promotion driven by financial inducements and concerned about the emergence of a two tier system of care.

Public health medicine is unsure of its role in the new world of purchasers and providers.[5,6] As a profession it argues for more specialists[7] despite the likelihood of further mergers between health authorities but is anxious about seeking links with other groups such as environmental health.[8] Above all, the two branches of the profession have pursued different career pathways, with general practitioners having had little training in the skills of population medicine and public health doctors hardly noticing that another group is now formally responsible for promoting health and preventing disease. A recent report by the Faculty of Public Medicine on health in Britain seems to ignore general practice altogether.[9] With the two branches of the profession talking past each other, managers have increasingly set the agenda for the NHS.

The challenge for general practitioners and public health doctors is to define their core values and identify where these values conflict with prevailing market or political forces. This recognition lay behind the independence of medical officers of health and the independent contractor status of general practitioners. This allowed the two branches of the profession to act as advocates for the health of the public and individual patients. The health service reforms provide an opportunity for primary care and public health to reassert the values of a common profession. The barriers between the specialties need to be broken down by joint appointments so that epidemiology and health promotion are given credibility by clinical contact. The divergent career pathways of general practice and public health medicine need to have more links. This is beginning to happen with postgraduate masters courses for general practitioners and the appointment of specialists in public health medicine to family health services authorities.

General practitioners and public health doctors are both responsible for preventing disease and promoting health. Both are involved in purchasing, and both belong to an independent profession, which means accountability to their patients and the public rather than the political expediency of market places. Primary medical care needs to develop within the broader context of primary health care, which requires a reconciliation between the medical care of individual patients and the health of populations. The new emphasis on health promotion provides general practitioners and public health doctors with an opportunity to rediscover their common roots and core values.

DAVID R HANNAY
Professor

Department of General Practice,
Medical School,
Sheffield S10 2RX

1 *Ministry of Health Act 1919*. London: HMSO, 1919.
2 Morrell DC. Role of research in development of organisation and structure of general practice. *BMJ* 1991;**302**:1313-6.
3 Griffiths R. *Report of NHS management inquiry*. London: DHSS, 1983.
4 Committee of Inquiry into the Future Development of the Public Health Function. *Public health in England*. London: HMSO, 1988.
5 Whitby P, Jones I. Public health heresy: a challenge to the purchasing orthodoxy. *BMJ* 1992;**304**:1039-41.
6 Bhopal RS. Public health medicine and purchasing health care. *BMJ* 1993;**306**:381-2.
7 Todd J. The public health function. *Public Health Physician* 1992;**3**(2):4.
8 Griffiths R. The need for boundaries. *Public Health Physician* 1992;**3**(4):1.
9 Faculty of Public Health Medicine. *UK levels of health*. London: FPHM, 1992.

Creutzfeldt-Jakob disease after pituitary gonadotrophins

The prion is the problem

National human pituitary programmes supplying human growth hormone and human pituitary gonadotrophins were established in the 1960s after evidence that pituitary dwarfism could be treated with human growth hormone and anovulatory infertility with human pituitary gonadotrophin. The human pituitary programmes of most countries were ended abruptly in 1985 after reports of Creutzfeldt-Jakob disease in patients who had been treated with pituitary human growth hormone.[1] To date around the world 28 cases of the disease have been reported in patients who received injections of human growth hormone derived from pituitary glands collected at necropsy.[2]

Creutzfeldt-Jakob disease was first described in 1920 as a rare cause of rapidly progressive dementia. The associated clinical features include ataxia, myoclonic movements of the limbs, and blindness. It is a sporadic disease with an incidence of one case per million population. Case reports have documented the disease not only after treatment with human growth hormone but also after neurosurgical procedures and corneal transplantation.[3] Creutzfeldt-Jakob disease typically develops in people aged 50 to 75, though it has occurred in teenagers after treatment with human growth hormone in childhood. It is undetectable in asymptomatic patients, in whom, apparently, it may incubate for up to 20 years. If symptoms develop there is no treatment, and the disease is uniformly fatal. Creutzfeldt-Jakob disease is related to other human spongiform encephalopathies such as kuru and the Gerstmann-Straussler syndrome.

