FEATURE

Clinical nutrition in primary health care

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■ Nutritional diagnosis and management are important aspects of general practice. This information, which is presented in two parts, offers the general practitioner a practical framework and an approach to nutritional advice.

Part 1 outlines the clinical conditions and principles involved in nutritional diagnosis with a management approach to macrovascular disease and obesity.

Part 2 covers protein malnutrition, eating disorders, osteoporosis, nutrient toxicity, cancer, inherited metabolic disorders, nutrient deficiency and diabetes mellitus.

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Nutrition has always been an important component of medicine. Hippocrates had a strong interest in the subject and Maimonides, in the Middle Ages, considered diet in relation to the perceived health problems of the day.

In the long history of medical practice it is only for perhaps the last 20 or 30 years that nutrition has had a relatively minor role. Nutritional problems, especially malnutrition and infectious disease, continue to constitute the world's major health problems.

The discovery of micronutrients provoked the developed countries to extend skills in nutrition assessment and diagnosis into medical practice. The importance of nutrition in general practice has now been redefined, and alongside dermatology and psychological disorders, nutritional disorders are among the most common problems encountered by doctors. The Social Issues Committee of the Royal Australasian College of Physicians also recognises the growing importance of nutrition, and has released a report on nutrition diagnosis.

We all know that many patients come to us with their own nutritional diagnosis, with their own views and interpretations. However, the general practitioner should be able to provide competent nutritional assessment, diagnosis and management.

Table 1 lists clinical situations in which a nutritional diagnosis is required.

Why nutrition diagnosis?

The three dimensions of medical practice that concern nutrition are shown in *Figure 1*.

We often speak about the need to develop nutritional assessment skills in clinical practice. But what distinguishes those of us in medicine from other areas of health care practice? While others may make an assessment, the business of *diagnosis* is the business of medicine. That is the core of this discussion. Nutritional management flows on naturally from our ability to establish a nutritional diagnosis.

Medicine is distinguished from its alternatives by its ability to bring together different lines of information and different ways of gathering evidence before determining priorities for management.

An assessment that ultimately leads to nutritional management may have very little to do initially with nutritional assessment. A nutritional diagnosis of obe-

sity, for example, may have more to do with physical inactivity than with nutrition. Nevertheless, it has nutritional implications.

Table 2 lists the principles of making a nutritional diagnosis.

Nutrition and genetics

The interplay between genetics and food needs to be underscored at the outset. Recently, for example, the genetic basis of obesity was established by Stunkard in the Danish Adoption Study.[1] If obesity can be clearly ascribed to genetic factors, then what can be done about it? An analogy is phenyl–ketonuria, which is principally genetically determined, but its expression and its management depend very much on the way in which the food intake is controlled: this strongly genetic condition is amenable to management.

The assessment and management of lipid disorders is another example. On the one hand, familial hypercholesterolaemia is genetically determined: a condition in which the metabolic or molecular biological basis in the LDL receptor defect is now fairly well understood. That particular defect is very poorly responsive to diet and it would be foolish to suggest that that particular problem can be managed by nutritional means alone.

Nevertheless, the risk from this condition can be greatly lowered by nutritional management, irrespective of the plasma cholesterol level. At the other end of the spectrum of lipid disorders, however, are forms of hypercholesterolaemia that are very responsive to nutritional management.

The assessment of food intake

The assessment of food intake is perhaps the area in which most of us in the medical profession feel most uncomfortable. In some cases, this may be because the medical undergraduate curriculum was

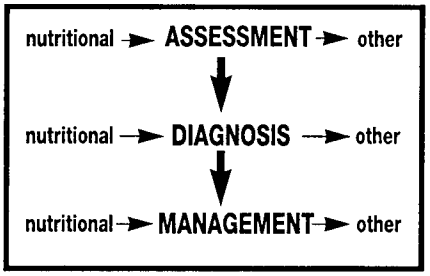

Figure 1. The three dimensions of medical practice that concern nutrition.

good on nutritional biochemistry, but did not have a lot to do with food. However, doctors are well placed to rapidly increase their skills in this area. A supplement to the *Medical Journal of Australia* (July 1989)[2] gave answers to some common questions from patients about food. It considers food technology, food composition, and disorders of taste and smell and their impact on nutritional status.

Many doctors find it difficult to get access to food composition data. In *Food Facts* published by Penguin (*Further reading*) we have arranged nutrient composition in 100 gram units so that at a glance you can see the foods that are good, poor or moderate sources of virtually any nutrient.

