Carob flour	51	1.2	99	–	–	–	–	–
Sesame seeds	163	5.0	28	0.7	0.1	0.04	0	–
Blackstrap molasses	43	–	116	2.3	0.5	0.5	–	–
Soybean sprouts	13	1.7	13	2.3	0.06	–	4	22
Desiccated liver	120	28	10	6	0.2	4.4	70	0
Wheat bran	100	4	–	–	0.19	1.0	–	–
Tofu	20	2.2	36	0.5	0.02	0.008	0	0
Brewer's yeast	78	11	78	5.0	4.0	1.2	–	–
Alfalfa sprouts	10	1.0	0	0.4	0.02	0.02	–	200
Miso	48	3.0	19	0.5	0.02	0.03	0	11.2
Bulgur wheat	47	1.7	6	0.4	0.01	Trace	0	0

*Indicates no data available.

From Guthrie, H.A.: *Introductory Nutrition,* 5th edition. St. Louis, MO: C.V. Mosby Company, 1983, p. 553. Used with permission of the publisher.

5. What are the patient's current dietary patterns?
   Are supplements being taken?
   Why are supplements taken?
   Does the patient engage in alternative food patterns?
6. If the patient has unsound dietary practices, what may be some additional reasons for poor nutrient intake?
7. If the patient has been on numerous weight-control regimens, how can these regimens pose a risk to good medical management?

Demographics

Variables such as age and gender, cultural orientation, educational level, and past medical history can be identified through the social history and impact on compliance.

How do age and gender affect a health plan? Consider these points:

- Failure-to-thrive infants are priorities to you.[6] When you find these patients in your practice, you may want to review feeding practices with the infant's parents. The questionnaire in Appendix A may be helpful in eliciting food practices.
- Very young parents who are faced with feeding an infant for the first time may require counseling in greater depth than an older couple may require.
- School-age children often snack on high-salt, high-calorie foods which are low in nutrient density; frequently eaten snacks are those advertised on television and which peers eat.
- School-age children may reject nutritious foods offered at school lunch programs in favor of less nutritious foods pushed through peer pressure.
- Adolescents may also feel the peer pressure to adopt certain social and eating habits. Most remain well-nourished despite the incidence of obesity.[7] (See Appendix B for questions to elicit eating patterns and exercise habits.)

- Adolescent females often feel the pressure to be thin and are at risk of developing an eating disorder. These patients need both psychological and dietary counseling.

Questions that may identify patients at risk include:
Why do they eat as they do?
How do they feel about their body weight?
Do the obviously thin respond with remarks about fatness?

You might also ask the family if the teen actually eats at mealtime; or does he/she push food around on the plate while remaining sociable and actually eating very little?[8]

Factors that seemingly play a role in the onset of eating disorders include self-esteem, environment, and family dynamics. The criteria for diagnosis and treatment methods for anorexia, bulimia, and anorexia/bulimia, as well as social history aspects of these diseases, are covered in detail in Module 24, Behavioral and Neurological Disorders.

The elderly have problems specific to the aging process which can be identified using questions similar to those in Appendix C. Typical changes with aging include:

Physiological changes - loss of teeth, taste, hearing, eyesight, and smell; reduced basal metabolic rate; reduced intestinal absorption; constipation; elevated blood glucose, blood pressure, and lipid levels; reduced albumin levels affecting nutrient transport, development of osteoporosis and other chronic diseases; decreased muscle tone and limits on ambulation; decreased pulmonary function; decreased cardiac output; decreased mental acuity and memory; decreased tolerance to cold and heat; and decreased sensitivity to thirst.

Economic changes - limited finances, poor budgeting practices, loss of home.

Emotional changes - depression, anxiety, preoccupation with health, alcoholism, loss of friends, loss of independence.

Other changes - excessive drug ingestion and interference of nutrients and drugs.

Changes that normally occur as part of the aging process can precipitate problems in nutrition and compliance. It may be that your reassurance and assistance in matters of finance, housing, and nutrition will help relieve anxieties.[4]

How does cultural orientation of the patient affect a treatment plan? Consider these points:

- The sense of "family" among Jewish, Asian, Oriental, and Appalachian populations, for example, is often strong, and these relationships can enhance patient care but can limit outside assistance.
- Influx to the United States of Asian and Cuban refugees provides a challenge to the health care provider because of (1) extremes of interest in health, (2) extremes in willingness to accept assistance, and (3) extremes in cultural background, ethnic practices, and food preferences and tolerances.
- There are many documented cases of malnutrition and diseases in Indian, Black American, Puerto Rican, Mexican-American, and refugee populations living in this country.[9]
- Dietary habits vary with cultural orientation and impact on treatment plans of the physician.
  "Soul Food" cuisine: a blend of West African and Southern U.S. food habits; these cultural foods are high in sodium and saturated fat.
  Oriental cuisine: these foods are high in fiber and sodium, and low in fat.
  Cuisine from Japan, Carribean, Western South America, and Eastern Europe: these foods are high in salt and also are high in nitrates and spices.
  French and German Cuisine: foods from these countries include several herbs and spices, are high in fat and calories, and often are cooked with or eaten with wine or beer.

