

Nutrition in primary care: scope and relevance of output from the Cochrane Collaboration¹⁻³

Jaap J van Binsbergen, Brendan C Delaney, and Chris van Weel

ABSTRACT There is a lack of randomized controlled nutritional intervention studies with objective clinical endpoints conducted from primary care. Therefore, evidence-based nutritional advice is hampered by 3 factors: (1) a lack of nutritional intervention studies, (2) the difficulty of translating nutritional interventions into practice, and (3) the difficulty of translating to the setting of primary care. A search was made within the publications of the Cochrane Library with potential nutritional aspects. The key words and free text words “nutrition,” “food,” “foodstuff,” “nonpharmacologic,” “weight,” “body weight,” “diet,” “dietitian,” “general practitioner,” and “family physician” were used with the Internet version of the Cochrane Library. Common clinical problems in primary care that have at least some nutritional aspects, are not currently well covered in existing Cochrane reviews. In only 6 cases was nutrition mentioned to some extent. Clinical practice could benefit from a more rigorous approach to nutritional advice. Review groups should be approached to encourage reviewers to cover these aspects in future updates. The existing “comments and criticisms” procedure available on the Cochrane website could be used for this purpose. Having a streamlined Heelsum Workshop Group, based at a university with roots within the various disciplines, linking the experience of daily practical work of the family physician is important, but a small group will need to take overall responsibility for coordination and updating Cochrane reviews on nutrition. *Am J Clin Nutr* 2003;77(suppl):1083S–8S.

KEY WORDS Nutrition, general practitioner, Cochrane, randomized controlled clinical trials, evidence-based advice, practice-based advice

INTRODUCTION

Diseases where a nutritional intervention plays a key role in management are common in family practice (1, 2). Although several national and international guidelines for the family physician (3) emphasize the importance of nonpharmacologic treatments such as smoking cessation, exercise, and good nutritional habits, these are in general poorly followed (4, 5). Most of these recommendations are based on extrapolation from population-based evidence or consensus alone (6).

A key question for family practice is whether strategies that have been shown to be effective at the population level should be deemed effective at the individual patient level. Small changes in individual behavior can have great consequences for the population as a whole and lead to measurable effects, but at an individual level this does not necessarily result in a relevant change in health status for the individual concerned—the so-called prevention

paradox (7). This tension between population benefits and individual benefits is particularly striking in the case of nutritional advice, because so much evidence is derived from population-based studies (8). For example, there is consensus in nutritional policy in industrialized societies to reduce saturated fat intake and increase the intake of vegetables, fruits, and fish. However, the effectiveness of these recommendations at an individual level is not addressed by current evidence (9).

Evidence-based nutritional advice is hampered by 3 factors: (1) a lack of nutritional intervention studies, (2) the difficulty of translating nutritional interventions into practice, and (3) the translation of interventions to the primary care setting. There is a lack of randomized controlled nutritional intervention studies with hard clinical endpoints conducted from primary care. Compared with research conducted into the efficacy and safety of drugs, which is based on clinical endpoints, the study of food and food components is much more complicated. Adding or deleting factors from the patient’s diet can be effective, but this does not result in a change in eating behavior.

Nutrition is embedded in culture, not just the patient’s but his or her family’s, and a translation must be made between healthy nutrients and a healthy diet before sustained effects on health status can be achieved. The heterogeneity of the population and the different amounts and compositions of food eaten make objective trials expensive and almost unfeasible (10). For primary care it is also necessary that this be achieved for patients and families of all social and cultural backgrounds before it can be pursued as routine care—not just for a happy few with special nutritional interests or a specific health problem. Research should also include a description of the role of the individual provider—for example, the dietitian or the family doctor—with regard to nutritional advice.

An additional problem with the effectiveness of nutrition is the delay between the application of an intervention and the observation of its effects, which may be many years. Randomized controlled trials are usually limited to a couple of years’ follow-up. Randomized controlled clinical trials alone will therefore be

¹From the Department of Family Medicine and the Department of General Practice and Social Medicine, University Medical Center Nijmegen, Nijmegen, the Netherlands; and the Department of Primary Care and General Practice Division of Primary Care, University of Birmingham, Birmingham, United Kingdom.

