Saturday 12 July 1997
BMJ

Managing established coronary heart disease

General practice is ideally placed to provide coordinated preventive care

The Department of Health's controversial banding system for promoting health in primary care was discontinued at the end of September 1996. Under the new arrangements for health promotion each practice has the opportunity to plan and develop its own effective health promotion strategy, based on the *Health of the Nation* and the needs of the practice's population.

In any new strategy for promoting health, priority should go to implementing preventive measures in patients with established coronary heart disease, such as a history of myocardial infarction or stable angina or having undergone revascularisation by angioplasty or coronary artery bypass grafting. This view has been echoed by two recent reports on preventing coronary heart disease in primary care.[1 2] The reasons are threefold.

Firstly, patients with established coronary heart disease are at increased risk of subsequent vascular events (death, myocardial infarction, and stroke). In the British regional heart study 14% of 242 men with electrocardiographic signs of definite myocardial infarction had reinfarctions over the 4.2 year follow up, compared with only 2% of those with normal electrocardiograms.[3]

Secondly, these high risk patients amount to some two to three million people in Britain, and it has been estimated that about half of all deaths from coronary heart disease occur in this population.[4] Therefore, preventive measures which reduced mortality would have a considerable impact on the total number of deaths from coronary heart disease.

Thirdly, there is good evidence that a substantial proportion of these high risk patients remain unrecognised in practice and that those who are being treated are receiving suboptimal care, especially women.[5 6]

The risk these patients face can be substantially reduced by effective management focusing on appropriate changes in lifestyle and pharmacotherapy. Changes in lifestyle include stopping smoking, rehabilitation with exercise, and dietary modification. Observational studies have shown that mortality in patients who stop smoking after myocardial infarction is 50% lower over a two year follow up compared with those who continue to smoke.[7]

Evaluating cardiac rehabilitation programmes is difficult because of the various combinations of exercise training, modifications of lifestyle, and multiple endpoints used in individual trials. However, an overview of 22 randomised trials of cardiac rehabilitation programmes with exercise involving 4554 patients has confirmed that, after an average of three years' follow up, the risk of cardiovascular mortality was reduced by 22%, fatal reinfarction by 25%, and total mortality by 20%.[8] The diet and reinfarction study, involving about 2000 men with a history of myocardial infarction, showed that those who substituted a portion of oily fish into two or three meals each week had a 29% reduction all cause mortality over two years even though their plasma cholesterol concentrations were unchanged.[9] These interventions have been less studied in patients with stable angina and those who have undergone revascularisation, but it seems appropriate to extend the findings to these groups.

Pharmacological interventions that have been tested in patients with a history of myocardial infarction include antiplatelet therapy, β blockade, angiotensin converting enzyme inhibitors, and lipid lowering drugs. Eleven randomised trials have tested the effectiveness of antiplatelet therapy in about 20 000 patients with a history of myocardial infarction. The trials concluded that antiplatelet therapy prevents about 40 vascular events per 1000 patients treated in the first two years after a myocardial infarction irrespective of age, sex, blood pressure, and diabetes.[10] Furthermore, other trials have shown that the benefit of antiplatelet therapy can be extended to patients with angina and those who have undergone revascularisation procedures.[10 11]

The pooled evidence from 23 randomised trials of long term treatment with β blockers in over 19 000 patients after myocardial infarction suggests that mortality is reduced by about 20%. Additional long term benefits include reducing the risk of reinfarction by 25% and reducing the risk of sudden death by 30%.[12]

In patients with left ventricular dysfunction after myocardial infarction, angiotensin converting enzyme inhibitors reduced the risk of all cause mortality by 19%, the risk of non-fatal and fatal vascular events by 21%, and the development of severe heart failure by 37% over 42 months of follow up.[13] In patients with clinical evidence of heart failure after myocardial infarction, treatment with an angiotensin converting enzyme inhibitor over 15 months resulted in a significant 27% reduction in risk of death and a 19% reduction in vascular events.[14]

The Scandinavian simvastatin survival study of patients with angina or a history of myocardial infarction clearly showed, in patients with a total cholesterol concentration of 5.5-8.0 mmol/l, a 30% reduction in total mortality and a 42% reduction in coronary

mortality over a five year follow up.[15] These reductions in mortality were achieved without an increase in non-cardiovascular deaths. Furthermore, the recently published cholesterol and recurrent events trial (CARE) demonstrated that the benefit of cholesterol lowering with pravastatin after myocardial infarctions in patients in whom the total cholesterol was less than 6.2 mmol/l.[16]

