DIETS FOR HYPERLIPIDAEMIA

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INTRODUCTION

Hyperlipidaemia, and particularly a raised cholesterol level, is one of the major risk factors for coronary heart disease (CHD). The European Atherosclerosis Group has suggested that cholesterol levels greater than 5.2 mmol/l need attention. The British Cardiac Society has recommended that individual advice should be given at levels over 6.5 mmol/l. The proportion of the British population with cholesterol levels greater than these cut-off points is shown in Figure 1. This indicates that the majority of the population has plasma cholesterol levels which are too high by the standards of the European Atherosclerosis Group and supports the recommendations by the World Health Organisation that dietary changes are needed for the population as a whole. The distribution of plasma cholesterol levels among 25- to 59-year-olds found in the British Lipid Screening Project is shown in Figure 2. This study gave a normal or reference range (two standard deviations above and below the mean) of 3.5 to 8.0 mmol/l.

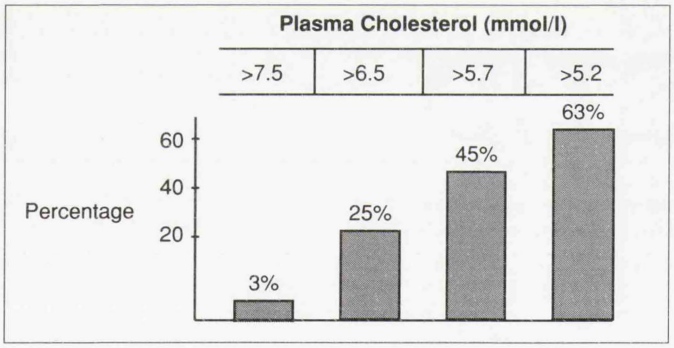


Fig 1 – Plasma cholesterol levels in British population

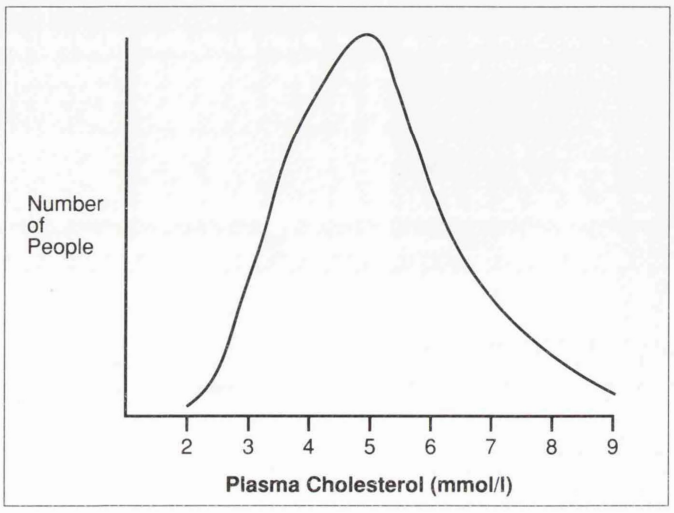


Fig 2 – Distribution of plasma cholesterol concentration found in British Lipid Screening Project (Manon, J et al BMJ 1984: 296: 1702-6)

Dietary advice given by the Nutrition and Dietetics Department of Lancaster Health Authority is based on general healthy eating advice for the population as a whole and for those who have been screened and found to have a total cholesterol level from 5.2 to 6.5 mmol/l (Table 1). Those with total cholesterol greater than 6.5 mmol/l are advised on a much stricter low fat diet.

LIPID LEVELS REQUIRING DIETARY TREATMENT

Lipid Level	Dietary Treatment
Total cholesterol 5.2 – 6.5 mmol/l	Prevention/treatment of obesity Healthy eating advice
Total cholesterol >6.5 mmol/l	Prevention/treatment of obesity Strict low fat diet (detailed later in article)
Fasting triglycerides >2.5 mmol/l	Prevention/treatment of obesity Reduce alcohol intake Reduce sugar and refined carbohydrate

Table 1

GENERAL HEALTHY EATING ADVICE

This is an extension of the 'healthy eating' guidelines endorsed by the Committee on Medical Aspects of Food Policy (COMA). It is aimed at the population as a whole, but may be applied to individuals with a plasma cholesterol of 5.2 to 6.5 mmol/l.