²Presented at the Third Heelsum International Workshop, held in Heelsum, the Netherlands, December 10–12, 2001.

³Reprints not available. Address correspondence to JJ van Binsbergen, Department of Family Medicine, University Medical Center Nijmegen, PO Box 9101, 6500 HB Nijmegen, the Netherlands. E-mail: jjvbins@knmg.nl.

insufficient to prove the effectiveness of an individual nutritional intervention on the basis of clinical endpoints alone. Pathophysiologic background knowledge leading to the development of surrogate endpoints as well as critical interpretation of observational studies must also be employed (11). Simple self-assessment tools aiming to assess intake of particular food groups may be sufficient for clinical research (9, 12).

The objective of the Cochrane Collaboration is to support the production of systematic reviews of health care interventions, which are kept up-to-date and published on the Cochrane Library. The library is available on CD-ROM and via the Internet to subscribers, either individual or institutional (and in some cases national), and is published quarterly. Reviews are produced by individuals or groups who approach the Collaboration with the intention of producing and maintaining a review. The Cochrane systematic review groups (CRGs) are "clinical system-based." They have a co-coordinator and co-coordinating editor supported by an editorial board and are responsible for recruiting, supporting, and encouraging the reviewers. Methods working groups and fields develop the methodology of systematic reviews and represent the interests of groups that run across biological systems, such as primary care and consumers. Centers act as local supports for training and administration around the world. The Collaboration is not centrally funded; each part of it is responsible for obtaining support from national funding agencies and charities. Most individuals involved in the Collaboration work voluntarily, either on their own time or with the goodwill of their academic employers.

Family physicians are involved at all levels of the Collaboration, as reviewers, editors, and methodologists. All CRGs have primary care input into their reviews where this is appropriate, facilitated by the primary care field, and many reviews are produced by groups from primary care.

Family physicians need to be involved at all levels of the "evidence cascade" to guarantee that appropriate questions are addressed and presented in an appropriate manner to practitioners. Here, primary care "specialist" societies have a key role in liaising with the CRGs and the primary care field. Participation in CRGs requires scientific skills that nonacademic family physicians may not have. But the CRGs have developed training programs and are able to support their reviewers and work with them under flexible time schedules, so it is possible for family physicians to become reviewers.

Not only the evidence of the effect of diet on health but also the possibility to tailor dietary recommendations to individuals' daily behavior should be considered. Given the importance of personal interaction, the therapeutic setting of primary care should be an ideal setting for this process, but also one that needs to be tested.

With their structured abstract, their standardized, peer-reviewed methodology, and their detailed presentation format, Cochrane reviews are seen as the "gold standard" of systematic reviews. But unfortunately these reviews are not the ideal resources to keep busy practitioners with focused and up-to-date "information bites" (13). The practical application of Cochrane reviews requires the production of specific educational material that is based on scientifically rigorous and appropriate evidence but is more appropriate for daily practice and the individual patient.

The aim of this study was to determine the evidence base of primary care guidelines for common health problems, to evaluate the extent to which the available Cochrane reviews were

used, and to assess the extent to which the recommendations were in accordance with the findings of these reviews.

POTENTIAL NUTRITIONAL FIELDS OF INTEREST: STRATEGIES

The analysis used the Dutch College of General Practitioners (NHG) standards as a case study. In 1989 the Dutch College started developing its guidelines on the diagnosis, investigation, and treatment of clinical conditions (14, 15). Today 74 guidelines have been developed (**Table 1**). The guidelines reflect the generalist nature of family medicine and cover a variety of clinical topics, reflecting the most common disorders encountered in practice. Nutrition is involved in a large number of these disorders (16), not as an isolated topic, but interwoven in the treatment and prevention of the disease: examples include nutritional intervention in chronic obstructive pulmonary disease (COPD) (17), low fat intake for diabetic patients (18), patients with liver pathology (19), and the need for nutritional support in patients with gout (20).