Thus the patient history should identify the eating practices of other cultures that may affect your management strategy.

How does educational level affect the treatment plan? The level of education will affect the patient's ability to comprehend his/her disease, treatment plan, and diet. Consider these points:

- Uneducated persons tend to be low-income and may be illiterate and unable to read written materials or may not be able to recall instructions.
- Uneducated persons may (and probably do) have needs unrelated to nutrition and therefore may not be able to focus on this part of a management plan.
- A better educated person may need and want specific, detailed materials in order to be well informed. Non-descriptive words may confuse even well-educated persons, such as the confusion experienced by a woman who had been told on separate occasions that she had "low blood,"

"high blood," and "bad blood." Obviously she needed more information to understand that she had anemia, high blood pressure, and venereal disease. As health professionals, we owe it to patients to provide the maximum amount of information the patient can handle in order to obtain the best patient compliance. Local or state dietetic associations, National Dairy Council, American Diabetes Association, American Heart Association, American Cancer Society, etc., have readings on various subjects at different reading levels which are available to the public.

- Keeping patients informed differs from allowing them to participate in decision-making. While popular theory suggests that patients want to make the decisions, Ingelfinger[10] points out that patients want facts and want the physician to prioritize the alternatives with a clear presentation of the best choice.
- Achieving compliance when a patient "feels fine" (i.e., in the control of hypertension and body weight) involves giving information for the purpose of motivation as well as understanding.

How do race and religion affect the health plan? Consider these points:

- Patients belonging to certain races often have different economic backgrounds, educational levels, value systems, and genetic makeup which may predispose the patient to certain conditions; e.g., lactose intolerance, sickle-cell anemia, gallstones, hepatitis, cancer, etc.
- Seventh Day Adventists are vegetarians who now have meat substitutes available to them.
- Mormons avoid caffeine, tea, and alcohol.
- Jews and Catholics observe many special religious days during which food intake is prescribed or proscribed. Different families observe these days in different manners, so a "typical description" is unwise and may be in error.

Some fringe religions of today have bizarre eating practices and followers may be at risk of developing nutritional problems.

- Hare Krishnas follow meatless diets and avoid alcohol to increase spiritual consciousness and "sustain" the chemical body. Many followers also self-impose dietary restrictions.
- Yoga philosophy disallows use of meat since it is "so near decomposition that uremia results from the toxic stress put on the body." Some Yoga followers believe that different foods promote different temperament, although modern communes often do not restrict the vegetarian food choices in such a way.[11] Some believers self-impose dietary restrictions and take "natural" supplements of vitamins and/or minerals.

How does the past medical history affect the treatment plan? Although the past medical history may not seem appropriate to discuss in this module, there are disease-, treatment-, and drug-induced eating patterns that can be identified in the social history.

- Numerous drugs, taken concurrently, particularly when prescribed by more than one physician, may interact with food digestion and nutrient utilization.
- Various medical and surgical treatments may affect eating patterns and food tolerances.
- Regular use of over-the-counter medications such as laxatives, antacids, and pain relievers interact with nutrient availability.

In summary, demographic information about a patient, achieved through taking a social history, is important to elicit and will affect a management plan. Questions concerning demographics discussed in this module include:

1. How do age and gender affect a health plan?
2. How does the cultural orientation of the patient affect a treatment plan?
3. How does educational level affect the treatment plan?
4. How do race and religion affect the treatment plan?
5. How does the patient's past medical history affect the treatment plan?

Attitudes and Feelings

Determining the attitudes and feelings of a patient can tell you why the patient reacts or responds as he does and how well he/she will respond to a plan of health management.

In this part of a social history, you seek to determine attitudes and feelings held by the patient about life, health, food, etc. Here it is important to determine why the patient eats. Is it for sustenance alone or is food

provided to express a feeling? Does the patient "eat to live" or "live to eat"?

Recall the case presented under lifestyle in this module. The lack of the patient's concern over his condition of obesity is worrisome. Some of the reasons for elevated body weight may be:

1. Overconsumption of food energy
2. Lack of sufficient energy expenditure
3. Patient belief that no food should go to waste and hunger should never be felt
4. The patient finds security in the obese state
5. The patient perceives his body size is acceptable

In this case, the patient and wife both set an eating example for their children. The patient, however, must take responsibility for self-care by learning the value of food to health. The wife can only be a facilitator in helping the patient in this regard. The security and comfort he finds in his obesity must be recognized by all concerned.

The physician has several roles to play in these situations. He/she can determine if the obesity is a problem which is recognized by the patient. If it is not, little can be done to encourage long-term weight control. Secondly, the physician can make it clear to the patient that the values and choices of the patient's children are being greatly influenced by him, and that by setting a poor example he is being unfair to his children. In addition, it is essential that the patient realize that *he* is the one responsible for the success or failure of any treatment program.

It is clear then that the attitudes and feelings of a patient will affect compliance with a management plan. Further, food-related attitudes and behavior are very personal. Health care providers need to recognize this source of potential inflexibility and call for compromise, when appropriate, to achieve compliance.

