ommendations are accepted for children under 5, but the timing of when to introduce two of the proposals—reducing the proportion of total food energy that is fat and increasing fibre—is disputed.

In a nutshell, the problem is how to change the diet of an unweaned baby—whether breast or bottle fed—from a fibre free, high fat intake (50% food energy as fat) to a high fibre, low fat diet by 5. Paediatricians and paediatric dietitians believe that this should happen gradually because full cream milk is important in the diets of young children; they are concerned about offering babies and young children skimmed or semiskimmed milk and bulky high fibre, low energy dense foods.⁵ They fear that such diets may lead to inadequate energy intake and undernutrition in some children, possible deficiencies of fat soluble vitamins, and diarrhoea in toddlers because of the more rapid gastric emptying with low fat foods.⁶ They are also concerned about the difficulty of devising acceptable diets for toddlers that are high in fibre and low in fats. The panel on child nutrition of COMA shares these concerns and has recently proposed guidelines roughly in line with them.⁷

The more radical approach is based partly on the desirability of the whole family sharing similar diets and eating similar foods. There is also the argument that the earlier changes are made the more likely they are to become permanent. Ultimately pressure for changes in childhood nutrition comes from the belief that it will lead to better adult health, but data to support this are lacking.

The Bogalusa study, a long term longitudinal study of cardiac risk factors in children, has shown that risk factors for heart disease are present in children and increase through adolescence into early adult life.⁸⁻¹⁰ Childhood obesity, for example, predisposes to adult obesity but accounts for only a small proportion of it.¹¹ What neither the Bogalusa nor other studies have yet shown is that dietary manipulation at an early age will reduce the later prevalence of hyperlipaemia and cardiovascular disease in an unselected population.¹²⁻¹⁵ A recent study linked cardiovascular disease with early undernutrition rather than excess fat intake,¹⁶ although whether that study has identified independent “markers” of disadvantage rather than a causal relation is not clear.

What advice should be given to the parents of young children? Infant formula should continue as the “milk” element of the diet until about 1 year, and by then most of the diet will be solid food and a switch to whole cows’ milk will not add to the total fat intake. Progressive reduction of milk fat as a proportion of energy needs during childhood would ensure that the COMA goals would be reached by 5, without resorting to skimmed milk, particularly if vegetable rather than animal fats were used in solid foods. Fibre can be gradually increased, and the policy of “no added salt after cooking” seems sensible for the whole family. No one can argue with the principle that obesity should be avoided by ensuring adequate physical activity as well as watching the child’s diet.

Until there is clearer evidence on the importance of early diet on later health dietary advice for children under 5 should not be radically changed.

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The unacceptable face of tipping

Lying head down over a bed once or twice a day for 20 minutes is an exercise that few doctors would find time to adopt unless the rewards were appreciable, so it is hardly surprising that many patients with chronic suppurative lung disease find postural drainage unpleasant and difficult—as do their spouses.¹ Postural drainage is widely prescribed to help drain excessive lung secretions and has been a mainstay of treatment since at least the 1920s.² But is it adhered to, does it work, and if so when?

Two studies suggest that compliance is poor.^{3,4} Forty per cent of patients with cystic fibrosis or their parents admitted to lapses of greater than one month in carrying out prescribed chest physiotherapy, and compliance deteriorated as patients grew older.³ Almost half of 50 consecutive patients attending a clinic with a particular interest in suppurative lung problems said that they performed postural drainage less often than instructed; they did not have the time and found postural drainage distasteful, uncomfortable, and occasionally painful.⁴ Patients with less severe disease and smaller sputum volumes were more likely to default. Independent confirmation of compliance is difficult to obtain, and both studies relied on information from the patients. Since, in addition, one study was of motivated patients and the other of patients attending a highly specialised unit the results are probably a considerable overestimate of general compliance.

Does postural drainage work? Most studies have looked at it together with chest physiotherapy and in the short term the combination increases the clearance of lung secretions, as measured by radiotracer techniques,⁵⁻¹⁰ improves airway function,¹¹ and increases the amount of sputum expectorated at least in patients producing 30 ml or more daily.^{7,8,10} Patients with little sputum do not benefit,¹² and those with pneumonia may deteriorate.¹³ The increase in sputum volume occurs at the time of postural drainage, and whether there is an increase in 24 hour sputum production or simply a change in the time at which sputum is expectorated is less clear.¹⁴ Attempts to separate the contribution of the various components of physiotherapy suggest that postural drainage, when coughing is allowed, increases sputum production⁷

but that chest percussion adds little to postural drainage⁹ and may even be detrimental by increasing airflow obstruction.¹⁵

Since patients dislike postural drainage and compliance is poor we should consider whether it can be replaced by alternative techniques. Vigorous coughing was more effective than postural drainage in only one study of patients with cystic fibrosis and as effective as postural drainage plus the full physiotherapy regimen given by a physiotherapist.⁸ The forced expiratory technique increases sputum production and clearance of secretions when carried out in the upright position, although postural drainage appears to confer further benefit in patients with copious sputum production.¹⁶ Adding a positive end expiratory pressure mask to the forced expiratory technique was, however, more effective than postural drainage in one study of patients with cystic fibrosis.¹⁷ Other recent approaches include attempting to increase mucus clearance with high frequency chest wall compression^{18,19} and high frequency oscillations at the mouth,²⁰ but it is too early to know whether they will be adequate substitutes for postural drainage.

Most assessments of postural drainage and other manoeuvres have concentrated on short term results, such as sputum volume at the time of intervention and lung clearance over the next few hours. Clearance of sputum is valuable, however, only if it provides symptomatic relief or long term benefit. We can assume that symptomatic benefit is small because of the poor compliance. Although virtually all patients with cystic fibrosis develop progressive impairment of pulmonary function, this is not the case for other forms of bronchiectasis. We know little about the course of patients with chronic purulent sputum production; but one study assessed 116 patients with proved bronchiectasis 14 years on average after presentation, and 30% were better than at diagnosis and only 11% were worse.¹ The decline in forced expiratory volume in the first second was no greater than expected in 80% of patients, and only 5% showed rapid deterioration.

The important unanswered questions are whether the deterioration in airway function is caused by the purulent sputum and whether removing the sputum or clearing infection slows deterioration. Organisms and inflammatory cells in purulent sputum release a complex mix of biologically active substances, including proteolytic enzymes and superoxide radicals.²¹ Cole and colleagues have suggested that a vicious cycle may develop in which sputum retention damages the bronchial wall, which in turn leads to further sputum retention.²² Long term studies are needed to see whether reducing the bacterial load alters the course of chronic suppurative lung disease and what contribution postural drainage and other physiotherapy manoeuvres make. With-

drawing postural drainage for three weeks worsens airflow obstruction in cystic fibrosis,²³ but the long term effects in other forms of chronic lung suppuration are less clear.

Postural drainage should probably be reserved for patients with airflow obstruction who produce more than 30 ml sputum daily and for those with cystic fibrosis. Postural drainage with vigorous coughing could probably be replaced by an alternative procedure if it is as effective in removing sputum. But other treatments—such as stopping smoking and using bronchodilators, antibiotics, and steroids—are at least as important for most patients.

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