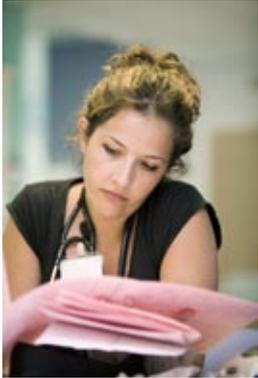


## The future of female doctors

Women will have to adapt as they become the majority, and so will the NHS



### RESEARCH, p 1429

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Women will form the majority of doctors in the NHS within 10 years. The suggestion by Professor Carol Black that the future of British medicine might be endangered by this feminisation of the medical workforce generated both media hyperbole and serious debate.<sup>1 2</sup> By raising these issues directly, Professor Black crystallised a range of professional concerns and made it legitimate to discuss fears and perspectives that might otherwise have been dismissed as politically incorrect, or worse.

*Women and medicine: the future*, the reports published this week by the Royal College of Physicians, tackle these issues head on. The summary report<sup>3</sup> is based on a major and meticulously referenced study<sup>4</sup> by Dr Mary Ann Elston that provides a sturdy foundation for the future work that is recommended. Most readers will opt to read the shorter version, but the full report contains fascinating new perspectives from other professions and other countries.

The report easily puts to rest some false but widely held beliefs. Projections that women will constitute 70% of medical school entrants are not being fulfilled; the proportion seems to be stabilising at around 57-58%. Neither are men disappearing from medical schools; in fact, 50% more male medical students were admitted in 2007 than 10 years earlier. The steep rises in the numbers of both sexes make future shortages of specialty doctors, or a lack of medical leaders, most unlikely. In addition, no evidence exists that women are more likely than men to leave medicine entirely. Overall, the Royal College of Physicians report should perhaps make more of the success implicit in its statement that “the main challenge ahead is no longer barriers to entry or delays to the career progression of women . . .” Its comparisons with solicitors, dentists, vets, and pharmacists certainly suggest a less favourable situation in other professions.

The linked questionnaire study by Taylor and colleagues confirms that there is no evidence that female NHS doctors have been directly disadvantaged in their career progression, or that having children negatively affects the career progression of women who have always worked full time.<sup>5</sup>

The Royal College of Physicians report sees the new challenge as being “to ensure that the increasing proportion of women is effectively, economically, and fairly incorporated into the workforce for the benefit of patients.” Their start point is an analysis of women’s specialty choices and preferred modes of working. Specialties are categorised on the basis of their relative

orientation to technology or to people and on the unpredictability of workload. Women tend to favour people orientated specialties with more plannable workloads. This pattern, which is replicated in other Western countries, is explored in the report, and clearly links to the wish of many women to work flexibly and the need for career breaks, not least to have children. Cohort studies 15 years after graduation suggest that women doctors on average provide 75% of the service contribution of men.

The potential impact of these workforce issues on patient care and the NHS is the focus of the report’s key recommendations. The Royal College of Physicians recommends that the organisational implications of changing workforce patterns and preferences with respect to working hours and specialty choices should be examined, and their economic effect evaluated. They highlight the need for better workforce information to support this work, as well as strengthened workforce planning and modelling, which in turn should inform the career choices of young doctors.

The common sense of all this seems incontestable, but there are two serious problems. The first is that the preferences of female doctors, which the report articulates well, have to be matched with employment opportunities. The labour market for doctors looks set to become much harsher, with NHS funding strait jacketed by the worst public sector finances since the war and substantially more UK trained doctors are seeking employment as a result of recent expansion of the country’s medical schools.<sup>6 7</sup> In the current devolved NHS, decisions on the organisation of services and the employment of doctors will be taken by independent foundation trusts, and preferred options for specialty or work/life/family balance may simply not be available.

The second more prosaic problem is our poor collective track record in bringing these sorts of strategic discussions to any useful conclusion. As the report itself highlights, consideration of patterns of medical work lead immediately to questions of tiered consultant grades and the role of non-specialist career doctors, the stuff of central policy gridlock for decades.