If it is therapeutically acceptable to compromise with a patient based on his/her known attitudes, compliance will be maximized. For example, an elderly overweight male with newly diagnosed type II diabetes mellitus may agree to a "no-added-sugar" diet with meal regularity but may not follow a strict 1800 kcal ADA diet designed with exchanges. Eliciting information from the social history about a patient's attitudes and feelings will help you in knowing when to be flexible, when not to compromise, and how best to help a patient comply with a management plan.

Resources

The support system surrounding the patient is one of the greatest factors in achieving compliance. Thus, in the social history you need to determine:

1. **Significant others**
2. **Financial stability of the patient**
3. **Physical resources available to the patient**

Consider the following:

- If "significant others" do not exist, the patient alone must motivate himself to seek and apply quality health and nutrition care to his daily life.
- Is the patient living with or near significant others who can support or facilitate the care plan?
- Is support needed from health care agencies, public health care, church, or other groups?

If the patient needs a support system, the following systems might provide needed support:

Church groups
Hobby groups
Physical activity groups
Senior citizens groups
Singles groups
"Cause" groups
Philanthropic groups
Support groups based on physical condition/disease (cancer, ostomy, AA, etc.)

In almost all cases, it is appropriate to encourage the patient to utilize his/her own inner resources and interests, to become acquainted with others, and to develop a personal support system.

- Does the patient have adequate finances to seek regular health care? Poor health is often traced back to a lack of financial resources, including inability to purchase foods.[8] Most places of employment provide a health care package or access to health care plans. Some jobs, including part-time jobs, however, do not provide a health care plan as part of a benefits package, and these individuals often cannot afford to seek health care or to purchase adequate and nutritious foods. As a physician, you can determine a patient's financial status and decide if there might be a financial problem, such as a total lack or an inappropriate utilization of available finances.

- Physical resources, such as housing, utilities, transportation, clothing, and so forth, will affect not only compliance but also self-esteem and feelings of adequacy.
- Group housing or shared meals in which several individuals take turns preparing meals in their respective homes or apartments may be appropriate suggestions to ease the burden of preparation of adequate meals; such may also increase the social contacts of the patient.
- Car pooling for grocery shopping can ease this task and increase socialization. A full social life can increase resource availability and can stimulate appetite as well.

In summary, a well-taken social history can identify the patient's support systems and resources, as well as the limitations. The strengths identified in the history can be utilized to overcome the limitations.

Problems in Adulthood and Early-Life Nutrition Practices

Questions about a patient's early years of life can be of assistance in preventing a problem in later years or in the treatment of a problem that may have begun in childhood and is expressed in adulthood.

Eliciting information about a patient's food intake during earlier years of life can be helpful to you in developing a management plan for the prevention of disease in later life or the treatment of current problems. Questions you might ask your patients include: (1) What has been their typical eating patterns? (2) What foods have generally been included or typically excluded from their daily diets? (3) What has been the role of snacks and what items were typically included as snacks? (4) Was alcohol regularly consumed?

Many of today's adults often report having consumed diets high in carbohydrates, especially sticky sugars, as children. There is a high correlation between sucrose consumption and incidence of obesity and dental caries (especially prior to fluoridation). As pointed out earlier in this module, the use of food as an expression of love and caring was and still is practiced in some settings. Consider the following:

- Quality of dental care and hygiene as a child is reflected in the incidence of both dental caries and periodontal disease as an adult.[4] Some population groups tend to disregard preventive and even prophylactic dental care because of limited income. The physician can give appropriate suggestions to perhaps minimize the negative effects of irregular dental care. Tips such as suggesting the use of a toothbrush even without toothpaste, can improve dental hygiene without significant expense.
- Treating the obese child is extremely difficult. Prevention of childhood obesity is the key to education for healthful lifelong eating habits.[4,12]

To assure proper feeding of children, the primary-care giver must be informed and motivated to set a good example. Food should not be used as a reward. Parents can teach good eating practices at home, primarily by offering a wide variety of foods to the child.

- Intake of children following vegetarian diets should be closely monitored to include adequate calories, protein, vitamin B_{12} and iron intake for optimal growth and development. Deficiencies of calcium and vitamin D (especially if the child is not exposed to sunlight) predispose the child to rickets.[4]

The Recommended Dietary Allowances for infants and children are excellent guides to follow for suggesting eating patterns for children (Appendix E). More general guides for feeding preschool children may be useful to you in practice (Appendix F); this is a good patient handout.

If through asking the above questions, you find that the patient's past intake generally was high in alcohol or limited in milk and dairy products, you should consider the following:

- A high alcohol intake is associated with liver, pancreatic, and biliary system diseases in later life.
- Alcohol and smoking are associated with cancer of the mouth, head, and neck.
- Alcohol intake increases the requirement of most nutrients, and alcoholics are prone to nutrient deficiencies.
- Chronic low calcium intake predisposes persons to osteoporosis and bone fractures in later life.

Components of a Social History

Depending on the patient, some components of the social history will be more essential than others to assess in order to better manage the patient. In this section, a sample list of questions

will be presented to assist you in determining if and how your patient is "at risk" concerning nutritional problems.