General practice faces a formidable task in implementing the tested interventions in everyday clinical practice. A practice of 10 000 patients will have between 300 and 500 patients with established coronary heart disease, of whom 150 will be aged over 70-75.[17] Organising care for this number of patients requires effective teamwork—to identify patients with established coronary heart disease; develop agreed practical, evidence based guidelines; and identify possible barriers to their implementation. The guidelines should include details on assessing risk factors for coronary heart disease, giving appropriate advice about lifestyle and instituting treatment, follow up, criteria for referral, and audit. Improving communication and coordination between primary and secondary care may help to ensure that the results of the clinical trials are implemented in practice.

General practice is uniquely placed for delivering effective care for patients with established coronary heart disease, which could result in many more patients receiving better quality care and enjoying better health.

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Pigeon fancier's lung

Antigen avoidance and respiratory protection are the mainstays of management

Pigeon racing is based on the remarkable homing instinct of pigeons, which enables them to return to their loft over distances of many hundreds of miles. British pigeon fanciers are particularly proud of their role in the second world war, when highly trained pigeons were used for communication.[1] Pigeons were parachuted in small containers into occupied Europe with instructions for the finder to attach espionage messages to the birds, which were then released to fly silently and undetected back to lofts in Britain.

There are now about 83 000 registered pigeon fanciers in Britain. When racing, the birds are transported to a liberation point; a ring is placed on one leg; and, when released, the bird returns to its loft, where the ring is removed and placed in a special clock which registers the exact "timing in" of the bird. The location of each loft has been registered so that the distance travelled by each pigeon can be calculated. Racing pigeons have been bred and trained for speed and endurance. The official British duration record is 1173 miles in 15 days, and the highest race speed is 110.07 miles per hour.[2] Although a typical pigeon fancier keeps pigeons as a hobby, pigeon fancying is a multimillion pound business, and top class birds have been sold for as much as £110 800.[2]

Pigeon fancier's lung is a form of extrinsic allergic alveolitis in which the repeated inhalation of avian antigens provokes a hypersensitivity reaction in susceptible subjects.[3-5] The acute form manifests as recurrent episodes of breathlessness and cough, with fever, shivering, and malaise, occurring four to eight hours after exposure to antigen. Lung function tests and chest radiographs may be abnormal after exposure but usually return to normal between episodes. The chronic form is characterised by the insidious development of breathlessness and pulmonary fibrosis.[4]

Classification into acute and chronic forms has caused confusion by implying an inevitable progression

from acute to chronic disease if the fancier continues to keep pigeons. However, the interaction of antigen exposure and host response in the initiation and progression of the disease is considerably more complex than this, and an alternate classification system has been proposed that recognises three main patterns of disease,: "acute progressive," "acute intermittent non-progressive," and "recurrent non-acute" disease.[6]

Some patients present for the first time with established lung fibrosis without having experienced acute episodes,[7] whereas others continue to have intermittent acute episodes for many years without progressing to permanent lung damage.[4 5] Fanciers who develop the disease have often remained in a state of equilibrium with the antigen for many years before the onset of symptoms, and in some patients established disease may regress despite continued exposure to antigen.[3 5]

The clinical course of the disease is unpredictable. Progressive deterioration in lung function occurs in some fanciers with continued exposure to antigen, and, rarely, the disease may progress even after contact with pigeons has ceased.[8 9] The variable clinical course of the disease is reflected in current concepts of its pathogenesis, which emphasise factors that modulate the basic interaction of antigen and immune response, either enhancing or suppressing the inflammatory process.[10] When treating patients with the disease, doctors should realise that it is not a uniform disease but rather a complex dynamic clinical syndrome.

Ideally, treatment of extrinsic allergic alveolitis consists mainly of avoiding contact with the inciting antigen, and complete cessation of exposure to pigeons is the safest advice for patients with pigeon fancier's lung. However, this may not be necessary in all cases, and fanciers are usually highly committed to their sport.[5] Under these circumstances it is reasonable to recommend a combination of respiratory protection and antigen avoidance. Respiratory protection masks have been shown to improve symptoms, to prevent a reaction to antigen challenge, and to reduce the level of circulating antibodies.[11 12] The protection provided by masks is not complete, however, since most masks permit penetration of particles less than 1 μm in diameter, and leakage through defects in the fit of the mask to the face allows particles to bypass the filter. In general simple masks complying with European Standard EN149 FFP2S provide a reasonable degree of protection, but it is essential that fanciers who use masks have adequate medical follow up to ensure that there is no progression of the disease.