Most guidelines contain nutritional aspects such as avoiding obesity (angina pectoris, diabetes), restriction in salt intake (hypertension), nutritional deficiency (problematic alcohol use, cardiac failure, or COPD), dehydration (influenza, children with fever), or fat reduction (cholesterol). Poor nutritional habits due to social circumstances and limitations of locomotor apparatus (rheumatic arthritis, back and knee problems) are other examples (1).

Cochrane Systematic Reviews are produced by CRGs organized by clinical specialty (<http://www.cochrane.org>). An overview of CRGs that are potentially responsible for nutrition-related fields appears in **Table 2**. A combination of the above-mentioned NHG standards with nutritional aspects and the CRGs with a potential nutritional scope is provided in **Table 3**.

SCOPE AND RELEVANCE OF OUTPUT FROM THE COCHRANE COLLABORATION

A search was made within the Cochrane Library of the CRGs with potential nutritional aspects, as mentioned in table 3. The key words and free text words "nutrition," "food," "foodstuff," "nonpharmacologic," "weight," "body weight," "diet," "dietitian," "general practitioner," and "family physician" were used with the Internet version of the Cochrane Library. The results are summarized in **Tables 4** and **5**.

In total, 30 nutrition-related diagnoses were examined. In 24 reviews in which some nutritional input could be expected—acute diarrhea, cardiac failure, and hepatic disease, for instance—nutrition was not mentioned at all. Moreover 4 potential nutrition-related diagnoses—*anxiety*, *decubitus*, *gout*, and *renal calculus*—did not have a Cochrane review. Only 6 of the 30 selected reviews mentioned nutritional interventions, and none of these thoroughly covered the topic.

A review of interventions for COPD found no evidence that nutritional intervention made a difference (21). The cholesterol-lowering effect of reduced saturated fat intake was mentioned in relation to intervention by dietitians but not by family physicians on account of insufficient evidence (22). Because of lack of adequate data, no conclusions could be made about the effectiveness of a cholesterol-lowering diet for familial hypercholesterolemia (23).

The role of nutritional advice for patients with diabetes mellitus was underexplored. The emphasis was laid on reducing body

TABLE 1Standards from the Dutch College of General Practitioners¹

<i>Acne vulgaris</i>	Infertility
<i>Acute diarrhea</i>	<i>Influenza and influenza vaccination</i>
Acute otitis media	Insomnia and sleeping pills
<i>Acute sore throat</i>	Intrauterine contraceptive device
Allergic and hyperreactive rhinitis	<i>Irritable bowel syndrome</i>
Amenorrhea	Knee disorders (traumatic and nontraumatic in children and adolescents)
<i>Angina pectoris</i>	Knee disorders (traumatic and nontraumatic in adults)
Ankle distortion	Low back pain
<i>Anxiety</i>	Lumbosacral radicular syndrome
Asthma in adults and chronic lung failure: diagnostic	Mammography
Asthma in adults: treatment	Menopause
Asthma in children	<i>Migraine</i>
Bacterial skin infections	Miscarriage
Blood test	Neonate investigation
<i>Cardiac failure</i>	<i>Osteoporosis</i>
Cervical smears	Otitis externa
<i>Children with fever</i>	Otitis media with effusion in children
<i>Cholesterol</i>	Pelvic inflammatory disease
<i>Chronic obstructive pulmonary disease: diagnostic</i>	<i>Peripheral arterial disorder</i>
<i>Chronic obstructive pulmonary disease: treatment</i>	<i>Pregnancy and childbirth</i>
Condylomata acuminata	<i>Problematic alcohol use</i>
<i>Constitutional eczema</i>	Psoriasis
Deafness	Red eye
<i>Decubitus</i>	<i>Renal calculus</i>
<i>Dementia</i>	<i>Rheumatic arthritis</i>
<i>Depression</i>	Shoulder disorders
Dermatomycosis	Sinusitis
<i>Diabetes mellitus type 2</i>	<i>Stomach disorders</i>
Enuresis nocturna	<i>Thyroid disorder</i>
Epicondylitis	<i>Transient ischemic attack</i>
Eye diagnostic	Ulcer cruris venosum
<i>Food allergy in infants</i>	Urethritis in men
<i>Gout</i>	Urinary incontinence
<i>Hepatic disease</i>	Urinary tract infection
Herpes genitalis	Urination disorders in elderly men
Hormonal contraception	Vaginal blood loss
<i>Hypertension</i>	Vaginal flue discharge