The checklist which follows is an example of a tool you might use to pull social history information together for analysis. You are encouraged to evaluate the data gathered in each section and to synthesize the information in a summary. Your recommendations then can be a quick reference for your use in follow-up lists.

Management Strategy

Once the problems are identified, the task of planning a management strategy is next. The management plan and provision of "longitudinal care" is the heart of the practice of the physician in primary care medicine.[2]

According to Williams,[2] the heart of family medicine should be prospective medical practice. Identifying the circumstances and participants in the plan, and the actions possible, allows appreciation of the multidimensional aspects of the task of providing longitudinal care. Such practice requires identification of baseline data, including behavioral data, psychosocial data, and prior experiences. Such data can tell you how much change the patient is capable of making. Additional data include the nutrition-related variables presented in this module.

From these data, you should be able to identify risk factors. These "red flags" allow further classification of the patient's stage of development, limitations, disease, and nutrition problems. This information then forms a basis or foundation for nutrition intervention.

Such early screening permits "anticipatory guidance" of the patient and family through the next stages of life. Identification of prospective variables such as what is in store in terms of resources, lifestyle, eating habits, employment, etc., is crucial as well. Preventive health care strategies can be put "in place," keeping the physical, psychosocial, and environmental interrelationships in mind.

According to Kron,[13] people vary in their ability to learn, based on inherent intelligence plus ability to learn in the short-term versus the long-term. The ability to apply knowledge also varies greatly (i.e., transfer of knowledge into action). All of the resources identified in this module influence these processes. In addition, learning and compliance are theoretically maximized when a patient:

- has minimized his fear or apprehension
- has a well-cared-for environment
- is satisfied with his care
- understands the treatment plan
- shows physical and/or emotional improvement
- has an interest in life
- has self-esteem
- accepts interdependence with others

It is therefore essential that you, as a primary care physician, be able not only to listen but listen for meaning. You must also be able to think through the messages sent by the patient. Your evaluation of the situation will be influenced by your own values and biases, but attempt to be objective and utilize resources around you to assist the patient in implementing the treatment plan.

Community Resources

Once a management strategy is developed, the physician must be able to direct the patient toward resources that will enable the patient to comply. These resources may be government-sponsored at the federal, state, or local level; private agencies; or individuals.

What community resources are available for information about nutrition? Consider these points:

- Registered Dietitians (RD) are individuals with educational and practical expertise to provide individual or group counseling on basic nutrition, diet modification, food preparation, etc.
- RDs are employed by hospitals and other health care institutions and are also in private practice associated with outpatient clinics of hospitals or with city or state health departments.
- Except in states where dietitians are licensed, anyone can call himself/herself a nutritionist and practice unconventional procedures such as "balancing body chemistry," hair analysis, and megavitamin therapy.

CHECKLIST

1. Patient Name _____
   Age_____ Marital status _____
   Education level _____
   Genetic, cultural, religious influences _____
   _____
   Evaluation:

2. School, employment _____
   Schedule _____
   Meal patterns and frequency _____
   _____
   Socialization _____
   Evaluation:

3. Attitudes about self and surroundings _____
   _____
   Feelings about health/disease _____
   _____
   Value placed on food, health, treatment _____
   _____
   Evaluation:

4. Resources:
   Income, assistance _____
   _____
   Medical insurance _____
   Amount spent on food _____
   Evaluation:

5. Current health status:
   Ambulatory _____
   Current medications, treatments _____
   _____
   Food intolerances _____
   Food intake _____
   Evaluation:

Summary:

Recommendations:

- Several private organizations and local affiliates employ RDs and provide nutrition services to the public:
  - American Diabetes Association
  - American Heart Association
  - American Cancer Society
  - Society for Crippled Children
  - Kidney Foundation
  - American Lung Association
  - County extension agents and schools
  - Credible groups, such as Weight Watchers, Overeaters Anonymous
  - Some food pantries have the counseling services of an RD available on a part-time basis.
- The church is another resource that can assist a patient in identification of resources.

What community resources are available for financial and food assistance? Consider these points:

- The local Welfare department can assist in obtaining Food Stamps.
- Maternal and Infant (M&I), and Women, Infants, and Children (WIC) programs operated by city or county government agencies, provide milk, juice, fortified cereals, and infant formula.
- School-age children can qualify for free or reduced-cost school lunch programs, funded by the federal government, in which at least 1/3 or more of the RDA is provided by inclusion of meat or meat substitutes, two or more vegetables or fruits, one bread or substitute, and one serving of milk each day (portion sizes depend on age group).

What resources are available for the elderly?

- Government-sponsored Title III-C (Older Americans Act) elderly feeding programs provide a balanced noontime hot meal plus social activities. If the individual is homebound, meals can be delivered. Call your local health department for additional information.
- Both government and privately sponsored agencies exist for shopping and meal preparation in the home. One-to-one counseling is available and is the preferred arrangement to meet an elderly person's specific needs. The expanding business of home health care companies has a nutrition component as part of the services. For more information, call your local health department.