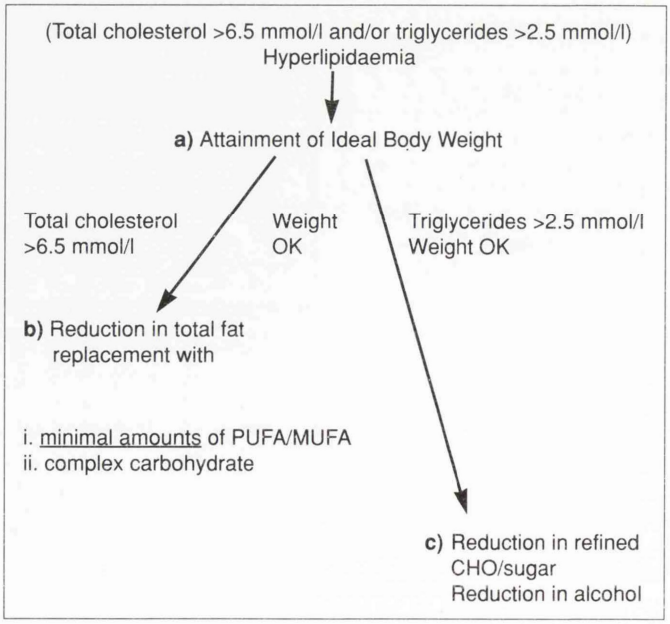


Fig 3 – Dietary principles for the treatment of hyperlipidaemia

- attainment of ideal body weight
- reduction of total dietary fat
- increase in dietary fibre (found in association with complex carbohydrate)
- moderation of alcohol intake
- reduction of refined carbohydrate and sugar intake

Patients with a cholesterol over 6.5 mmol/l and/or serum triglycerides over 2.5 mmol/l need a more rigorous regime as shown in Figure 3.

ATTAINMENT OF IDEAL BODY WEIGHT

The patients should be encouraged and helped to identify the most significant sources of energy in their diet and to concentrate on eliminating them. The main energy sources in the western world are fat (particularly saturated fats (SFAs) of animal origin) and refined carbohydrates (sugar and glucose syrup).

Weight loss can often be achieved by concentrating on these two aspects of diet alone. We are fortunate in that there are now many low fat and sugar-free alternatives to most foods traditionally high in these (see Figures 4 and 5). Their existence helps patients to diet effectively with the minimum change in their eating habits and meal patterns, thereby increasing compliance and helping to avoid some of the potential nutritional problems associated with avoidance of staples of the diet (as discussed later in this article).