¹Standards with nutritional aspects are italicized.

weight, and eating low-fat, high-carbohydrate meals was given secondary importance (24, 25). Similarly, for hypertension the emphasis was placed on reducing weight rather than attending to nutritional aspects such as reducing salt intake (for salt-sensitive patients) or taking potassium or calcium supplements (26). Under peripheral vascular disease the Cochrane Review reported the importance of a low-fat diet (27). In the section on pregnancy and childbirth, one review emphasized the importance of the use of folic acid in the beginning of the pregnancy (28).

CONCLUSIONS AND OBJECTIVES OF FURTHER STUDY

Our analysis pointed to problems in promoting the evidence base of primary care nutritional advice. More clinical research, based on objective clinical endpoints, is needed. But at the same time, insufficient use is being made of available data; we have highlighted the potential for improvement in this respect. Common clinical problems in primary care that have at least some nutritional aspects are fragmentarily covered in existing Cochrane reviews. Review groups should encourage reviewers to cover these aspects in future updates of their reviews. The existing "comments and criticisms" procedure available on the Cochrane website could be used for this purpose.

Unfortunately, there is still a long list of nutrition-related diseases common to primary care but not (yet) covered by any guideline: nutrition for obese patients, nutrition for patients undergoing chemo- or radiotherapy, nutrition for patients with HIV or AIDS, interaction of food and medication/drugs, and nutrition for patients facing poverty or social isolation. There is a considerable amount of work to be done. The Cochrane approach could be a suitable way to avoid duplication and promote the use of evidence in nutritional guidelines. In line with the principles of the Cochrane Collaboration (13), the Heelsum conferences form a useful international platform because all necessary core disciplines are combined: primary care providers, nutritionists, and nutrition-oriented epidemiologists. In 1995 the first international workshop was held: Nutritional Attitudes and Practices of Primary Care Physicians (29). The second conference took place in 1998: Family Doctor and Patients: Is Effective Nutrition Interaction Possible? (30). The title of the most recent conference (2001) was Nutrition Guidance of Family Doctors Towards Best Practice. The content of these workshops and the composition of their participants are in concord with the Cochrane Collaboration's 10 principles.

The 10 principles viewed from the perspective of the Heelsum conferences are as follows:

TABLE 2Cochrane Systematic Review Groups¹

<i>Acute Respiratory Infections Group</i>
<i>Airways Group</i>
<i>Anesthesia Group</i>
<i>Back Group</i>
<i>Breast Cancer Group</i>
<i>Colorectal Cancer Group</i>
<i>Consumers and Communication Group</i>
<i>Cystic Fibrosis and Genetic Disorders Group</i>
<i>Dementia and Cognitive Improvement Group</i>
<i>Depression, Anxiety, and Neurosis Group</i>
<i>Developmental, Psychosocial, and Learning Problems Group</i>
<i>Drugs and Alcohol Group</i>
<i>Ear, Nose, and Throat Disorders Group</i>
<i>Effective Practice and Organization of Care Group</i>
<i>Epilepsy Group</i>
<i>Eyes and Vision Group</i>
<i>Fertility Regulation Group</i>
<i>Gynecological Cancer Group</i>
<i>Hematological Malignancies Group</i>
<i>Heart Group</i>
<i>Hepatobiliary Group</i>
<i>HIV and AIDS Group</i>
<i>Hypertension Group</i>
<i>Incontinence Group</i>
<i>Infectious Diseases Group</i>
<i>Inflammatory Bowel Disease Group</i>
<i>Injuries Group</i>
<i>Lung Cancer Group</i>
<i>Menstrual Disorders and Subfertility Group</i>
<i>Metabolic and Endocrine Disorders Group</i>
<i>Movement Disorders Group</i>
<i>Multiple Sclerosis Group</i>
<i>Musculoskeletal Group</i>
<i>Musculoskeletal Injuries Group</i>
<i>Neonatal Group</i>
<i>Neuromuscular Disease Group</i>
<i>Oral Health Group</i>
<i>Pain, Palliative Care, and Supportive Care Group</i>
<i>Peripheral Vascular Diseases Group</i>
<i>Pregnancy and Childbirth Group</i>
<i>Prostatic Diseases and Urologic Cancers Group</i>
<i>Renal Group</i>
<i>Schizophrenia Group</i>
<i>Sexually Transmitted Diseases Group</i>
<i>Skin Group</i>
<i>Stroke Group</i>
<i>Tobacco Addiction Group</i>
<i>Upper Gastrointestinal and Pancreatic Diseases Group</i>
<i>Wounds Group</i>