The success of government-sponsored assistance programs is difficult to objectively measure.[9] A study of food stamp recipients in two counties in Oklahoma has demonstrated that such programs are beneficial if the recipients are motivated to seek health care and apply health knowledge.

Summary

In summary, a well-taken social history can identify strengths and weaknesses of a patient which will assist you in planning a management strategy and which will assist or hinder the patient in complying with your recommendations. Following is a list of strengths which can maximize the management plan:

- The patient has a positive attitude about himself.
- There is a history of good self-care.
- The patient has an acceptable basis of knowledge and application of good dietary principles.
- There is a history of a positive relationship with others and with the environment.
- The patient has maximized his available resources.
- The patient has demonstrated some creativity in dealing with life's problems.

Some weaknesses to be identified include the following:

- History of illness
- History of poor medical care and poor transition through life cycle stages
- Inactivity
- Negative outlook toward life
- Inappropriate priorities
- History of numerous attempts to escape from reality through the use of drugs, alcohol, or aberrant behavior
- Lack of support system or personal resource team

Evaluation of these factors with a subsequent development of a sound management strategy is essential to good medical practice.

Evaluation

Using either the Checklist provided in Components of a Social History or a checklist you have independently developed using what you have learned in this module, reevaluate several patients for whom dietary management is an issue. Examine the evaluation and recommendations you would make on the basis of your checklist and the evaluation and recommendations you made before you did the module. Then answer the following questions for yourself:

1. How do the evaluation and recommendations you made using the checklist differ from those you made previously?
2. What areas of evaluation did you miss when you considered the nutritional needs of your patients?
3. Are there instances where you missed key information regarding nutrition which would have affected the treatment plan or patient compliance?
4. What resources could you have employed to produce a better management plan for your patient?

A second activity you may wish to undertake is the development of "patient specific" nutritional checklists. These could include checklists for infants, children under 12, teenagers, women, etc. Appendices A, B, and C include examples of such checklists.

Discussing the above activities with colleagues will allow you to derive the most benefit from your work in this module. If you work with a trained nutritionist, invite that individual to participate in your discussions.

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Appendix A

Questionnaire for Parents of Infants

Patient_____ Historian (parent, other)_____
Patient Age_____ Gender _____

When does the infant get up in the morning?_____
What do you do with the infant then?_____

Bottle Feeding

What size of bottle is used? 4 oz_____ 8 oz_____
What do you put in the bottle? _____
How is formula made?_____

How much of the bottle is consumed?_____

Is baby held during feeding or is bottle propped?_____

How many bottles are taken each day? _____
How long does a 24 oz can of formula last? _____
Do you dilute it or use it as is from the can?_____

Breast Feeding
What do you eat in a typical day (include types of foods, beverages, and amounts)

Breakfast Lunch Dinner

Midmorning Snack Midafternoon Snack Evening Snack

How many hours per day do you rest/sleep? _____
How do others in your home feel about your breast-feeding? _____

After feedings, what does the baby do? _____

Is cereal put into a bottle or fed with spoon?_____

Do you feed solids from a jar or put in a separate dish? (older infant) _____

When does the baby go to bed at night?_____
Are there any feedings during the night?_____

Appendix B

Questionnaire for Teenagers

What is your usual intake?

Breakfast Lunch Dinner

Midmorning Snack Midafternoon Snack Evening Snack

****

(DO NOT COMPLETE THIS SECTION)

Evaluation:

Meat servings_____ SUMMARY:

Vegetable/fruit servings_____

Bread/cereal servings_____

Milk servings_____

****

What are your favorite snacks (include amounts)?_____

_____

When did you start eating snack foods?_____

What are your favorite beverages? _____ _____

How many meals do you eat with your family?_____

What is the greatest influence on how and what you eat?_____

_____

How do you feel about your weight?_____

_____

Do you exercise regularly?_____

If yes, what exercises do you do?

Appendix C

Questionnaire for Senior Citizens

What is your typical intake?

Breakfast Lunch Dinner

Midmorning Snack Midafternoon Snack Evening Snack

****

(DO NOT COMPLETE THIS SECTION)

Evaluation Need Amount Consumed Summary

Meat servings_____/_____

Fruit servings_____/_____

Bread/cereal_____/_____

Milk Servings_____/_____

****

What activities do you engage in? _____

Do you live alone or with others?_____ _____

Who shops for and prepares the food? _____

Do you find it difficult buying food?

Transportation problems_____ Financial problems _____

Making choices at the store_____ Other_____

Are you employed outside the home? _____

Do you take any nutritional supplements or vitamin pills? _____

_____

Do you avoid eating or drinking certain foods? _____

What ones? _____Why? _____

Have you ever followed or do you now follow a special diet?