It is important to at least know the foods that are good sources of key nutrients. For example, there are four good sources of folic acid: green leafy vegetables, liver, citrus fruits (in order, oranges, grapefruit, lemons) and cereals (other sources of folate include nuts).

In clinical practice, there are basically two ways to assess food intake:

1. As part of general history taking, when we ask patients to run through the day from morning to evening and describe what they usually eat — it takes between 5 and 7 minutes once one gets used to the routine.
2. Ask the patient to record everything eaten for a week. We suggest that weekend days and week days both be recorded, as food intake can vary markedly as other activities vary.

TABLE 1

Clinical situations requiring a nutritional diagnosis

A nutrition diagnosis is required as part of the management of the following conditions:

- macrovascular disease
- disorders of body composition
  - — obesity
  - — energy undernutrition
  - — protein malnutrition
- eating disorders
- alcohol excess
- osteoporosis
- diabetes mellitus
- micronutrient deficiency
- micronutrient toxicity
- concerns about cancer
- inherited metabolic disorders.

Both techniques can be repeated from time to time to determine whether food intake has changed.

We have prepared simple forms that run through breakfast, morning snack, lunch, afternoon snack, dinner, supper and other times of eating. If, for example, a patient has recently developed colonic polyps, and already made some changes to diet that might not be well founded, it is easy to explore these differences and set the patient on the right track. With newly diagnosed diabetes, food intake may change by the time of further consultation: for example, the patient may eliminate all sugar, which is not particularly useful unless there happens to have been a high intake.

Alternatively, one can give patients a record sheet, or they can provide a diary of their eating activities from Monday through to Sunday. When they bring this back we recommend that it be photocopied, and a highlighting pen be used to

mark the foods that we want to see changed, making a note at the bottom of practical suggestions to effect the change.

We find that this is one of the most important things one can do in clinical practice in the process of nutrition management.

A written record, then, gives a view of the food intake and documents changes that have occurred.

Making a nutritional assessment: case study

The steps in making a nutritional assessment are:

1. understand the patient's problem or concern;
2. find out what components of the food intake are determinants of the problem;
3. make some assessment of body composition.

Other clinical tests, including functional outcomes and laboratory measurements where appropriate, may then be required.

Case study

A 42 year old business executive, married with two children, presents to the surgery. Our patient's concerns include a family history of premature coronary artery disease, a common reason for seeking a consultation these days. His father died at 43, just a year older than the patient, which stimulated him to see what he might do to avoid the same problem. This provides a powerful tool for motivating a change of diet.

On assessing his usual food intake during the consultation and then to further record it over a full week, we found he had the hallmarks of all the food intake problems that would predispose him to macrovascular disease.

Food intake was high in saturated fats, which constitutes a risk, but additionally his dietary fibre intake as an index of

TABLE 2

Principles of making a nutritional diagnosis

1. Think of food or nutrient intake as a possible explanatory model for the patient's problem.
2. Consider the importance of food intake relative to other components of diagnosis, including:
   - genetic predisposition or cause
   - other aspects of lifestyle such as physical activity, alcohol consumption, cigarette smoking and stress
   - the presence of other disease processes
   - the effect of medication
   - interaction between these factors.
3. Include the nutritional assessment as part of the overall clinical assessment.
4. Keep functional outcome, diagnosis and management in mind as you assess.
5. Involve the patient while coming to a diagnosis, explaining, clearing up misconceptions and giving practical hints about changes in food habits while this is being done.
6. Formulate the problem or sets of problems and indicate the consequences in terms of action and the time frame.
7. Develop 'clinical nutrition repertoires' for common situations such as:
   - premature macrovascular disease
   - back pain and osteoporosis
   - obesity
   - the use of nutrient and herbal remedies.
8. Try to make a formal statement, at least mentally, about the nutritional diagnoses involved.

TABLE 3

Managing macrovascular disease

- Achieve energy balance, preferably through increased physical activity — there is now much evidence to suggest that it is energy *throughput* that is most related to a reduction in cardiovascular mortality, providing that weight remains constant, and this can only be achieved by an increase in physical activity.
- Decrease the total saturated fat intake, while conserving some polyunsaturated fat intake (omega–3 and omega–6, from vegetables and fish) and monounsaturated fat intake (such as those found in olive oil and avocado).
- Decrease dietary cholesterol intake, especially in those with a serum cholesterol >5.5 mmol/L and inadequate HDL cholesterol. The effect of dietary cholesterol on serum levels is greater when it is consumed with saturated fats — the effect of an egg fried in butter is much greater than that of a boiled egg.
- Increase the intake of plant food. These foods have a high nutrient density and contain certain non nutrients like allium and saponins that may have cholesterol–lowering effects of their own.
- Increase fish intake. It is important to note that the benefits on coronary mortality may be related to total fish consumption, rather than the consumption of fish oils alone.
- Decrease the ratio of dietary sodium to dietary potassium.
- Have no more than one or two standard alcoholic drinks a day, preferably with food. Alcohol affects energy intake and increases blood pressure.

