deriving an average respectively of 44% and 32% of calories from fat. Furthermore, although careful steps were taken to validate the dietary questionnaire, the inevitable imprecision of data derived from questionnaires was evident from the information provided.

The best evidence of any causal association would be provided by an intervention study. The United States National Cancer Institute will shortly decide whether to proceed with a large randomised trial to test the hypothesis that restricting dietary fat can reduce the incidence of breast cancer.²⁷ The trial would include 32 000 women aged 45 to 69 with risk factors for breast cancer. A pilot study has shown that a substantial reduction in fat intake (from an average of 39% of calories to 21%) can be achieved and sustained for at least one year. Critics of the proposed trial, which would last a decade and cost around \$100m, argue that the resources might be spent more effectively on observational studies or laboratory research. But the organisers believe that this may be the only way to settle the long standing debate about fat and breast cancer.

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Spending more on turning patients into people

In her 17 articles on rehabilitation published in the *BMJ* in 1985 Daphne Gloag defined "disability" as a restriction or lack of ability in normal activities resulting from an impairment, and "handicap" as the resulting social disadvantage.¹ She also quoted the relative of a severely disabled person who defined rehabilitation as "restoration from patient to person." Ms Gloag's articles followed many other reports on rehabilitation, including a BMA report of 1954² and the Tunbridge³ and Mair⁴ reports of 1972. These reports recognised that consultants, general practitioners, and members of the community services would each have some responsibility for rehabilitation but said that specialist facilities would also be necessary. The Tunbridge report deplored the lack of interest in rehabilitation among doctors and other health workers, and this lack of interest is still all too common in 1987 despite considerable growth in public and professional awareness of the importance of rehabilitation.

In 1985 there were only 23 senior registrar posts in the United Kingdom giving training in rehabilitation with the ultimate potential of accreditation in the specialty, and 18 of these were linked to rheumatology. The report of the Royal College of Physicians of London, *Physical Disability in 1986 and Beyond*,⁵ paid tribute to the many voluntary organisations in Britain that have contributed to caring for disabled people and listed the many agencies and disabled living centres where advice and help can be obtained. But that report, like the many which preceded it, drew attention to the serious

inadequacy of hospital based services and to their uneven distribution throughout Britain. It recommended that each regional health authority should set up a regional disability medicine subcommittee; it also advocated establishing regional disability units staffed by the equivalent of two full time consultants.

As a neurologist I can testify to the uneven distribution of resources in Britain. In the region in which I now work there are, to quote a few examples, the world famous Spinal Injuries Centre at Stoke Mandeville, the equally notable Mary Marlborough Lodge at the Nuffield Orthopaedic Centre, Ritchie Russell House for the care of patients with multiple sclerosis and other chronic neurological disorders, and the admirable Rivermead Rehabilitation Centre; and a consultant in neurological rehabilitation has recently been appointed. But in my former region facilities were much poorer. There was a comprehensive aids centre established by a council for the disabled and other scattered facilities, but attempts by neurologists and neurosurgeons over more than 25 years to persuade the authorities to establish a regional rehabilitation centre had failed.

Neurological disease accounts for many of the most serious physically disabling disorders: stroke, head injury, epilepsy, multiple sclerosis, Parkinson's disease, motor neurone disease, and the other neuromuscular disorders such as muscular dystrophy are important examples. And the pressing needs of patients with rheumatic disorders and with

mental disease or handicap, or both, are well recognised. Recent surveys undertaken by the Association of British Neurologists have shown that the existing burden of clinical work and responsibility shouldered by clinical neurologists in Britain is such as to demand an urgent increase in the consultant establishment. We can but hope that *Achieving a Balance* will start this process. The council of the association recently confirmed that neurologists are willing to play an increasing part in managing neurological disability, but this will be possible only when existing clinical pressures are relieved.