_____

What kind?_____ Why? _____

Do you have problems chewing?_____ swallowing? _____

digesting food? _____ diarrhea/constipation?_____

How do you solve these problems?_____

Has your weight changed in the past month?_____ Past Year?_____

Was the change in intentional?_____

Guide to Good Eating

Milk Group

Calcium
Riboflavin (B_2)
Protein

2 Servings/Adults
4 Servings/Teenagers
3 Servings/Children

Foods made from milk contribute part of the nutrients supplied by a serving of milk

Meat Group

Protein
Niacin
Iron
Thiamin (B_1)

2 Servings

Dry beans and peas, soy extenders and nuts combined with animal protein (meat, fish, poultry, eggs, milk, cheese) or grain protein can be substituted for a serving of meat

Fruit-Vegetable Group

Vitamins A and C

4 Servings

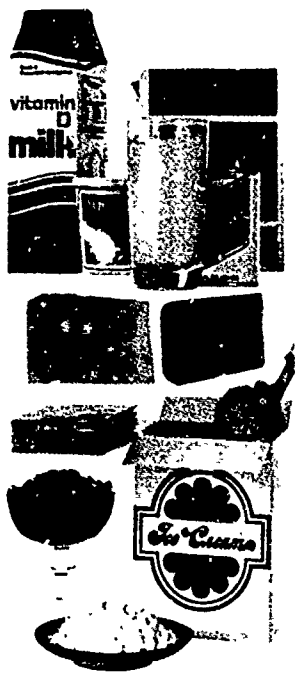
Dark green leafy, or orange vegetables and fruit are recommended 3 or 4 times weekly for vitamin A. Citrus fruit is recommended daily for vitamin C

Grain Group

Carbohydrate
Thiamin (B_1)
Iron
Niacin

4 Servings

Whole grain, fortified or enriched grain products are recommended



Foods and condiments such as these compliment but do not replace foods from the four groups

Amounts should be determined by individual caloric needs

Others

Carbohydrate
Fats

Guide to Good Eating
A Recommended Daily Pattern

Guide to Good Eating...

A Recommended Daily Pattern

The recommended daily pattern provides the foundation for a nutritious healthful diet

The recommended servings from the Four Food Groups for adults supply about 1200 calories The chart below gives recommendations for the number and size of servings for several categories of people

Food Group	Recommended Number of Servings				
	Child	Teenager	Adult	Pregnant Woman	Lactating Woman
Milk 1 cup milk, yogurt OR Calcium Equivalent 1½ slices (1½ oz) cheddar cheese* 1 cup pudding 1¾ cups ice cream 2 cups cottage cheese*	3	4	2	4	4
Meat 2 ounces cooked lean meat fish, poultry OR Protein Equivalent 2 eggs 2 slices (2 oz) cheddar cheese* ½ cup cottage cheese* 1 cup dried beans, peas 4 tbsp peanut butter	2	2	2	3	2
Fruit-Vegetable ½ cup cooked or juice 1 cup raw Portion commonly served such as a medium-size apple or banana	4	4	4	4	4
Grain, whole grain fortified enriched 1 slice bread 1 cup ready-to-eat cereal ½ cup cooked cereal pasta, grits	4	4	4	4	4

*Count cheese as serving of milk OR meat, not both simultaneously

"Others" complement but do not replace foods from the Four Food Groups Amounts should be determined by individual eating needs

Nutrients for Health

Nutrients are chemical substances obtained from foods during digestion They are needed to build and maintain body cells regulate body processes and supply energy

About 50 nutrients including water are needed daily for optimum health If one obtains the proper amount of the 10 leader nutrients in the daily diet the other 40 or so nutrients will likely be consumed in amounts sufficient to meet body needs

One's diet should include a variety of foods because no *single* food supplies all the 50 nutrients and because many nutrients work together

When a nutrient is added or a nutritional claim is made nutrition labeling regulations require listing the 10 leader nutrients on food packages These nutrients appear in the chart below with food sources and some major physiological functions

Nutrient	Important Sources of Nutrient	Some major physiological functions		
		Provide energy	Build and maintain body cells	Regulate body processes
Protein	Meat Poultry Fish Dried Beans and Peas Egg Cheese Milk	Supplies 4 Calories per gram	Constitutes part of the structure of every cell such as muscle blood and bone, supports growth and maintains healthy body cells	Constitutes part of enzymes some hormones and body fluids and antibodies that increase resistance to infection
Carbohydrate	Cereal Potatoes Dried Beans Corn Bread Sugar	Supplies 4 Calories per gram Major source of energy for central nervous system	Supplies energy so protein can be used for growth and maintenance of body cells	Unrefined products supply fiber – complex carbohydrates in fruits, vegetables and whole grains – for regular elimination Assists in fat utilization
Fat	Shortening Oil Butter, Margarine Salad Dressing Sausages	Supplies 9 Calories per gram	Constitutes part of the structure of every cell Supplies essential fatty acids	Provides and carries fat soluble vitamins (A D E and K)
Vitamin A (Retinol)	Liver Carrots Sweet Potatoes Greens Butter Margarine		Assists formation and maintenance of skin and mucous membranes that line body cavities and tracts, such as nasal passages and intestinal tract thus increasing resistance to infection	Functions in visual processes and forms visual purple thus promoting healthy eye tissues and eye adaptation in dim light
Vitamin C (Ascorbic Acid)	Broccoli Orange Grapefruit Papaya Mango Strawberries		Forms cementing substances, such as collagen, that hold body cells together, thus strengthening blood vessels, hastening healing of wounds and bones and increasing resistance to infection	Aids utilization of iron
Thiamin (B_1)	Lean Pork Nuts Fortified Cereal Products	Aids in utilization of energy		Functions as part of a coenzyme to promote the utilization of carbohydrate Promotes normal appetite Contributes to normal functioning of nervous system
Riboflavin (B_2)	Liver Milk Yogurt Cottage Cheese	Aids in utilization of energy		Functions as part of a coenzyme in the production of energy within body cells Promotes healthy skin, eyes and clear vision
Niacin	Liver Meat Poultry, Fish Peanuts Fortified Cereal Products	Aids in utilization of energy		Functions as part of a coenzyme in fat synthesis tissue respiration and utilization of carbohydrate Promotes healthy skin, nerves and digestive tract Aids digestion and fosters normal appetite
Calcium	Milk Yogurt Cheese Sardines and Salmon with Bones Collard Kale Mustard and Turnip Greens		Combines with other minerals within a protein framework to give structure and strength to bones and teeth	Assists in blood clotting Functions in normal muscle contraction and relaxation and normal nerve transmission
Iron	Enriched Farina Prune Juice Liver Dried Beans and Peas Red Meat	Aids in utilization of energy	Combines with protein to form hemoglobin, the red substance in blood that carries oxygen to and carbon dioxide from the cells Prevents nutritional anemia and its accompanying fatigue Increases resistance to infection	Functions as part of enzymes involved in tissue respiration