But the problems the report highlights are difficult to tackle and will not go away, and they are better tackled nationally in a coherent way rather than piecemeal locally. NHS Employers could make a start in partnership with Medical Education England or the Academy of Medical Royal Colleges. Once established, Lord Darzi’s Centre for Workforce Excellence is an

obvious organisation to support the associated thinking and analysis.<sup>8</sup> Further work must have employers at the heart if proposals are to have a practical impact. Success will depend on their recognising the legitimate needs of their evolving medical workforce, and on doctors individually and collectively taking realistic and evidence based views of their careers.

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## Diagnosis of dementia

The usefulness of screening tests varies according to the clinical setting



BSIP/MENDIL/SPL

Although dementia is common, with an expected prevalence of 13 in 1000 in people aged 65-69 and 122 in 1000 in those over 80, only about half of those affected are diagnosed.<sup>1</sup> Without a diagnosis, patients and carers cannot access the services they need, so earlier diagnosis is a key component of the National Dementia Strategy in the United Kingdom.<sup>2,3</sup> However, early diagnosis is not easy and no definitive test exists. In the linked cross sectional study, Brown and colleagues assess the effectiveness of the "test your memory" cognitive test in detecting Alzheimer's disease. The test was designed to minimise operator time and to be suitable for non-specialists to use.<sup>4</sup>

Cognitive function in established dementia is clearly different from the cognitive changes of normal ageing, but the onset of dementia is gradual. Diagnosis requires consideration of the person's education, culture, and circumstances; dementia presents when a person's cognitive abilities are no longer adequate for them to cope with their environment. A high flying executive may experience problems early in the neuropathological process, whereas a resident of a care home may have no difficulty with his or her routine until pronounced changes have occurred. Factors including English as a second language or coexisting depression make the diagnosis even more complex.

Should we screen or case find? This is not explicit in the National Dementia Strategy, although it does seem to promote screening.<sup>5</sup> Case finding requires a high index of suspicion and assessment if the affected person or an informant expresses concern about any aspect of cognition, which usually but not always involves memory.<sup>6</sup> Other pointers may be a deterioration in personal appearance, a reduction in social roles, or when things simply "don't fit." The general practitioner may note unexplained erratic international normalised ratios in a patient whose anticoagulation was previously not problematic. In secondary care, delirium after acute illness or surgery warrants follow-up.

The diagnosis of dementia requires a detailed history from the patient and an informant, in addition to mental state examination and cognitive testing, usually in

a specialist setting. However, a quick screening test is needed in primary care and general hospital practice. The ideal test would be sensitive and specific (parameters that vary with the prevalence of dementia in the population being tested), have face validity, and have inter-rater and test-retest reliability.<sup>7</sup> It would be independent of age, sex, education, mood, culture, and language; be quick and user friendly; and have an unambiguous scoring system. The pattern of errors would discriminate between dementia types and the proforma would be readily available and free. The test should also be sensitive to change and not have a ceiling or floor. Unsurprisingly, no test fulfils all these criteria.

Different screening tests are suitable for different settings, and the plethora of tests available suggests that no one test is the best.<sup>8</sup> There is generally a trade off between brevity and performance. Shorter tests may confirm a cognitive problem that needs to be evaluated, whereas longer tests contribute more to the diagnosis. The "worried well" can be reassured, but people with "mild cognitive impairment" need a management plan.<sup>9</sup>

The appeal of Brown and colleagues' test is that it is designed to be self administered, so a range of cognitive domains can be assessed with little demand on the clinician's time.<sup>4</sup> However, five of the 50 points relate to the amount of help needed to complete the test, so some assessor input is needed. In the diagnosis of early Alzheimer's disease, with a cut-off point of  $\leq 43/50$ , it had good sensitivity (92%), specificity (84%), and inter-rater reliability, and it was more sensitive than the mini-mental state examination (92% v 54%) in their population. The authors do not comment on the ethnicity of the study participants, but the local population is mainly white. Some of the items probably show cultural bias (labelling a man's suit would not be a fair test for a Bangladeshi woman) and dating the first world war has been criticised in the abbreviated mental test score, but the authors promise a range of modified tests. People with visual impairment may have difficulty doing the test.