¹Groups with nutritional aspects are italicized.

1. *Collaborating*. Communicating and fostering good communications, open decision making, and teamwork between nutritional scientists and family physicians worldwide can lead to a broadly supported consensus to prevent unnecessary duplication and conflict.
2. *Building on the enthusiasm of individuals*. Enthusiasm has its roots in daily practice; it develops from the involvement and support of individual practitioners of different skills and backgrounds. However, this enthusiasm may remain untapped unless the individual family physician can learn about nutrition and all evidence is available and translated into guidelines.

TABLE 3

Selected combined nutritional fields (standards from the Dutch College of General Practitioners plus Cochrane Review Groups)

<i>Acute Respiratory Infections Group</i>
<i>Airways Group</i>
<i>Dementia and Cognitive Improvement Group</i>
<i>Depression, Anxiety, and Neurosis Group</i>
<i>Drugs and Alcohol Group</i>
<i>Ear, Nose, and Throat Disorders Group</i>
<i>Heart Group</i>
<i>Hepatobiliary Group</i>
<i>Hypertension Group</i>
<i>Incontinence Group</i>
<i>Infectious Diseases Group</i>
<i>Inflammatory Bowel Disease Group</i>
<i>Metabolic and Endocrine Disorders Group</i>
<i>Movement Disorders Group</i>
<i>Peripheral Vascular Diseases Group</i>
<i>Pregnancy and Childbirth Group</i>
<i>Prostatic Diseases and Urologic Cancers Group</i>
<i>Renal Group</i>
<i>Skin Group</i>
<i>Stroke Group</i>
<i>Upper Gastrointestinal and Pancreatic Diseases Group</i>

3. *Avoiding duplication*. International comparability of scientific exertion is particularly important to maximize economy of effort and to take account of local circumstances. For reasons of culture and custom, this parallel is especially important in the field of nutrition.
4. *Minimizing bias*. Bias is one of the main problems in nutritional surveys. This may arise from differences between actual and reported food intake as well the differences between individuals with regard to pathophysiologic mechanisms and the interaction and availability of nutrients. Multi-disciplinary working groups, such as Heelsum, can provide the best environment to develop novel methods to overcome these problems.
5. *Keeping up-to-date*. As the influence of diet on disease becomes more clear, the evidence that eating a well-balanced, healthy diet helps prevent chronic illness grows daily. On the other hand, the booming market of nutritional supplements, with its enormous commercial interests, demands up-to-date scientific evidence, so that consumers are not misled by advertising.
6. *Ensuring relevance*. The relevance of the chosen nutritional topics should come straight from the daily practice of the family physician, who will evaluate health care interventions using outcomes that are of direct relevance to patients.
7. *Promoting access*. The Collaboration wants the Cochrane Library to be widely disseminated. Toward this goal it has taken advantage of strategic alliances and tried to include content and

TABLE 4

Selected standards from the Dutch College of General Practitioners with nutritional aspects and any Cochrane nutritional attention

<i>Chronic obstructive pulmonary disease</i>
<i>Cholesterol</i>
<i>Diabetes mellitus type 2</i>
<i>Hypertension</i>
<i>Peripheral arterial disorder</i>
<i>Pregnancy and childbirth</i>