Sensitised fanciers should wear a loft coat and hat that are removed on leaving the pigeon loft, to avoid continuing contact with pigeon derived antigens carried on clothing or hair. Time spent in the loft should be kept to a minimum, and whenever possible the fancier should avoid activities associated with high levels of antigen exposure such as "scraping out" or cleaning the loft. Fanciers should be advised not to transport pigeons on the back seat of a car since this can result in very high levels of airborne antigen in an enclosed space. Antigen avoidance and respiratory protection should be continued at pigeon shows. When highly sensitised patients have given up pigeons completely, they will still face a risk of residual antigen exposure in their home and, more likely, continued exposure through their social circle if they remain in close contact with other pigeon fanciers. Some fanciers find it helpful to increase the level of ventilation in their loft, but Edwards et al showed that this did not reduce particle and antigen counts in the loft, possibly because air turbulence generates as many airborne particles as are eliminated to the outside by ventilation.[13]

Although there is often an apparent beneficial response to corticosteroids, it is difficult to distinguish between the effects of treatment, the natural course of the disease, and the effect of antigen avoidance. There have been no controlled trials of corticosteroids in patients with pigeon fancier's lung, but studies of patients with farmer's lung provide insight into their effects on extrinsic allergic alveolitis. A randomised double blind placebo controlled study of corticosteroids in 36 patients with acute farmer's lung found that the patients given prednisolone showed more rapid improvement in lung function with a significantly higher diffusing capacity at one month compared with the control group.[14] However, there was no difference in long term outcome between the two groups.

Treating patients with pigeon fancier's lung requires an appreciation of both the fascination of the sport to fanciers and the complexity of the disease. Antigen avoidance and respiratory protection are the main aspects of treatment, and corticosteroids have only a small role in the long term. It may not be necessary for the fancier to give up his pigeons, but ongoing supervision of symptoms, lung function, and chest radiographs is advisable. Sequential monitoring of the level of circulating antibody to pigeon derived antigen is a useful guide to the effectiveness of avoidance measures.[12]

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"Non-lethal" weapons: precipitating a new arms race

Medicine must guard against its knowledge being used for weapon development

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Armies are purported to have already deployed dazzling devices, calmatives, entangling agents, adhesives ("stickums"), material that makes any surface too slippery to walk on ("slickums"), devices generating infrasound or electromagnetic waves, and devices for riot control.[1 2] Other possible devices are sprays to weaken vehicle or plane parts, electromagnetic beams to confuse computers, and bacteria to degrade fuel. The term applied to this new generation of military technology is "non-lethal" weapons; it implies that military operations can avoid death and serious injury. Should not the medical profession rejoice?

Let us first examine the terminology. A "weapon" is something that is designed to cause bodily harm; technologies designed specifically to damage inanimate objects should not be considered in the same context.[1] "Non-lethal" implies zero fatalities, but such an objective is acknowledged to be unrealistic, giving rise to alternative phrases such as "less than lethal" or "sub-lethal."[1] These terms carry the further implication that conventional antipersonnel weapons are "lethal." However, rifles and fragmentation weapons kill (only) 20-25% of the casualties.[3-5] A buried antipersonnel mine containing 30 grams of explosive is designed to blow off or disrupt the foot; few victims die from this injury if treatment is available. Does this make it a "non-lethal" weapon? Eye attack laser weapons and other "optical munitions" have been produced in line with the "non-lethal" concept, supported by the argument that it is better to blind enemy soldiers than to kill them. The euphemisms and political correctness that surround the moral, legal, media, and tactical aspects of warfare of the future are complex and bizarre.

Before making military surgeons redundant, we must also examine the intended effects of "non-lethal" weapons on humans. Such an examination is not reassuring.[2 6] The purpose is to "disable." This sounds better than inflicting disability and does not immediately beg the difficult question of how long the person will be disabled for. Will blinding be permanent? Will the various energy forms that target the function of the central nervous system leave the victim with permanent neurophysiological effect? Can entangling agents asphyxiate? Will a "calmative" agent only calm? If it is established what energy output or concentration is non-lethal or temporary, you have also discovered what is lethal or permanent. Likewise, since the only difference between a poison and a drug is the dose, do military planners really believe that they can control the "dose" on a battlefield? In brief, will these new weapons have a switch giving the operator a choice between non-lethal and lethal? Rather than sutured wounds, skin grafts, or amputations, will the soldiers who have survived battlefields of the future return home with psychoses, epilepsy, and blindness inflicted by weapons designed to do exactly that? Should not these questions be considered before such weapons are deployed?

