which hurts the patients and violates the ethics of all good doctors. To provide a true crossroads, now that so many are wedded to the primrose path, will take a great deal more than oratory.

A viable format

Firstly, the planners, the economists, the actuaries, and the lawyers have to sit down with the doctors and devise a new format, shorn of expensive bureaucracy, which is more efficient, competitive, and, in the long run, cheaper. This then has to be sold up-hill to those who will fear losing their mess of pottage in any transition, and this would obviously mean many of the senior doctors approaching pensionable age. Adequate provision for full-time academics and research workers has to be worked out. At the same time the public has to be convinced that the new system would be a better method of providing

medical care. Supervised competition means good and prompt service. The patient is much more in control than the civil servant administrators. The public also have to be shown that those in true need would be adequately subsidised.

Finally, and perhaps most difficult of all, the profession must be convinced to unite behind the idea of such an organised system of national health insurance and behind one organisation as their leader and spokesman. Should these steps be achieved, the politicians will follow.

The work involved, the amount of persuasion needed, the quality of leadership demanded are obviously far greater when one has to change the direction of a system already well entrenched than if one is building anew. Whether the British profession wish to consider this or to pursue their present course is nothing to do with a Canadian commentator, but only when such a viable alternative is hammered into shape and is available to most of the British public will the medical profession truly be at the crossroads.

Today's Treatment

Diseases of the alimentary system

Acute diarrhoea in adults

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British Medical Journal, 1976, **2**, 1240-1242

The treatment of diarrhoea includes three major elements: symptomatic, supportive, and specific. Specific treatment will depend on an accurate aetiological diagnosis, and it is only realistic to accept that in most brief episodes of diarrhoea the cause is not found. For this reason symptomatic and supportive treatment are especially important—all the more because most acute episodes of diarrhoea are self-limiting, and the patient will have recovered before rational specific treatment based on a correct diagnosis can be started.

Symptomatic treatment

Symptomatic treatment aims to stop the diarrhoea or at least reduce its severity. The traditional remedies are kaolin mixture and chalk mixture. Although they are often said to absorb "toxins" from the gut, there is little evidence to support this. The morphine present in the chalk and opium mixture and kaolin and morphine mixture acts only via the bloodstream after being absorbed from the bowel, and not by a local effect on the gut wall. As the kaolin and morphine mixture contains only 0.7 mg of morphine in 10 ml, the amount of morphine in normal

doses is therapeutically unimportant. Chalk and opium mixture contains 5 mg of morphine in 10 ml and a small but useful pharmacological effect might result from the opium absorbed.

Codeine is of little use in controlling acute diarrhoea, but it has a place in the symptomatic treatment of chronic diarrhoea. An adult dose of up to 60 mg four-hourly may then be used.

Morphine by injection produces good symptomatic relief in acute diarrhoea associated with pain, but its use should be confined to patients with severe symptoms, such as in severe bacillary dysentery. It is usually unnecessary to give more than two or three doses. Because it may be habit forming it has no part to play in treating chronic diarrhoea.

Diphenoxylate with atropine (Lomotil) is popular nowadays, especially for keeping the patient with mild diarrhoea of short duration ambulant. The dose is two to three tablets (each contains 2.5 mg diphenoxylate) immediately, then one to two tablets six-hourly. The drug depresses the central nervous system and should not be given at the same time as other sedatives; it can potentiate the effects of alcohol dramatically. Because of its depressant effects it is no longer recommended for children. It should not be given for more than five days and has no place in prophylaxis. The side effects of diphenoxylate—mainly drowsiness, dizziness, depression, and nausea—may be troublesome. The drug is related to morphine, so that long-term administration may cause habituation. Over-dosage may cause coma and respiratory depression, reversible by nalorphine. A dose of only six tablets in a 2-year-old child led to coma and respiratory and cardiac arrest, so that patients given the drug must be told of the importance of keeping it away from children. Diphenoxylate is contraindicated if liver disease is present.

Hydrophilic substances given by mouth will absorb water from a liquid stool and themselves swell and add body to the faeces.

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Examples of such substances are a powder containing psyllium hydrophilic mucilloid and dextrose (Metamucil), methylcellulose granules, ispaghula husk (Isogel), and various preparations of sterculia. Their main use is in the symptomatic management of chronic diarrhoea and in patients with ileostomies, and they are not usually helpful in treating acute diarrhoea.