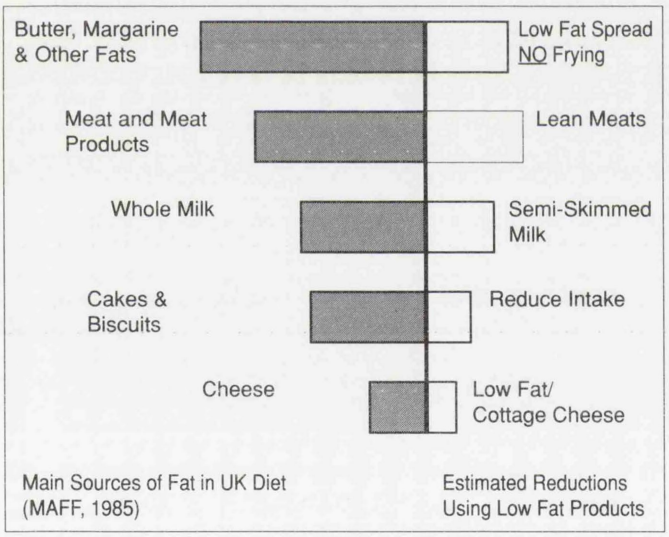


Fig 4

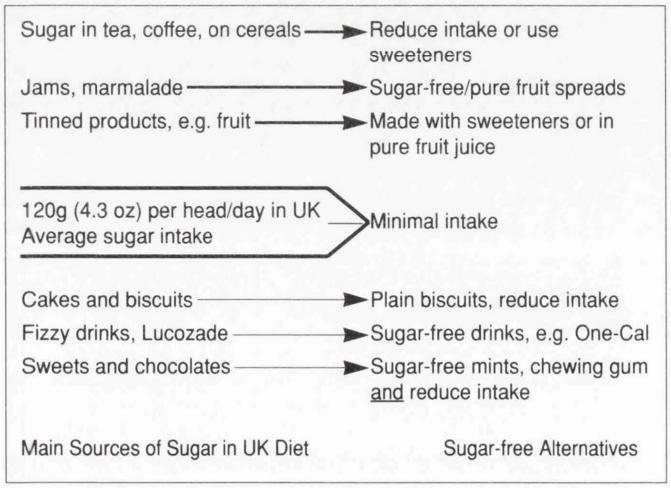


Fig 5

Problems can occur when the rate of weight loss expected by patients and/or health care professionals is unrealistic. We encourage a target of 1-2 lb a week (Figure 6).

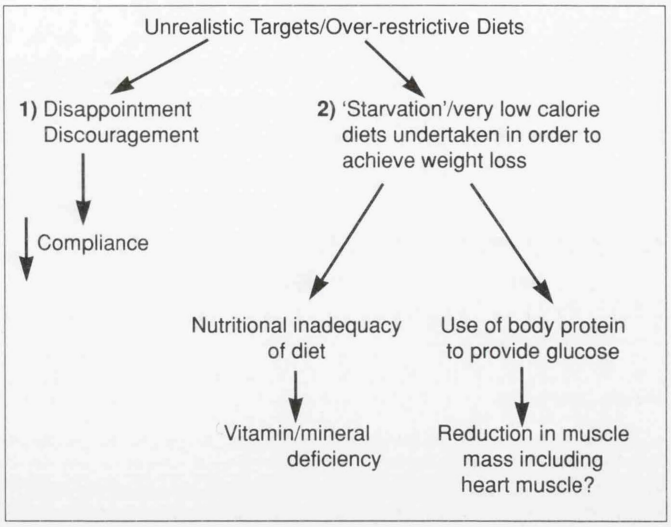


Fig 6 – Consequences of Unrealistic or Over-Restrictive Dietary Advice

Over-restrictive diets may be given where the patient's level of activity and metabolic rate are not taken into account. While diets supplying 1000 Kcal or less daily may be appropriate for the inactive and elderly, they can represent too drastic a change for younger and more active patients, again leading to lack of compliance or an inadequate nutritional intake.

REDUCTION IN TOTAL FAT

Where body weight is normal the emphasis is still on reduction in total fat intake. To avoid weight loss energy intake is maintained by:–

- increasing starchy/complex carbohydrate foods eg bread, potatoes, fruit, cereals, milk and pulses

- replacing some SFAs with polyunsaturated fatty acids (PUFA) and monounsaturated fatty acids (MUFA) eg change from butter to a low fat spread used sparingly. It is wrong to replace all SFAs with PUFA/MUFA products. eg swapping vegetable oil for lard without reducing the quantities

CONTROVERSIAL ASPECTS

MUFA (Monounsaturated Fatty Acids) and Olive Oil

Most recent evidence suggests an advantage of MUFA over PUFA products in that the former:–

a) Leave HDL unaffected; PUFAs lower both total and LDL cholesterol.

b) MUFAs (as olive oil) have been used as a staple in Mediterranean diets for centuries, in populations with relatively low incidences of CHD; PUFAs have not been consumed at their present level by large populations for more than 10 years and there is speculation as to their possible adverse effects. On the other hand PUFAs are cheaper and more available.

We would repeat our emphasis on the reduction of total fat and would recommend either as an alternative to SFAs with the proviso of minimal replacement (see previous section).