TABLE 5


Selected standards from the Dutch College of General Practitioners with nutritional aspects without Cochrane nutritional attention

Acne vulgaris
Acute diarrhea
Acute sore throat
Angina pectoris
Anxiety
Cardiac failure
Children with fever
Constitutional eczema
Decubitus
Dementia
Depression
Food allergy in infants
Gout
Hepatic disease
Influenza and influenza vaccination
Irritable bowel syndrome
Migraine
Osteoporosis
Problematic alcohol use
Renal calculus
Rheumatic arthritis
Stomach disorders
Thyroid disorder
Transient ischemic attack

media appropriate for the needs of users worldwide, particularly in developing countries. On the other hand, the Collaboration must address the daily practice of family physicians. They need answerable questions and practical, relevant, computerized, or low-tech media nutritional information in their offices.

8. *Continually improving the quality of its work.* Being an expert group on specific nutritional topics from the family physician's viewpoint gives the Cochrane Collaboration an opportunity to add to existing methodological expertise while also being open and responsive to criticism. Criticism and sophistication can be brought in by additional reviews.
9. *Ensuring continuity.* A small nutrition group based at a university with roots within the various disciplines linking the experience of daily practical work of the family physician will need to take overall responsibility for coordinating and updating reviews by ensuring that editorial processes and key functions are maintained and renewed.
10. *Enabling wide participation.* A wide international participation of the various disciplines is important, as is the consideration of relevance to different socioeconomic conditions and cultures. Not only family physicians, nutritional scientists, and dietitians need a place. Epidemiologists, methodologists, statisticians, journal hand-search specialists, and consumers should be involved in the work of the Collaboration to reduce barriers to contributing and to encourage diversity.

The Collaboration is also very aware of the need to involve primary care. A primary care field was established in 1994, with the aim of adding and enhancing the primary care perspective in all relevant review groups. Cochrane reviews work from a disease-specific angle, but for primary care its focus is on individuals. Interventions, including diet, address different health problems of the same individual at different moments in time. This is particularly the case with comorbidity (2). An intrinsic characteristic of

effective intervention is consistency over time, and nutritional advice given for one health problem (eg, COPD) should not contradict dietary counseling for the next health problem (eg, diabetes mellitus). Healthy foods and other generic nutritional concepts are particularly relevant from this perspective. 