Where will this test be useful in clinical practice? Recommended tests in primary care include the general practitioner assessment of cognition, the memory

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impairment screen, and the mini-cognitive assessment instrument.<sup>10</sup> General practitioners are likely to continue to use these briefer scores. The abbreviated mental test is still used despite its limitations. The British Geriatrics Society recommends the mini-mental state examination with CLOX1, an executive clock drawing test where the subject draws a clock in response to verbal commands, and the informant questionnaire on cognitive decline in the elderly.<sup>11</sup> However, this last test is affected by depression in the informant and the quality of the relationship between the patient and the informant. Clock drawing tests, such as CLOX1, screen for several cognitive functions rapidly and unobtrusively, but an important detractor is the multiplicity of scoring methods.

The most commonly performed test is the mini-mental state examination, which is used in research and clinical settings; test results are used as a guide to starting and monitoring treatment with anticholinesterase inhibitors in England.<sup>12</sup> Longer scales are used in specialist settings, but the test your memory test is not designed to replace these.<sup>8,9</sup>

If the test your memory test is to be adopted more widely it must be validated in a range of settings and different populations. Until then, the most important message is that clinicians should identify a test that suits their clinical setting, use it to screen or case find as appropriate,

and develop experience in its use to improve the identification of patients with early dementia.

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## Genetic discrimination in Huntington's disease

Is more often related to family history than genetic testing

### RESEARCH, p 1431

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Predictive testing for Huntington's disease was introduced in the late 1980s. It was offered reluctantly, however, because of the lack of treatment available for identified gene carriers and the potential for genetic discrimination—that is, the unfair and inappropriate treatment of a person or group on the basis of genetic information. In the linked cross sectional survey, Bombard and colleagues assess the nature and prevalence of genetic discrimination in a cohort of asymptomatic genetically tested and untested people at risk for Huntington's disease.<sup>1</sup>

Genetic testing gives people at risk the opportunity to take more responsibility and control over their lives, their health, and their future. Aren't these major aims in health care? In general, the test brings relief from uncertainty and more control over people's future lives,<sup>2</sup> and no serious adverse consequences have been reported.<sup>3</sup>

International guidelines on genetic testing for Huntington's disease have been used as a template for testing programmes for many other hereditary conditions.<sup>4</sup> Predictive testing and confirmative diagnosis by testing for mutations are now widely accepted in most medical specialties. The potential for genetic discrimination has been described extensively, but verified case reports are scarce.<sup>5</sup> Some anecdotal instances of genetic discrimination have occurred, including one of a genetically untested woman in Germany who was refused employment as a teacher because of a family

history of Huntington's disease, which received worldwide publicity.<sup>6</sup>

Bombard and colleagues surveyed 233 genetically tested and untested asymptomatic people at high risk of Huntington's disease in Canada. They found that 40% of the respondents had concerns about genetic discrimination.<sup>1</sup> However, having a family history of Huntington's disease, not genetic testing, was the main reason for genetic discrimination. This agrees with an Australian survey, which showed that only 10% of people attending clinical genetics services reported incidents of alleged negative treatment associated with the results of genetic testing, with most of these incidents being related to insurance.<sup>7</sup> Fortunately, many countries have adopted legislation or made other arrangements to prevent or discourage the misuse of genetic information for employment and insurance purposes; for example, in May 2008 the United States brought into force the genetic non-discrimination act.