Fatty Fish/Cod Liver Oil

The value of the fats in such fish as mackerel, sardines and kippers is related more to their effects as antithrombogenic agents than to any lipid lowering properties. They would appear to be valuable in reducing the risk of CHD when taken as part of a low SFA diet and can be recommended on the basis of this as a healthy alternative to red meats. However they are much higher in calories than white fish and should be taken in moderation especially by the overweight.

Fibre and Oats

There are broadly speaking two classes of fibre.

a) Insoluble fibre is found in association with whole wheat products such as wholemeal bread or wheat cereals. It should be noted that this type of fibre has no known effect in lowering plasma cholesterol; it is however, useful in increasing satiety as part of a weight reducing diet.

b) Soluble fibre is found in oats, fruit, vegetables and pulses or beans. Evidence is not entirely conclusive as to the mechanism or effect of insoluble fibre in lowering plasma cholesterol. We recommend the use of all of the foods containing soluble fibre as part of a low fat/weight reducing diet.

It should be noted that insoluble fibre, commonly prescribed as a treatment for constipation and diverticulitis, can in fact exacerbate these conditions if the patient's fluid intake is not also increased.

POTENTIAL NUTRITIONAL PROBLEMS AND THEIR PREVENTION

The most significant problem in people who have been told they have a high cholesterol level is that they often become too restrictive with their diet and 'go over the top'. Their high motivation to change their eating habits is very useful in most cases as they do not usually need a lot of encouragement to make the changes advised. In some people however, this can cause nutritional problems as the foods which are often avoided in order to reduce fat intake are sometimes also very good sources of other nutrients which are essential for good health. It is, therefore, just as important to tell somebody what they can, and should, eat as to tell them what not to eat. Essentially, anybody advising a person on a lipid-lowering diet must ensure that the 'right' foods are eaten in sufficient quantities. It is not enough just to check that foods which are high in saturated fat are avoided.

Calcium

This is a particularly vulnerable nutrient at present as dairy products have got a 'bad name' for being high in fat, but they are also the main source of calcium in the UK diet. A decrease in dairy products therefore inevitably leads to a decrease in calcium intake.

In addition one of the main target groups for healthy eating advice, to reduce the risks of CHD in later life are young adults and teenagers. A good intake of calcium is very important at this stage of life, especially for women and girls. There is evidence that a high calcium intake in children and young adults can protect against osteoporosis as maximum peak bone mass is obtained.

This is not a difficult problem to solve if, instead of the emphasis being on reducing the intake of milk, people are encouraged to switch from full-cream milk to skimmed or semi-skimmed milk and take more low fat yoghurt. It may also be necessary to encourage people to drink more skimmed or semi-skimmed milk than at present. This is particularly true for adolescents who have a very high requirement for calcium, but studies have shown that they drink very little, preferring fizzy drinks.

This is just as important for people with hyperlipidaemia who often stop dairy products completely. They need to be encouraged to re-introduce milk into their diet and/or substitute other good sources of calcium. Many people believe that full-cream milk has more calcium than skimmed milk and this misconception needs to be corrected.

Iron

Diets for hyperlipidaemia can often be short of iron. Many people are told to cut out red meat completely. Also, many old diet sheets still advise people not to eat liver because it is high in cholesterol. This is no longer thought to be necessary as plasma cholesterol levels are affected mainly by saturated fat intake. Dietary cholesterol has little effect at low intakes of saturated fat. This creates a lot of confusion among patients as they are told, or read, conflicting advice from different sources. We encourage people to eat liver more often as it is a very good source of many nutrients.

Our hyperlipidaemic patients are also advised to eat lean red meat 3 × 3oz per week and 2 eggs per week to ensure an adequate intake. Other sources of iron are advised for people who do not wish, or are not able, to eat liver, meat or eggs.

Vitamin A

Many of the foods restricted on a low fat diet include those which are good sources of vitamin A. Liver is the best source, however, and should be encouraged for its vitamin A content as well as for iron. A regular intake of liver twice a month will prevent vitamin A deficiency.