REFERENCES

1. Van Binsbergen JJ. Nutritional factors in Dutch family medicine: an inventory. *Am J Clin Nutr* 1997;65(suppl):1967S-73S.
2. Van Weel C. Morbidity in family medicine: the potential for individual nutritional counseling, an analysis from the Nijmegen Continuous Morbidity Registration. *Am J Clin Nutr* 1997;65(suppl):1928S-32S.
3. Kromhout D, Menotti A, Kesteloot H, Sans S. Prevention for coronary heart disease by diet and lifestyle. *Circulation* 2002;105:893-8.
4. Backett K, Davison C, Mullen K. Lay evaluation of health lifestyles: evidence from three studies. *Br J Gen Pract* 1994;44:277-80.
5. Leese B, Bosasquet N. Family doctors and change in practice strategy since 1986. *Br Med J* 1995;310:705-8.
6. Ulmer H, Diem G, Bischof HP, Ruttermann E, Concin H. Recent trends and sociodemographic distribution of cardiovascular risk factors: results from two population surveys in the Austrian WHO CINDI demonstration area. *Wien Klin Wochenschr* 2001;113:573-9.
7. Rose G. Sick individuals and sick populations. *Int J Epidemiol* 1985;14:32-8.
8. He J, Ogden LG, Bazzo LA, Vupputuri S, Loria C, Whelton PK. Dietary sodium intake and incidence of congestive heart failure in overweight US men and women: first National Health and Nutrition Examination Survey Epidemiologic Follow-up Study. *Arch Intern Med* 2002;162:1619-24.
9. Little P, Barnett J, Kinmonth AL, et al. Can dietary assessment in general practice target patients with unhealthy diets? *Br J Gen Pract* 2000;50:43-5.
10. Truswell AS. What nutrition knowledge and skills do primary care physicians need to have, and how should this be communicated? *Eur J Clin Nutr* 1999;53(suppl):S67-71.
11. Truswell AS. Levels and kinds of evidence for public health nutrition. *Lancet* 2001;357:1061-2.
12. Calfas KJ, Zabinski MF, Rupp J. Practical nutrition assessment in primary care settings: a review. *Am J Prev Med* 2000;18:289-99.
13. Cochrane AL. Effectiveness and efficiency: random reflections on health services. London: Royal Society of Medicine Press, 1999.
14. Thomas S. Standard setting in the Netherlands: impact of the human factor on guideline development. *Br J Gen Pract* 1994;44:242-3.
15. Grol R. Development and implementation of guidelines for family practice: lessons from the Netherlands. *J Fam Pract* 1995;40:435-9.
16. van Weel C. Dietary advice in family medicine. *Am J Clin Nutr* 2003;77(suppl):1008S-10S.
17. Schols AMWJ, Wouters EFM. Nutritional abnormalities and supplementation in chronic obstructive pulmonary disease. *Clin Chest Med* 2000;21:753-62.
18. American Diabetes Association. Nutrition recommendations and principles for people with diabetes mellitus. *Diabetes Care* 2000;23(suppl):S43-9.
19. Kondrup J, Muller MJ. Energy and protein requirements of patients with chronic liver disease. *J Hepatol* 1997;27:239-47.
20. Dessen PH, Shipton EA, Stanwix AE, Joffe BI, Ramokgadi J. Beneficial effects of weight loss associated with moderate calorie/carbohydrate restriction, and increased proportional intake of protein and unsaturated fat on serum urate and lipoprotein levels in gout: a pilot study. *Ann Rheum Dis* 2000;59:539-43.
21. Ferreira IM, Brooks D, Lacasse Y, Goldstein RS. Nutritional supplementation for stable chronic obstructive pulmonary disease (Cochrane Review). In: *The Cochrane Library*. Oxford, United Kingdom: Update Software, 2001:1.
22. Thompson RL, Summerball CD, Hooper L, et al. Dietary advice given by a dietitian versus other health professionals or self-help resources

- to reduce blood cholesterol (Cochrane Review). In: The Cochrane Library. Oxford, United Kingdom: Update Software, 2001:1.
23. Poustie VJ, Rutherford P. Dietary treatment for familial hypercholesterolaemia (Cochrane Review). In: The Cochrane Library. Oxford, United Kingdom: Update Software, 2001:2.
 24. Griffin S, Kinmonth AL. Systems for routine surveillance for people with diabetes mellitus (Cochrane Review). In: The Cochrane Library. Oxford, United Kingdom: Update Software, 2001:4.
 25. Cochrane Protocol diabetes. In: The Cochrane Library. Oxford: Update Software, 2001:4. Weight reduction for reducing mortality in obesity and overweight (Cochrane Review). Protein and energy supplementation in elderly people at risk from malnutrition (Cochrane Review).
 26. Mulrow CD, Chiquette E, Angel L, et al. Dieting to reduce body weight for controlling hypertension in adults (Cochrane Review). In: The Cochrane Library. Oxford, United Kingdom: Update Software, 2001:4.
 27. Leng GC, Price JF, Jepson RG. Lipid-lowering for lower limb atherosclerosis (Cochrane Review). In: The Cochrane Library. Oxford, United Kingdom: Update Software, 2001:4.
 28. Mahomed K. Folate supplementation in pregnancy (Cochrane Review). In: The Cochrane Library. Oxford, United Kingdom: Update Software, 2001:4.
 29. International Workshop on Nutritional Attitudes and Practices of Primary Care Physicians. Heelsum, the Netherlands, December 11–13, 1995. Proceedings. *Am J Clin Nutr* 1997;65(suppl):1927S–2022S.
 30. Truswell AS, ed. International Workshop Family Doctor and Patients: Is Effective Nutrition Interaction Possible? *Eur J Clin Nutr* 1999; 53:S1–S114.