From National Dairy Council: *A Guide to Good Eating*, 4th edition. Rosemont, Illinois, 1977. Used with permission of the National Dairy Council.

Food and Nutrition Board, National Academy of Sciences—National Research Council
Recommended Daily Dietary Allowances, Revised 1980

	Age (years)	Weight (kg)	Weight (lb)	Height (cm)	Height (in)	Protein (g)	Fat-Soluble Vitamins: Vitamin A (μg RE)[b]	Vitamin D (μg)[c]	Vitamin E (mg α-TE)[d]	Water-Soluble Vitamins: Vitamin C (mg)	Thiamin (mg)	Riboflavin (mg)	Niacin (mg NE)[e]	Vitamin B-6 (mg)	Folacin[f] (μg)	Vitamin B-12 (μg)	Minerals: Calcium (mg)	Phosphorus (mg)	Magnesium (mg)	Iron (mg)	Zinc (mg)	Iodine (μg)
Infants	0.0–0.5	6	13	60	24	kg × 2.2	420	10	3	35	0.3	0.4	6	0.3	30	0.5[g]	360	240	50	10	3	40
	0.5–1.0	9	20	71	28	kg × 2.0	400	10	4	35	0.5	0.6	8	0.6	45	1.5	540	360	70	15	5	50
Children	1–3	13	29	90	35	23	400	10	5	45	0.7	0.8	9	0.9	100	2.0	800	800	150	15	10	70
	4–6	20	44	112	44	30	500	10	6	45	0.9	1.0	11	1.3	200	2.5	800	800	200	10	10	90
	7–10	28	62	132	52	34	700	10	7	45	1.2	1.4	16	1.6	300	3.0	800	800	250	10	10	120
Males	11–14	45	99	157	62	45	1000	10	8	50	1.4	1.6	18	1.8	400	3.0	1200	1200	350	18	15	150
	15–18	66	145	176	69	56	1000	10	10	60	1.4	1.7	18	2.0	400	3.0	1200	1200	400	18	15	150
	19–22	70	154	177	70	56	1000	7.5	10	60	1.5	1.7	19	2.2	400	3.0	800	800	350	10	15	150
	23–50	70	154	178	70	56	1000	5	10	60	1.4	1.6	18	2.2	400	3.0	800	800	350	10	15	150
	51+	70	154	178	70	56	1000	5	10	60	1.2	1.4	16	2.2	400	3.0	800	800	350	10	15	150
Females	11–14	46	101	157	62	46	800	10	8	50	1.1	1.3	15	1.8	400	3.0	1200	1200	300	18	15	150
	15–18	55	120	163	64	46	800	10	8	60	1.1	1.3	14	2.0	400	3.0	1200	1200	300	18	15	150
	19–22	55	120	163	64	44	800	7.5	8	60	1.1	1.3	14	2.0	400	3.0	800	800	300	18	15	150
	23–50	55	120	163	64	44	800	5	8	60	1.0	1.2	13	2.0	400	3.0	800	800	300	18	15	150
	51+	55	120	163	64	44	800	5	8	60	1.0	1.2	13	2.0	400	3.0	800	800	300	10	15	150
Pregnant						+30	+200	+5	+2	+20	+0.4	+0.3	+2	+0.6	+400	+1.0	+400	+400	+150	[h]	+5	+25
Lactating						+20	+400	+5	+3	+40	+0.5	+0.5	+5	+0.5	+100	+1.0	+400	+400	+150	[h]	+10	+50

[a] The allowances are intended to provide for individual variations among most normal persons as they live in the United States under usual environmental stresses. Diets should be based on a variety of common foods in order to provide other nutrients for which human requirements have been less well defined. See text for detailed discussion of allowances and of nutrients not tabulated. See Table 1 (p. 20) for weights and heights by individual year of age. See Table 3 (p. 23) for suggested average energy intakes.