An increased intake of red and dark green vegetables is also advised for their high carotene content which can be converted to vitamin A. Another major source of vitamin A is polyunsaturated margarine which usually has vitamin A added to it and so people who are eating dry bread should be advised to use a thin scraping of polyunsaturated margarine. Kippers and mackerel will also contribute to vitamin A intake although their vitamin A content is not high. The same is true of the 2 eggs allowed per week.

Vitamin and Mineral Supplements

These should not be necessary if the foods to be eaten in moderation are eaten in the quantities advised. Where people are unable, or unwilling, to do this, supplements may be

necessary to prevent deficiencies. However, the administration of one mineral or vitamin can interfere with the absorption or metabolism of others so supplements should only be used as a last resort or further problems can be created.

DIETETIC ADVICE

In order that comprehensive, detailed and appropriate advice is given to individuals with hyperlipidaemia it is recommended that all patients with total serum cholesterol levels greater than 7.8 mmol/l and triglyceride levels greater than 2.5 mmol/l are referred to a dietitian at the hospital or in the community, at health centre or GP practice clinics.

It would also be sensible to refer patients whose lipid levels have not responded to advice from the doctor or practice nurse, in order to check whether the diet can be improved further.

Introductory and general advice should be given by the doctor or practice nurse but more detailed advice designed to meet individual's nutritional, social and emotional needs can only be given by a dietitian. It is not easy to change 'life-long' dietary habits and certainly does not happen if we simply give out 'diet sheets'.

Patients need a lot of support and an opportunity to ask questions in order to 'stick to the diet'!

FURTHER READING

1. Ball M, Mann J. Lipids and Heart Disease: A Practical Approach. Oxford University Press, 1988.

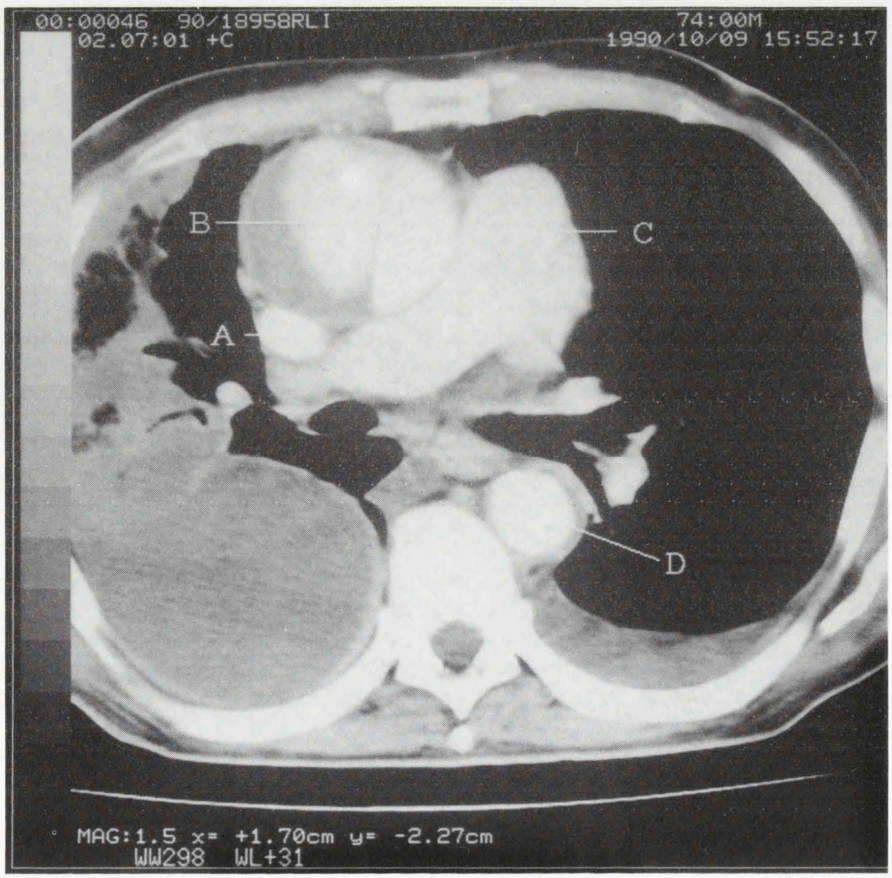
2. Thomas B, ed. Manual of Dietetic Practice. Blackwall Scientific Publications, 1988.