In the Netherlands, clinical geneticists discuss employment and insurance with the client in the pre-test counselling sessions, but only a few clients are concerned that genetic information may be used by insurers to deny, limit, or cancel health insurance, and by employers to discriminate in the workplace.<sup>8</sup> If appropriate, people arrange their affairs with regard to insurance and employment before the test results are disclosed to them. Moreover, most people find that

concerns about employment and insurance are of minor importance compared with the main reasons for testing. People mainly want to be tested to find out if they are at risk of developing the disease and passing the mutation on to future offspring. If the test is positive they can then opt for preventive management options such as in the case of hereditary forms of cancer or cardiovascular disease.

One of the most intriguing findings in the self reports of genetic discrimination relates to the perception of discrimination within the family and social relationships, and the association with family history. In this context perception may deviate from reality. Huntington's disease profoundly affects family members, and has usually impinged on family life over more than one generation. This frame of reference certainly influences the perception of the disease, and the recall and perception of emotional or even traumatic experiences, and it may subsequently affect reports of genetic discrimination.

Clinical experience shows that people may project their fears and anger on to others. The child of a father who developed Huntington's disease half way through his professional career may have witnessed his increasing problems at the workplace and his subsequent reactions of annoyance and shame. But the child may also have noticed the father's denial, his unwillingness to make adjustments with regard to the content of work, and his rejection of the employer's support and efforts to make appropriate adjustments. Strong feelings of loyalty towards the father may result in the perception of discrimination. More insight is therefore needed into the dynamics of family and social discrimination.

We also need to verify the prevalence of genetic discrimination in relation to employment, insurance, and social relationships.<sup>5</sup> Bombard and colleagues rightly argue that legislation cannot be used to regulate interactions within social relationships. But the question of how to deal with this remains unanswered. The authors suggest that education and support programmes might help. In addition, better insight into the psychodynamics of genetic discrimination might lead to the development of appropriate intervention strategies.

Clinical geneticists and lay organisations must also continuously educate employers, insurance companies, politicians, policy makers, and the general public about the mechanisms and effects of genetic discrimination.

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## Interaction of malaria and HIV in Africa

Is well known at a biological and health systems level, but often ignored

Malaria and HIV/AIDS are two of the most important infectious diseases worldwide, accounting for almost 9% of the total burden of disease in sub-Saharan Africa.<sup>1</sup> There is good evidence of a biological interaction between them, but their combined impact on health systems is even more substantial, especially in Africa. This is often ignored.

Evidence for a biological interaction in people who are co-infected has grown. Until 1998 there was "no convincing evidence for an interaction between malaria and HIV."<sup>2</sup> By 2006 it was estimated that the interaction of malaria and HIV in one Kenyan district alone had caused 980 000 excess malaria episodes and 8500 excess HIV infections since HIV's emergence in the 1980s.<sup>3</sup> Malaria is more common and severe in adults with HIV, pregnant women, and children.<sup>4</sup> HIV viral load is greater in women with placental malaria, and infants born to women with both HIV and placental malaria are at greater risk of premature delivery, low birth weight, or death compared with infants born to women with HIV infection alone. Malaria causes increased HIV viral load in blood and breast milk

and reduced CD4 cell count.<sup>4</sup> Malaria treatment is less effective in non-pregnant adults with HIV.<sup>5</sup>

Nonetheless, research into malaria and HIV continues to be largely separate. A global policy document about co-infection with malaria and HIV was released by the World Health Organization in 2005,<sup>1</sup> but little has been done since, and other potential biological interactions have rarely been properly assessed.

Although the biological interaction between malaria and HIV is becoming increasingly evident, what is the interaction at health systems level? Worldwide, malaria and HIV/AIDS prevention and control programmes are being scaled up because of a welcome increase in support for both diseases. However, operational malaria and HIV/AIDS programmes continue to be planned separately, despite having a substantial impact on one another. One of the impacts is on human resources. In Africa and to a lesser extent in Asia and Latin America, the shortage of experienced healthcare staff means that the same health personnel are expected to deliver the scaled up programmes for both diseases, yet there is seldom joint planning.