[b] Retinol equivalents. 1 retinol equivalent = 1 μg retinol or 6 μg β carotene. See text for calculation of vitamin A activity of diets as retinol equivalents.

[c] As cholecalciferol. 10 μg cholecalciferol = 400 IU of vitamin D.

[d] α-tocopherol equivalents. 1 mg *d*-α tocopherol = 1 α-TE. See text for variation in allowances and calculation of vitamin E activity of the diet as α-tocopherol equivalents.

[e] 1 NE (niacin equivalent) is equal to 1 mg of niacin or 60 mg of dietary tryptophan.

[f] The folacin allowances refer to dietary sources as determined by *Lactobacillus casei* assay after treatment with enzymes (conjugases) to make polyglutamyl forms of the vitamin available to the test organism.

[g] The recommended dietary allowance for vitamin B-12 in infants is based on average concentration of the vitamin in human milk. The allowances after weaning are based on energy intake (as recommended by the American Academy of Pediatrics) and consideration of other factors, such as intestinal absorption; see text.

[h] The increased requirement during pregnancy cannot be met by the iron content of habitual American diets nor by the existing iron stores of many women; therefore the use of 30–60 mg of supplemental iron is recommended. Iron needs during lactation are not substantially different from those of nonpregnant women, but continued supplementation of the mother for 2–3 months after parturition is advisable in order to replenish stores depleted by pregnancy.

From Food and Nutrition Board, National Academy of Sciences—National Research Council: *Recommended Dietary Allowances,* Ninth Edition. Washington, D.C., National Academy Press, 1980 (to be revised as of Fall, 1985). Used with permission of the publisher.

Appendix F

Suggested Food Pattern For Preschool Children*

Food	Portion size	Number of portions advised	
		Ages 2 to 4 years	Ages 4 to 6 years
Milk and dairy products			
Milk†	4 oz	3 to 6	3 to 4
Cheese	½ to ¾ oz	May be substituted for one portion of liquid milk	
Yogurt	¼ to ½ cup	May be substituted for one portion of liquid milk	
Powdered skim milk	2 tbsp	May be substituted for one portion of liquid milk	
Meat and meat equivalents			
Meat‡, fish§, poultry	1 to 2 oz	2	2
Egg	1	1	1
Peanut butter	1 to 2 tbsp		
Legumes—dried peas and beans	¼ to ½ cup cooked		
Vegetables and fruits			
Vegetables		4 to 5 to include 1 green leafy or yellow‖	4 to 5 to include 1 green leafy or yellow
Cooked	2 to 4 tbsp		
Raw	Few pieces		
Fruit		1 citrus fruit or other vegetable or fruit rich in vitamin C	1 citrus fruit or other vegetable or fruit rich in vitamin C
Canned	4 to 8 tbsp		
Raw	½ to 1 small		
Fruit juice	3 to 4 oz		
Bread and cereal grains			
Whole grain or enriched white bread	½ to 1 slice	3	3
Cooked cereal	¼ to ½ cup	May be substituted for one serving of bread	
Ready-to-serve dry cereals	½ to 1 cup		
Spaghetti, macaroni, noodles, rice	¼ to ½ cup		
Crackers	2 to 3		
Fat			
Bacon	1 slice	Not to be substituted for meat	
Butter or vitamin A–fortified margarine	1 tsp	3	3 to 4
Desserts	¼ to ½ cup	As demanded by calorie needs	
Sugars	½ to 1 tsp	2	2

*Diets should be monitored for adequacy of iron and vitamin D intake

†Approximately ⅓ cup can easily be incorporated in a child's food during cooking

‡Liver once a week can be used as liver sausage or cooked liver.

§Should be served once or twice per week to substitute for meat

‖If child's preferences are limited, use double portions of preferred vegetables until appetite for other vegetables develops.

From Loenberg, M.E.: The development of food practices in young children, in Pipes, P.L.: *Nutrition in Infancy and Childhood,* 2nd edition. New York: C.V. Mosby Co., 1981, p. 135. Used with permission of the publisher.

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a page number followed by a "t" indicates a table; an "f" refers to a figure.

Some Abbreviations Used in the Nutrition in Primary Care Series

ATP	adenosine triphosphate
c	cup
cc	cubic centimeter
CNS	central nervous system
FDA	Food and Drug Administration
gm	gram
IBW	ideal body weight
IU	International Units
kcal	kilocalorie
kg	kilogram
lb	pound
lg	large
MCV	mean corpuscular volume
MDR	minimum daily requirement
med	medium
μg	microgram
mEq	milliequivalent
mg	milligram
MJ	megajoule
ml	milliliter
oz	ounce
RDA	Recommended Dietary Allowances
RE	retinol equivalents
sl	slice
sm	small
Tbsp	Tablespoon
TPN	total parenteral nutrition
tsp	teaspoon
USDA	United States Department of Agriculture