3. Rivers et al. Polyunsaturates. A Review of their Role in Health and Nutrition. Butter Information Council.

4. Passmore R, Eastwood M.A. Human Nutrition and Dietetics, 8th Ed. Churchill Livingstone, 1986.

5. Paul AA, Southgate DAT. The Composition of Foods, 4th Ed. MRC Special Report No. 297. HMSO, 1978.

QUIZ



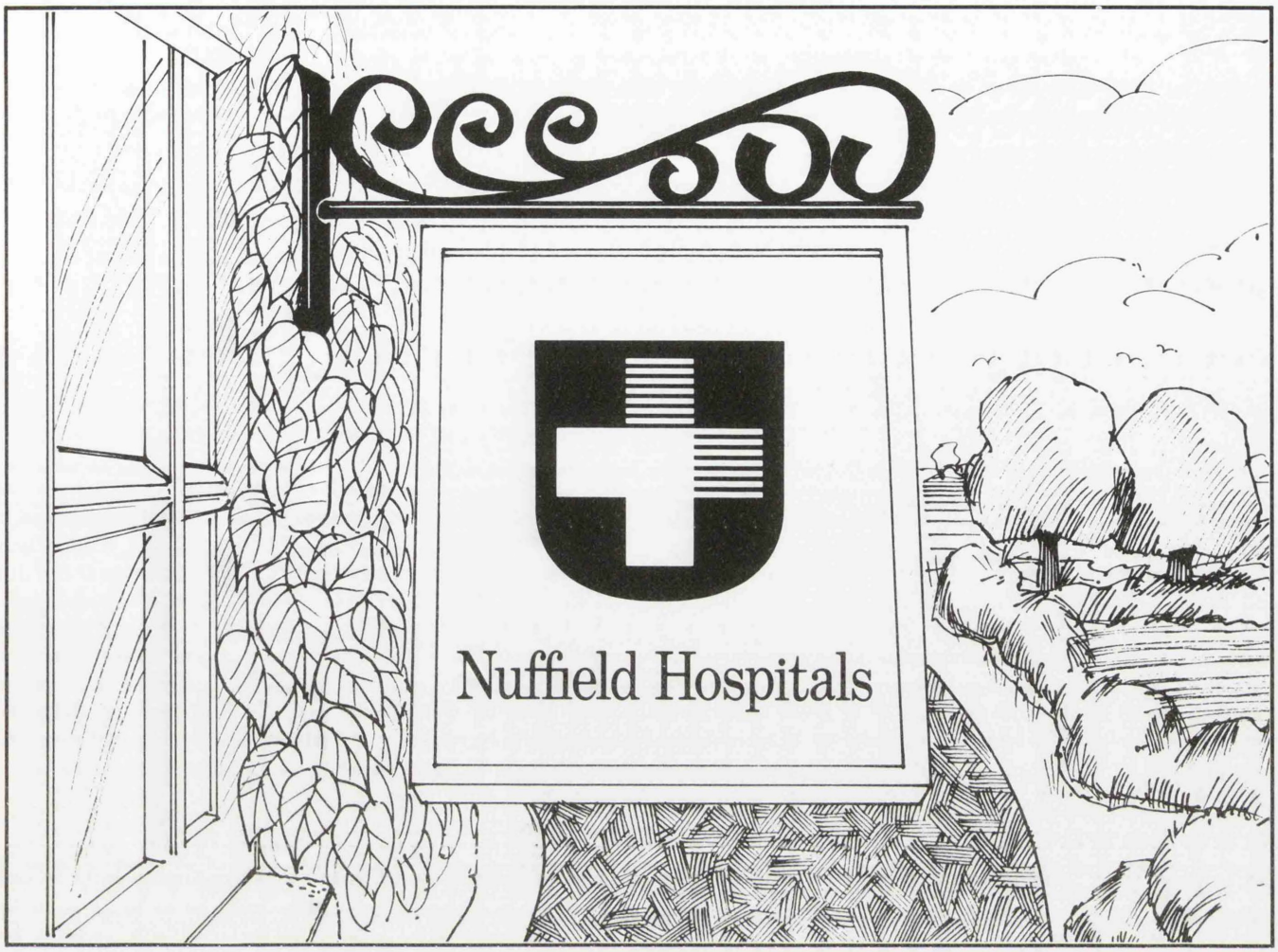
Questions

1. What is this examination?
2. What are the structures marked A, B, C, D?
3. What abnormality is shown in B?
4. What other abnormalities are shown?

Answers on page 110

GUIDELINES FOR TREATMENT OF HYPERLIPIDAEMIA AND REFERRAL TO SPECIALIST CLINIC

LIPID	ACTION
CHOLESTEROL Cholesterol > 8.5 mmol/l	Refer to appropriate specialist clinic
Cholesterol 6.5 – 8.5 mmol/l	– Diet for 3 months – Refer to appropriate group or counsellor for regard to other risk factors If cholesterol > 7.8 mmol/L – refer to dietitian <u>After 3 months</u> 1. Repeat fasting blood test, request Total, HDL and LDL cholesterol and triglycerides 2. If adequate drop in cholesterol – some fall in weight – changes made to diet and lifestyle – continue for another 3 months 3. If no fall in lipids check for underlying contributory cause, such as – hypothyroidism, diabetes, liver disease, renal disease. If any of these are present treat or refer to hospital. – If no underlying cause – continue for another three months – refer to dietician if not already done. <u>After 6 months</u> i If no drop in lipid levels following weight loss and changes in lifestyle refer to specialist clinic prior to commencing drug therapy. ii If no drop in lipid levels and no change in lifestyle or weight decide on appropriate action for particular individual, e.g. counsel. iii If adequate drop in lipids and weight, continue. Advise whether further weight loss is required or not (based on Body Mass Index) Low Fat Diet for lipid control should continue if need to lose weight or not.