The advice which doctors and health authorities have received from innumerable authoritative sources over more than 30 years is unequivocal and clear. We have heard about the Cinderella specialties, and rehabilitation is plainly one. Resources are finite and rapid expansion may be impracticable, but a rapid ascent for this specialty in the priority stakes

is clearly justified—and neurologists are prepared to participate fully. And surely all health authorities should urgently re-examine the rehabilitation facilities they now provide and correct the most glaring deficiencies.

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Smallpox ten years gone: what next?

Ten years ago this week in Merka, Somalia, the last naturally occurring case of smallpox in the world was reported. This was the first and only time that a positive attempt to eradicate an infection had succeeded. What are the prospects for eradicating other diseases?

Eradication is "the extinction of the pathogen that causes the infectious disease in question."¹ In elimination the disease disappears but the causative agent remains. The characteristics of an infection that may make it eradicable are its limitation to humans, an easily recognisable illness with no subclinical or latent infection, no long term carriers, lifelong immunity with visible evidence of immunity, low to moderate infectivity, a medium to long incubation period,² and, of course, the availability of an effective tool for interrupting transmission. Smallpox had all these characteristics.

The six target diseases of the World Health Organisation's expanded programme on immunisation are measles, pertussis, neonatal tetanus, polio, tuberculosis, and diphtheria.³ Many of the factors necessary for elimination are present for each of these diseases—but some are not. Measles immunity is not easily recognisable, and the infection is so highly communicable that a vaccine efficacy rate of about 95% is probably not high enough even to eliminate, much less eradicate, the disease.⁴ An outbreak of measles recently occurred in a secondary school in the United States, although more than 99% of the students were vaccinated and 95% had serological immunity.⁵ Pertussis is also highly infectious, immunity is not recognisable, and the vaccine is almost certainly not effective enough and in any case probably does not prevent carriage of the organism. As *Clostridium tetani* is ubiquitous tetanus is not eradicable. Neonatal tetanus could theoretically be eliminated in the Third World if 100% of pregnant women were vaccinated, but in practice combining immunisation and health education should prove more effective.

Most infection with poliovirus is subclinical, and immunity is clinically unrecognisable. But countries that are efficient at giving vaccines have proved remarkably successful not only in practically eliminating the disease but also in virtually eradicating the organism; the Pan American Health Organ-

isation aims at eradicating polio from the Americas by 1990.⁶ Nevertheless, the widespread use of the live vaccine has led to the circulating wild virus being replaced by the vaccine virus,⁷ which has some neurological side effects of its own. Tuberculosis is clearly not eradicable at present, and, although little of the decreasing incidence and severity of the disease of the last century can be attributed to medical planning, much can still be done to further reduce its incidence.

Diphtheria has many features that suggest that it cannot easily be eradicated, especially as in theory the vaccine should not affect the carrier state. Nevertheless, with a national immunisation rate in Britain of 84% not only are cases of diphtheria rare but so also are isolations of toxigenic strains. Such cases and strains are occasionally reported, however, and serological studies and localised outbreaks in countries with high immunisation rates^{8,9} suggest that we cannot be complacent.

Prospects for eradicating congenital rubella syndrome are more encouraging. Cases reported each year in the United States have declined steadily: only two cases were reported in 1984 and 1985.¹⁰ Although the syndrome is notoriously undernotified and underdiagnosed, reduction has been achieved by universal immunisation augmented by selective immunisation of adult women of childbearing age; recently announced changes in British policy are intended to eliminate rubella and the congenital rubella syndrome although prospects for eradicating the virus are remote.

The case for eliminating mumps on grounds of cost benefit is not strong,¹¹ but it strengthens when mumps vaccine is given with measles and rubella. The prospects for elimination or eradication are probably similar to those for rubella; a vaccine coverage rate of 85% at the age of 2 years is said to be adequate.¹² With all these diseases there are epidemiological side effects of mass immunisation,⁴ which are mainly those of altering the age distribution of the disease.^{5,13}

Clearly we cannot be wildly optimistic about eradicating many infections with vaccines in the near future, but strategies other than immunisation are available. The universal provision of safe drinking water will eradicate diseases transmitted solely by this route—for example,