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The diagnostic strategy needs to be coordinated. Diagnosis of acute febrile illness is made more complex for each disease by the fact that the other is common. Presentations of HIV related bacterial disease and malaria can be very similar in adults and children, yet this is often ignored in expert guidance. Meningitis, non-typhi salmonella, and pneumonia can all be misdiagnosed as malaria. Diagnostic strategies designed by malaria experts commonly insist that all fever is treated as malaria; similarly, strategies designed by HIV specialists fail to mention malaria. This is potentially damaging and a missed opportunity. For example, adults presenting with malaria often have a greater HIV seroprevalence than the general population. Even if malaria is suspected in those patients, it provides a good opportunity to promote HIV testing and counselling.<sup>6</sup>

Preventive strategies used for one disease are also often planned without regard for the other, although the impact can be positive or negative depending how it is deployed. Co-trimoxazole, a drug used to treat and prevent opportunistic infections in patients with HIV, reduces the risk of clinical malaria in adults and children infected with HIV by 70% if given alone,<sup>7</sup> and up to 95% when combined with antiretroviral drugs and use of bednets treated with insecticide.<sup>8</sup> In many operational settings cotrimoxazole has replaced intermittent preventive therapy with sulphadoxine-pyrimethamine in pregnant women with HIV despite there being no published data on the efficacy of the drugs in preventing placental malaria.

The risk of interactions between drugs for the two diseases has only recently begun to be tackled, albeit current evidence indicates dangerous interactions between antiretrovirals and some artemisinin based combination treatment for malaria.<sup>5</sup> Thus, a high risk of neutropenia was seen in HIV infected children receiving antiretrovirals and amodiaquine-artesunate.<sup>9</sup> The relatively high rates of non-malarial causes of fever in people with HIV combined with a reduction in the risk

of malaria with cotrimoxazole prophylaxis imply that presumptive treatment for malaria should be avoided in African adults with HIV or children with HIV who take cotrimoxazole prophylaxis until we know more.

These are just some examples of the interactions between malaria and HIV in pregnant and non-pregnant adults and in children in Africa at biological, case management, and health systems levels. It is time for the development of a comprehensive operational research and policy strategy to tackle key knowledge gaps regarding malaria and HIV co-infection. In the context of continuing availability of resources this in turn will support the integration of interventions for both diseases, maximising their impact and cost effectiveness. Health systems can then be strengthened rather than overloaded within the typically “vertically” managed worlds of malaria and HIV/AIDS prevention and control.

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## A model for NICE in the US

Will provide data on comparative efficacy and cost-effectiveness to improve health care

The US Congress has recently allocated \$1.1bn (£0.68bn; €0.78bn) for research to compare the effectiveness of different treatments.<sup>1</sup> As McGreal explains,<sup>2</sup> some groups fiercely oppose the plans. Conservatives for Patient Rights (CPR) argue that “choice, competition, accountability and personal responsibility” should determine better health care. Spokesmen from the pharmaceutical industry have tried to discredit the investigation of cost effectiveness, which “puts a ceiling on price and can limit the treatment options for patients. Critics have faulted the UK National Institute for Health and Clinical Excellence (NICE) for that.” One UK

critic of NICE, Karol Sikora (medical director of CancerPartnersUK), is quoted as saying: “As a practicing oncologist, I am forced to give patients older, cheaper medicines. The real cost of this penny-pinching is premature death for thousands of patients—and higher overall health costs than if they had been treated properly: sick people are expensive.” Should Americans welcome cost effectiveness analysis?

Health care is certainly expensive in the United States. Expenditure in 2005 was \$6350 per US citizen (45% publicly financed) compared with \$2597 per UK citizen (87% from public funds).<sup>3</sup>