The precise effects of each of these new weapons are unknown, in particular to civilian doctors. How will the "wounded" of future wars be treated? In addition, "non-lethal" weapons will always be backed up by or used in conjunction with conventional weapons.[1] This may mean that the lethality of conventional weapons is potentiated and that doctors may have to treat people suffering from the effects of both conventional and new weapons.

There is also a fundamental ethical dilemma for doctors. The development of this new generation of weapons incorporates knowledge from the remarkable advances made in medical science; two examples are calmatives and eye attack lasers.[2 7 8] The ultimate expression of this dilemma is the potential development of race specific weapons based on knowledge of genetic engineering and human genome diversity. This can no longer be regarded as science fiction.[9 10] The medical profession must guard against use of its knowledge for the purposes of weapon development. Also, will the development of this kind of weapon by the "haves" be perceived in only tactical terms by the "have nots" so precipitating a new form of arms race? If so, the focus of research and development will not be confined to "non-lethal" aspects of this technology.[1 2]

Governments have given serious consideration to at least one such "non-lethal" weapon system. Blinding laser weapons were prohibited at a United Nations conference in 1995. The abhorrent notion of the effects of this kind of weapon—intentional blinding—contributed to this decision.[8 11 12] However, there is no specific international treaty that covers other new weapons. Is it not the responsibility of doctors to recommend some kind of proactive control based on a comparison between the known effects of conventional weapons and the purported effects of new weapons?[5] The public may be seduced by the term "non-lethal." There are reasons why the medical profession should not be.

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End of life decisions in mentally disabled people

Protecting vulnerable life does not mean prolonging it regardless of suffering

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The acid test for any society that claims to be civilised is whether it really protects the life and promotes the wellbeing of its most vulnerable citizens, including the very young, the very old, the chronically ill, and certainly the mentally impaired. Most seriously mentally disabled people have only a limited ability, or are entirely unable, to judge their own situation and make adequate decisions about it and are thus partly or entirely incompetent. All major decisions have to be made for them or, at least, have to be supported by carers and relatives. This sometimes includes difficult medical decisions at the end of life. Protecting vulnerable life does not mean prolonging it regardless of the amount of suffering this would entail.[1] In this week's *BMJ* (p 88), van Thiel et al chart, for the first time, end of life decisions in people with mental disability.[2]

That this study was performed in the Netherlands should be no surprise. Previous studies have shown that Dutch physicians support such research, which has resulted in detailed and reliable information about end of life decision making in general practice and in clinical medicine[3 4] but also in sensitive domains such as nursing home care, psychiatry,[5] neonatology,[6] and the care of patients with AIDS.[7] But perhaps the care of people with mental disability is the most sensitive in this respect, and until now it has been the subject of little professional or public debate.

Too sensitive an issue

This is illustrated by the Royal Dutch Medical Association, which last year published its position paper on euthanasia on explicit request,[8] followed two weeks ago by a position paper on end of life decisions in incompetent patients.[9] The first paper supported the practice of euthanasia in competent patients under several strict conditions. The second paper was more directed at decisions to withhold or withdraw life prolonging treatment in four groups of patients: neonates, psychogeriatric patients, psychiatric patients, and comatose patients. Mentally disabled patients were left out of this report, the issue being too sensitive.

Care for this group differs in several respects from care for those other groups of incompetent patients. The incompetence, whether complete or partial, is lifelong and is in that respect part of the person's identity. This gives a more optimistic perspective to care than in other forms of incompetence, such as dementia or the gradual loss of consciousness in the final stages of a terminal disease, where the incompetence represents a loss of previous competence and identity. Those caring for people with mental disability must learn to understand even very slight cognitive or emotional expressions from the patients, often through long and close interaction. End of life decision making is therefore more multidisciplinary and requires time and effort to clarify the patient's wishes and to obtain complete consensus of all concerned.