Supportive treatment

Supportive treatment is directed towards controlling the secondary ill effects produced by the diarrhoea itself, primarily loss of water and electrolytes. All patients with diarrhoea lose excess water and electrolytes, and while they should be encouraged to drink water—which will replace water loss adequately provided vomiting is not present—water alone is not enough except in mild cases. For mild to moderate acute diarrhoea half physiological saline (or its equivalent) is an adequate replacement fluid. This strength of brine, about 0.45%, is not strong enough to cause nausea, and if renal function is normal it is sufficiently concentrated to keep pace with salt loss. It may be given by diluting physiological saline with an equal volume of water, and need not be sterile when given by mouth. This is an extravagant way of preparing the solution, however, and it is much more economical to advise the patient to drink water with one level medicinal teaspoon (5 g) of table salt dissolved in 1.25 l (two pints) of water. This slightly salty beverage may be made much more palatable by adding concentrated fruit cordial. The flavour combination of salt and lime juice is so palatable that it is widely drunk from choice in SE Asia. The use of a fruit cordial as an additive has the further advantage that fruit juices contain potassium in a palatable form.

A saline solution suitable for oral fluid and salt replacement may also be made acceptable by using meat extract such as Bovril to make a bouillon. The usual strength—half a teaspoonful to the cup—again approximates to half physiological saline.

Oral rehydration in some types of acute diarrhoea may be made more effective by adding dextrose to the oral fluid. This is related to the effect of dextrose on fluid transport across the mucosa of the small intestine, and is important in cholera and similar conditions affecting the small bowel. It is for this reason that half physiological saline in dextrose (sodium chloride 0.45% and dextrose 2.5%) is often preferred to saline alone.

Rules concerning quantities of fluid needed for oral fluid and electrolyte replacement are difficult to define precisely, but as it is virtually impossible to produce overloading by the oral route, the emphasis should be on a high intake in acute diarrhoea. If oral fluid replacement of three litres a day in an adult in Britain cannot keep pace with fluid loss, and signs of dehydration develop, then admission to hospital for parenteral fluid replacement will be necessary.

In chronic diarrhoea, the problems of supportive treatment become more complex. This is because deficits that can be tolerated for short periods become clinically important if prolonged. These include deficits of potassium, magnesium, and bicarbonate ions in simple diarrhoea, and deficits of specific nutrients when malabsorption is present. The most important of these are iron, folate, vitamin D, and vitamin B₁₂. A regimen that includes systematic replacement of these substances has to be devised when managing chronic diarrhoea, and when malabsorption is the problem replacement usually has to be parenteral.

Specific treatment

Treatment of the cause of diarrhoea can be rational only if the cause is identified. There is seldom justification for giving "specific" treatment if the cause is only conjectural, but there are exceptions. I shall mention these under the broad diagnostic categories that follow.

ACUTE INFECTIVE DIARRHOEA

Although acute infective diarrhoea is not aetiologically homogeneous, it is usually clinically recognisable. And it is at the stage of initial clinical "categorisation"—rather than full diagnosis—that the doctor has to start treatment. What usually puts the patient in this broad category is the presence of one or more of the following features: sudden onset, fever, malaise, vomiting, and the simultaneous occurrence of other cases sharing the same exposure. The decision whether or not to admit the patient to hospital is of prime importance.

Hospital admission should be arranged for any patient whose diarrhoea is of such severity that dehydration will probably not be controlled by oral rehydration. The decision whether or not to admit will often be deferred until 24 hours or longer spent in observing the patient's progress. The relatives should be warned of the signs of deterioration in the patient's condition, instructed carefully in the oral rehydration procedure, and given a telephone number to ring in case of anxiety. Among the danger signs, persistent vomiting, continuing fever, and abdominal pain are the main indications for a request for another visit. None of them should be ignored.

Symptoms

It is safe to give chalk or kaolin mixture in such cases. It is probably best not to give the mixtures containing opium, and if his symptoms are so severe that parenteral morphine is considered advisable the patient should be in hospital. I believe that diphenoxylate (Lomotil) should be reserved for diarrhoea that is a social embarrassment only—such as on holiday or when attending a conference—and that it should not be given when symptoms are severe enough to put the patient to bed.