The nature of the transmissible agent that causes the spongiform encephalopathies is still not fully elucidated; it is generally considered not to be a virus, and the name prion has been suggested.[4,5] Prion protein is a membrane glycoprotein present in most organs including neurones and accumulation of this abnormal protein is central to the causation of the spongiform encephalopathies.

Recently, Collinge and colleagues screened the prion protein gene of seven patients who had developed Creutzfeldt-Jakob disease after treatment with growth hormone and found that four had an uncommon valine/valine 129 homozygous genotype, whereas in a control group of 106 healthy people they found only 13 with this genotype. This suggests that the presence of the 129 valine homozygosity may confer susceptibility to infection with exogenous prion.[6] The study awaits confirmation but suggests a possible screening procedure for susceptibility to Creutzfeldt-Jakob disease among patients previously treated with hormones derived from human pituitary glands.

Against this background four women in or from Australia have developed Creutzfeldt-Jakob disease after treatment with human pituitary gonadotrophins—the first cases of Creutzfeldt-Jakob disease after gonadotrophin treatment. The first was a woman aged 40 living in Adelaide who had been treated in 1974 and 1975.[7] The diagnosis in the second case was serendipitous. The neurology registrar concerned with the first patient travelled to Britain for further postgraduate experience. On his arrival his consultant remarked that an Australian patient with Creutzfeldt-Jakob disease had recently been admitted and asked if he would care to see her. A history emerged of treatment with human pituitary

gonadotrophin in Melbourne between 1976 and 1978. Creutzfeldt-Jakob disease was the cause of death in a woman aged 39 also living in Adelaide who had received human pituitary gonadotrophin in 1979. She had been treated with the same batch of human pituitary gonadotrophin as the index case. Twenty eight other Australian women are known to have been treated with that batch. A fourth woman died from Creutzfeldt-Jakob disease in Western Australia in 1991 after receiving human pituitary gonadotrophin.

The human pituitary hormone programme started in Australia in 1964. By 1985 the programme had supplied human growth hormone for 664 children with short stature and pituitary gonadotrophin for 1447 adults with infertility.[8] From its inception the Australian programme used a column chromatographic purification procedure to extract the hormones. Up to 800 cadaver pituitary glands were pooled to provide a single batch. Australia was one of the few countries in which gonadotrophins derived from pituitary glands were used to treat infertility. Most countries preferred to use gonadotrophins derived from urine from postmenopausal women. More recently both gonadotrophins and growth hormone have been derived with recombinant technologies. In Britain a few women were treated with pituitary gonadotrophin at the Birmingham and Midland Hospital for Women in the 1960s, but urinary gonadotrophins were substituted in the early 1970s. Any women who acquired Creutzfeldt-Jakob disease from this source are likely already to have died.[9]

The chief medical adviser to the Australian Commonwealth Department of Health recommended in 1990 that patients who had received pituitary hormones should be advised by their medical practitioners never to donate blood, corneas, or other tissues. Although it was believed that vertical transmission from a pregnant woman to her baby could not occur, Japanese workers have already found infectious material in placental and umbilical cord blood.[10] The Australian government has funded a special counselling service in addition to that provided by individual consultants and clinics for patients who received pituitary hormones.

Further research is needed into the natural mechanism of spread of the agent causing Creutzfeldt-Jakob disease. The Australian Attorney General's Department is examining the issue of compensation for the families concerned in these tragedies. A prospective case registry is being established to enable continued epidemiological surveillance of all Australian patients who received pituitary hormones. This is no easy task, but it is hoped that these mechanisms will provide patients and their families with accurate information on this public health issue.