Active ending of life is exceptional

In keeping with these differences, van Thiel et al found that active ending of life of patients with mental handicap was highly exceptional in the Netherlands, occurring perhaps once or twice a year.[2] In about a third of all deaths of people with mental handicap in 1995 there had been a decision to withhold or withdraw life prolonging treatment, while in about 10% of cases opioids had been given in doses that might have shortened life. In the general population, by comparison, these figures are 20% and 19% percent respectively.[2] The estimated amount of time by which life had been shortened was on average lower than in end of life decisions in the general population, suggesting that end of life decisions in people with mental disability are made in a late stage of the terminal illness.

Studies such as these show new facts, not new practices. Empirical research is a prerequisite for serious ethical debate and for learning from each other in optimising the quality of care for dying people. To decide whether physicians are, as some people fear, sliding down a slippery slope towards widespread euthanasia, time series of empirical data are needed; and if we are to identify relevant differences between countries in the care for the dying and the quality of decision making about the end of life, we need comparative studies. The rare examples of such studies[2 10] have already shown some surprising results.

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Who wants a career in academic medicine?

Integrated clinical, research, and teaching programmes could stop the decline

"Clinical medicine and dentistry are very popular and rewarding professions; biomedical research is one of the most exciting, challenging and productive areas of research today. One might expect the combination of the two, namely clinical academic medicine and dentistry, would be among the most desirable of all professions, but all is not well." So begins Sir Rex Richards's recently published report on clinical academic careers.[1]

Why was there a need for such a report? The answer can be found in the disturbing statistics of poor recruitment and retention of Britain's medical academic staff, with 56 vacant chairs and 192 other vacant academic posts in 1995-6, and a steady exodus of senior lecturers out of academic medicine into NHS posts. It can also be found wherever medical academics gather to discuss their careers, as at the recent conference of the BMA's Medical Academic Staff Committee (MASC). Instead of optimistic opinion leaders looking to advance the cutting edge of medical science and technology, an external observer would find a demoralised and apprehensive workforce struggling under the combined pressures of high clinical workload for the NHS and heavy research and teaching commitments for their universities. Together with reduced financial expectations, greater job instability, and less advantageous terms and conditions than for other academic careers, these pressures have eroded those most precious of commodities—academic freedom and independence. As a result, today's academics are finding it increasingly difficult to deliver the strong research and teaching programmes that are essential for the future of British medicine. If the teachers and role models are demoralised, what sort of message does this give to medical students, and how can we deliver the curriculum set out by the General Medical Council in *Tomorrow's Doctors*?[2]

Because of changes in the NHS over the past decade, all doctors, including medical academics, are under greater pressure from managers and clinical directors. At the same time, universities expect the same doctors to deliver ever higher research ratings while honouring ever increasing teaching commitments. Medical student numbers have increased without a corresponding rise in the number of medical academic posts. This year's research assessment exercise has shown a significant improvement in the ratings of clinical medical departments, but they have still scored generally lower than their non-clinical counterparts. This can be directly attributed to the increased pressure and decreased time that clinical academics have for research. As a result, universities are now looking to cut some medical posts, which will further undermine the status of academic medicine.

Clearly this spiral of pressure and decline must be stopped. Sir Rex Richards's 35 recommendations point the way. The more important recommendations deal with the urgent need for universities and NHS trusts to act together to create an environment that fosters the research and teaching potential of their clinical academics, and to ensure that, at least, they are treated no worse than their NHS colleagues. Some trusts and departments have displayed somewhat anti-academic attitudes, which is counterproductive to the development of cutting edge medicine. But it is clear that we need to do more than just correct inequalities. Somehow we have to encourage academic medicine as a positive career choice. Sir Rex Richards concludes, "The evidence to us was overwhelming that the pressures of service and the pursuit of clinical research at internationally competitive levels remain very difficult indeed to reconcile. Forms of governance which give greater weight to the academic mission of university hospitals and service funding which enjoys some degree of protection are needed if this country is to remain a leading centre of medical research."

In Germany and the United States academic medicine has the highest career profile and prestige, mainly because of the existence of university run hospitals that provide teaching and research excellence. In these institutions there is none of the ambivalence and confusion that characterises academic departments in Britain. There is no conflict between the universities and the healthcare system; academic doctors run both the clinical service and the research and teaching programmes. This model works well and could be introduced with little disruption in many of Britain's inner city hospitals that are linked with universities, as suggested in the Richards report. To strive for a leading position in a university hospital offering an integrated clinical service with a well structured teaching and research programme would be the most powerful career incentive for a young, high achieving, academically inclined doctor, and would solve the problems of recruitment and career instability that Britain is currently experiencing.

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