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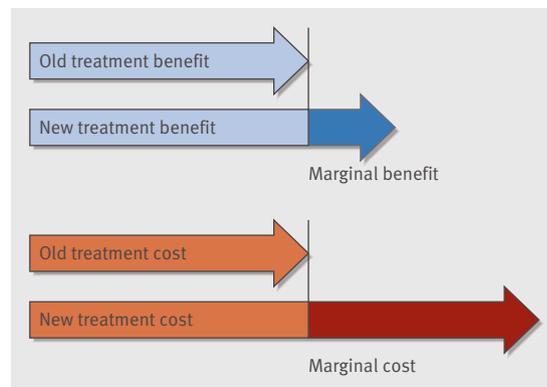
This disparity is not matched by a disparity in health. In 2009, UK citizens are predicted to live on average one year longer than US citizens, and the health of white, middle aged Americans was worse than that of the English in every socioeconomic class.<sup>4</sup> Many Americans are denied any choice by virtue of being uninsured—45.7 million (15.3% of the population) in 2007.<sup>5</sup> Even those who are insured are being asked to contribute more in co-payments and, as a consequence, are reluctant to start chronic therapy.<sup>6</sup> Private health care is readily available to UK citizens who choose to spend their money on it, but most rely on the NHS.

Resources for health care are limited, even in the US. The “tragedy of the commons” is that individuals can make choices that are rational for themselves but lead to the destruction of resources held in common. Hardin described it in terms of animals grazing on common land,<sup>7</sup> but over-fishing and deforestation are also examples. In the same way, resources in the NHS and health insurance schemes are limited. Patients who wish to have treatments for themselves,<sup>8</sup> and doctors—including oncologists—who seek to command resources for their own patients,<sup>9</sup> reduce the chances of others having treatment. Money spent buying pemetrexed for non-small cell lung cancer (which NICE did not recommend) could be spent buying an order of magnitude more health gain for middle aged women at risk of osteoporotic fracture treated with alendronic acid (which NICE recommended).

We know this from cost-effectiveness analysis, which establishes whether one treatment is better than another, and if so, by how much—the marginal benefit—and how much has to be paid for the additional benefit—the marginal cost (see figure). For the past decade, NICE’s appraisal committees have been considering evidence from industry, doctors, and patients, and using it to provide independent estimates of cost effectiveness for the NHS.<sup>10</sup> NICE compares the marginal benefit, measured (perhaps imperfectly) in quality adjusted life years (QALYs), and the marginal cost, in terms of money paid by the NHS and social services.

Treatments can be compared for different conditions. NICE generally accepts those interventions with a cost per QALY less than £20 000 as representing good value for the NHS. While it may also recommend other treatments, the chances of recommendation diminish as the cost per QALY increases. Once NICE has recommended a treatment, the NHS undertakes to fund it. NICE has endorsed full or restricted use for 84% of the treatments it considered, and encouraged research on a further 6% (Rawlins MD, NICE, personal communication).

NICE may decline to recommend costly treatments that bring tiny benefits—such as pemetrexed, which costs over £50 000 per QALY but adds a statistically non-significant 12 days to life expectancy in non-small cell lung cancer. Any unfavourable decision allows critics to deploy poignant tales of personal tragedy,<sup>11</sup> often with exaggerated statements



Cost effectiveness establishes how much extra has to be paid for extra benefit. It can be expressed as the ratio of marginal cost to marginal benefit—the incremental cost effectiveness ratio (ICER)

of potential health gain, without the counterbalance of tragic stories ensuing from unmet need elsewhere. The US initiative needs to provide data to support moves away from treatments that bring small marginal benefits for huge marginal costs and which fuel rapidly escalating healthcare spending without corresponding improvements in health. Market forces have failed to contain health expenditure in the US or to direct it towards effective treatments.<sup>12</sup> This is partly because sensible decisions on medical care, whoever makes them, require information on comparative efficacy and cost effectiveness. The most useful data are unbiased, directly measured, and relevant to the individual. NICE represents the closest current approach to these ideals, and other countries have followed the UK’s lead.

Sir William Beveridge, who in 1942 set out the blueprint for the NHS, wrote: “The first principle is that any proposals for the future, while they should use to the full the experience gathered in the past, should not be restricted by consideration of sectional interests established in the obtaining of that experience.” Sectional interests are trying to defeat long overdue healthcare reform in the US, as they have tried to outflank NICE in the UK.

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