DAVID L HEALY
Professor

Monash University Department of Obstetrics and Gynaecology,
Monash Medical Centre,
Clayton 3168,
Victoria, Australia

JAMES EVANS
Senior lecturer

Department of Obstetrics and Gynaecology,
University of Melbourne,
Royal Women's Hospital,
Carlton 3053,
Victoria, Australia

1 Lazarus L. Suspension of the Australian human pituitary hormone programme. *Med J Aust* 1985;143:57-9.
2 Hintz R. Untoward events in patients treated with growth hormone in the USA. *Horm Res* 1992;38:44-9.
3 Rappaport EB. Iatrogenic Creutzfeldt-Jakob disease. *Neurology* 1987;37:1520-2.
4 Weissmann C. A unified theory of prion propagation. *Nature* 1991;352:679-83.
5 Prusiner SB. The molecular biology of prion diseases. *Science* 1991;252:1515-22.
6 Collinge J, Palmer MS, Dryden AJ. Genetic predisposition to iatrogenic Creutzfeldt-Jakob disease. *Lancet* 1991;337:1441-2.
7 Cochius JI, Burns RJ, Blumbergs PC, Mack CK, Alderman CP. Creutzfeldt-Jakob disease in a recipient of human pituitary derived gonadotrophin. *Aust NZ J Med* 1990;20:592-4.
8 Lazarus L. Creutzfeldt-Jakob disease and human pituitary-derived hormone therapy. *Royal Australian College of Physicians: Fellowship Affairs*. November 1991:21-8.
9 Pfeffer N. Early infertility treatments derived from human pituitary. *BMJ* 1993;306:1128-9.
10 Tamai Y, Kojima H, Kitajima R, Taguchi F, Ohtani Y, Kawaguchi T, *et al.* Demonstration of the transmissible agent in tissue from a pregnant woman with Creutzfeldt-Jakob disease. *N Engl J Med* 1992;327:649.

The role of doctors in promoting smoking cessation

Doctors can't do much on their own; public policy can

In 1979 Russell and his colleagues published what would become one of the most cited and inspirational papers in the history of research into stopping smoking.[1] They found that doctors who gave their patients brief advice and "warned" that they would follow them up could expect a 5·1% increase in the number who stopped smoking for at least 12 months beyond that in controls who received no advice. Their most resonant observation was the extrapolation that if all British general practitioners were routinely to follow this simple advisory regimen an annual yield of some 500 000 ex-smokers could result.

Their work has since inspired dozens of replications in different primary care settings (general practices, dental practices, outpatient clinics, hospitals, and antenatal groups and with patients who have had coronary events or other smoking related diseases). The most rigorously evaluated of these are the subject of a new review monograph by Sanders from a project funded by the Health Education Authority.[2]

The monograph joins several other recently published reviews that have reached broadly similar conclusions.[3-8] These are, firstly, that interventions with motivated volunteers not surprisingly produce better cessation rates than those tried in randomly selected patients. Secondly, if doctors say something about cessation, however brief, to their smoking patients a small, but often significant, number of these will go on to quit compared with those with whom the subject has been avoided.

Thirdly, if something more extensive is done, such as pursuing the issue in line with a protocol over several consultations, setting a date for stopping and following this up with an appointment, or trying to personalise the message to a patient's particular condition or circumstances, better results are generally achieved. This may, however, simply be a consequence of more motivated smokers being willing to attend more time consuming interventions.

Lastly, cessation rates tend to be higher when a nicotine replacement product is prescribed than when the intervention is only advice or counselling. Nevertheless, the generally non-significant differences that are found between active and placebo gum tend to suggest that it may be the accoutrements of both counselling about the gum and the way gum constantly reminds smokers that they are trying to quit that produce the effect.

If the original extrapolation by Russell's group ("if all general practitioners were to . . . ") inspired many subsequent clinical trials; unfortunately it did not have the same effect on