Cholesterol 5.2 – 6.5 mmol/l	Give general dietetic advice (healthy eating), to include – – reduction in total fat, particularly saturated fat – increased fibre intake – from wholegrain cereals, fruit and vegetables – prevention of obesity – modification of alcohol intake
Total Cholesterol < 5.2 mmol/l Low HDL Cholesterol	1. Check level of exercise – encourage exercise 2. Stop smoking 3. Increase monunsaturated fat in diet, e.g. olive oil 4. Check for diabetes
TRIGLYCERIDES Triglycerides > 5 mmol/l (FASTING)	Refer to appropriate specialist clinic and to dietitician (Consultant may do this).
Triglycerides 2.5 – 5 mmol/l	1. Treat with diet. This should include: – increase fibre – reduce refined carbohydrates – reduce alcohol intake – treatment of obesity 2. <u>After 3 months</u> 1. If triglycerides remain 2.5 – 5.00 mmol/l investigate underlying causes such as – diabetes, hypothyroidism, etc. If any of these are present treat, or refer to hospital. If none present continue for further 3 months. Refer to dietitician if not already done so. 2. If some fall in triglycerides and weight, and changes in diet and lifestyle, continue for another 6 months <u>After 6 months</u> i. If no drop in triglyceride levels but fall in weight and change in lifestyle refer to specialist clinic prior to commencing drug treatment ii If no drop triglyceride level and no change in diet or weight decide on appropriate action for individual, e.g. counsel iii If adequate drop in lipids and weight, continue. Advise whether further weight loss is required or not (based on Body Mass Index) Low Fat Diet for lipid control should continue if need to lose weight or not.
COMBINED HYPERLIPIDAEMIA Cholesterol > 6.5 mmol/l Triglycendes > 2.5 mmol/l	– Manage along guidelines for individual lipids



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