TABLE 4

Body mass index and risk implications

BMI	Grade	Implications
20–24.9	0	
25–29.9	I	Increased risk
30–39.9	II	Obesity
>40	III	Morbid obesity

plant food intake was low. Saturated fat intake is often accompanied by increased sodium and low fibre intake.

Because people often follow their family tradition, it is important to work through their food practices, their recipes, the things mother did, the things that the spouse now does. In this case, there was a need to progressively reduce saturated fat. His intake of fish was low: an increase in fish intake has emerged as a protective factor against premature coronary disease and death.

It is remarkable how little fish most Australians actually eat, and it may even have been lower had it not been for the Catholic tradition of Friday fish. For people who have no fish, the risk of cardiovascular disease is significantly increased, and even one meal of fish a week may considerably reduce the risk of cardiovascular disease.

The patient's body composition was assessed: the body mass index (described below) was 33 and his waist–hip ratio 1.2, both being significant risk factors for cardiovascular disease. A waist–hip ratio above about 0.9 for men and 0.85 for women is now recognised as a key risk factor for cardiovascular disease (both coronary and cerebrovascular), together with the expression of non–insulin dependent diabetes mellitus.

The appropriate investigations in this case are blood lipids. Measuring HDL cholesterol is necessary, otherwise it is difficult to make sense of the lipid values. One also needs to assess, and exclude where appropriate, secondary hyperlipidaemia.

The final picture is one of premature vascular disease with a strong family history, hypercholesterolaemia, abdominal obesity, and a food intake that is high in saturated fat from dairy foods and meat, and little physical activity.

Nutritional management

The nutritional approach to the management of macrovascular disease in this example is shown in *Table 3*.

In managing diet in relation to macrovascular disease, the general practitioner should be able to answer questions such as:

- What are the major sources of fat in the Australian diet?
- How safe is it to reduce the intake of dairy products?
- How valuable are plant and fish fats in the diet?
- What are the sources of sodium in the diet?
- How can food affect macrovascular disease and its outcomes?
- When are blood tests necessary for nutritional intervention?

Obesity

Assessment

Obesity is present when the fat mass of an individual is increased to a level where there is a likelihood of impairment of health. The easiest clinical assessment of obesity is by use of the body mass index:

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

Garrow[3] has produced a simple classification of the body mass index associated with the relative degree of risk increase (*Table 4*).

Of course, the BMI needs to be assessed in the context of the patient's phys-

ical activity. It is possible for a sedentary individual to have a BMI within grade 0, but nevertheless to have a raised fat mass and a lowered lean mass. Conversely, an active sportsman may have a raised BMI because of a raised lean body mass.

Recently it has become obvious that the distribution of body fat is as important a risk factor as its total amount.

Abdominal fat increases risk for total mortality, coronary artery disease, hypertension and non–insulin dependent diabetes mellitus. It is most easily assessed clinically by measuring and comparing body circumference around the waist and the hip. A ratio greater than 0.9 indicates the presence of abdominal obesity.

Nutritional assessment in a patient with obesity, involves the following processes:

- define the problem by measurement of body mass index and body circumferences;
- assess the evolution of the problem in this particular patient;
- determine the motivation of the patient for seeking help in the management of his or her problem;
- identify changeable behaviours in relation to food and physical activity.

Diagnosis

Once assessment is complete, it is possible to state a formal diagnosis, for example: "Obesity grade II with a major contribution from physical inactivity, and with a component of the weight increase due to binge eating and winter depression".

Management

Management of obesity involves the following steps:

1. Establish short and long term goals, which will involve 'contracts' by both the patient and the physician.
2. Consider endpoints other than weight change as management outcomes. These can include:
   - a change in body composition, as evidenced by a change in fat distribution that may occur even without a large change in total weight;
   - adoption of lifestyle changes, such as cessation of cigarette smoking or by increasing physical activities;
   - change food intake in directions known to be associated with less risk;
   - understand and develop changes in food purchasing and preparation habits.

References

1. Stunkard A J, Sorensen T I A, Hanis C et al. An adoption study of human obesity. New Eng J Med 1986; 314:193–198.
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Further reading

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■ Reprint requests
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