Supportive treatment

If the patient is not vomiting oral fluid and electrolyte replacement is usually sufficient. In adults half physiological saline is usually adequate; in children, half-strength Darrow's solution is preferred because it contains appreciable amounts of potassium, 18 mmol (mEq) l, and also lactate, 26 mmol (mEq) l, which help to combat metabolic acidosis. If the patient feels like food this should be given. There is no need to starve a patient just because he has diarrhoea, and an adequate intake of calories will help to reduce the period of convalescence. For reasons I shall mention later, milk is best withdrawn from the diet temporarily.

Specific treatment

As aetiological diagnosis is seldom confirmed in the acute stages, "specific" treatment is based on shrewd clinical diagnosis rather than on scientific fact. But the subject is difficult, and it is often better to do nothing than to embark on empirical treatment. The reasons are that if the cause of the diarrhoea is salmonella food poisoning, then specific treatment—even with an antibiotic to which the organism is fully sensitive—will not shorten the duration of the diarrhoea—and, worse, giving an antibiotic helps to perpetuate the carrier state. In classic salmonella food poisoning there is an explosive outbreak of diarrhoea in people exposed to a common risk, and typically the diarrhoea is preceded by fever in at least some of them. Spontaneous recovery—aided by supportive treatment—is the rule.

Some patients infected with salmonella food poisoning organisms are unable to confine the infection to the gut but suffer from a bacteraemia. This produces invasive salmonellosis, a disease similar to typhoid fever, and the systemic nature of the infection makes effective specific antibiotic treatment mandatory. The main signs of invasive disease are prolonged fever (more than 24 hours), a state of "toxic" prostration, the appearance of red macular spots, enlargement of the spleen, and meningism. Patients who develop this syndrome should be admitted to an infectious diseases unit, where they will usually receive an appropriate antibiotic and carefully monitored supportive treatment.

When diarrhoea of sudden onset is bloody and accompanied by fever, the most likely cause is bacillary dysentery. This suggests a *Shigella* infection more aggressive than the *Shigella sonnei* most

commonly originating in Britain. This picture is most often seen in people recently arrived from abroad—or those in contact with such people. *S. flexneri* and *S. dysenteriae* are the main pathogens implicated, and the infections are highly transmissible.

Again, admission of such patients to an infectious diseases unit is advisable. Those with more severe disease will require parenteral fluid replacement, and an appropriate antibiotic chosen on the basis of experience will help to shorten the illness. Shigellae are commonly resistant to sulphonamides, and ampicillin, co-trimoxazole, and nalidixic acid are the agents most likely to be effective.

DIARRHOEA AFTER AN ACUTE EPISODE

After the acute symptoms of an attack of infective diarrhoea have subsided quite commonly diarrhoea of lesser severity persists. Usually this will settle spontaneously in two or three weeks, during which time the patient may be treated symptomatically. Sometimes it does not, and the diarrhoea may then be the result of a temporary disaccharidase deficiency in the mucosa of the small intestine. The commonest deficiency is of lactase, and the diarrhoea will then settle if lactose is removed from the diet. The main source of lactose is milk itself, as lactose has been converted into lactic acid in yoghurt and most cheeses. It is usually best to avoid milk for four weeks, then gradually introduce it in increasing amounts. Many tablets and capsules contain lactose as an excipient, often more than 0.5 g, so that these should be avoided too.

Occasionally ulcerative colitis seems to be started by an attack of acute infective diarrhoea. The passage of mucus and blood indicate that this is likely and that further investigations are needed.

DIARRHOEA WITH BLOOD

Apart from bacillary dysentery, when fever usually precedes or accompanies the onset of diarrhoea, there are several causes of bloody diarrhoea in an afebrile patient. These include amoebic dysentery, carcinoma of the large bowel, ulcerative colitis, and even simple diarrhoea in a patient with piles. It is vital to establish the cause of the symptoms in all patients presenting in this way, and empirical treatment has no place in managing this syndrome. In aged patients faecal impaction with a stercoral ulcer may cause this picture, which can be relieved by enemas or manual evacuation.

AMOEBIC DYSENTERY

The diagnosis of amoebic dysentery has to be made by finding the amoebae, and the possibility should be considered in every patient before diagnosing ulcerative colitis, especially if the patient has lived in the tropics at any time. Rapid clinical response is produced by metronidazole 800 mg, three times daily for five days, but complete eradication of the infection cannot be guaranteed with metronidazole alone, so tetracycline 0.5 g four times daily for two weeks or diloxanide furoate (Furamide) 0.5 g three times daily for two weeks should be given as well. In severe attacks the addition of two or three daily intramuscular injections of 65 mg emetine hydrochloride or 100 mg of dehydroemetine will accelerate clinical recovery.

ULCERATIVE COLITIS AND CARCINOMA

Currently the treatment of carcinoma must be surgical. Fortunately, only a few patients with ulcerative colitis fail to respond to medical measures, and sulphasalazine (Salazopyrin) is the most useful drug for maintenance treatment. A dose of 2g daily will often maintain a patient in remission for years, or even for life. If the inflammatory process in ulcerative colitis is not controlled, then carcinoma commonly supervenes. The advantages of elective colectomy in ulcerative colitis uncontrolled

by drugs are mainly two: the removal of the danger of colonic neoplasia, and the greatly reduced mortality when compared with that of emergency colectomy. But if neoplastic risk is to be eliminated total colectomy must be carried out, and the patient condemned to a permanent ileostomy. Decisions of such gravity must be left to experts, with the patient's informed participation. Other patients with ileostomies can play a vital part in showing that ileostomy is compatible with a full and happy life. Exactly the same approach is used when permanent colostomy after surgery for large bowel carcinoma is planned.

RECURRENT DIARRHOEA

Recurrent diarrhoea with blood is common in carcinoma, ulcerative colitis, and amoebiasis. These I have already mentioned. Recurrent diarrhoea without blood is most commonly caused by the irritable bowel syndrome. Although the aetiology of this common condition—in which diarrhoea and constipation often alternate, and abdominal pain is common—is not known, many patients obtain relief from increasing their dietary intake of bulk-forming agents such as wheat bran. Small doses of a tranquilliser such as diazepam are also often helpful, and many patients will volunteer the information that nervous stress aggravates their symptoms. In these patients firm reassurance on the absence of serious organic disease may be as important as medication.

TRAVELLERS' DIARRHOEA

Traveller's diarrhoea is used to describe the diarrhoea so commonly experienced by travellers abroad. The name includes all the obvious causes of infective diarrhoea such as salmonella and shigella infections, but it is probably most commonly caused by enterotoxin-producing strains of *Escherichia coli*. Occasionally a parasitic infection such as malaria or schistosomiasis can cause it. It is usually self-limiting, but a combination of triple sulphonamide and streptomycin (Streptotriad) given in the recommended doses will often shorten the attack. Travellers who have more persistent diarrhoea on return from abroad may have secondary disaccharidase deficiency, tropical sprue, or giardiasis. Giardiasis is often missed because many laboratories go straight to stool culture without preliminary stool microscopy and so miss the opportunity to see the typical cysts or trophozoites of *Giardia lamblia*. The *Giardia* infection is usually rapidly cleared up by a seven-day course of metronidazole, 400 mg three times daily. Failure is usually caused by reinfection from another member of the household who is asymptomatic. It is quite often necessary to treat all members of a household simultaneously. The infection is now so common, especially in children, that it may be acquired without leaving Britain.

Tropical sprue is fairly rare in Britain, despite the large numbers of travellers returning from the tropics. Like giardiasis it produces a fatty diarrhoea with flatus and weight loss, but it responds little, if at all, to metronidazole. It can be cured with tetracycline (250 mg four times daily) and folic acid (5 mg four times daily), which should be continued for three months. If relapse occurs, treatment should be given for six consecutive months, and appropriate supportive treatment—such as iron replacement—given too.

CHRONIC DIARRHOEAS

The subject of chronic diarrhoea is too large to deal with here. All patients with chronic diarrhoea need accurate diagnosis before treatment is started, and this will usually mean admission to hospital for investigation. The causes range from diabetes to tuberculosis, gluten enteropathy to aperient abuse, and I shall not list them. There is no excuse for treating chronic diarrhoea symptomatically if a proper diagnosis has not been made, as most of the causes, once identified, can be effectively dealt with.